

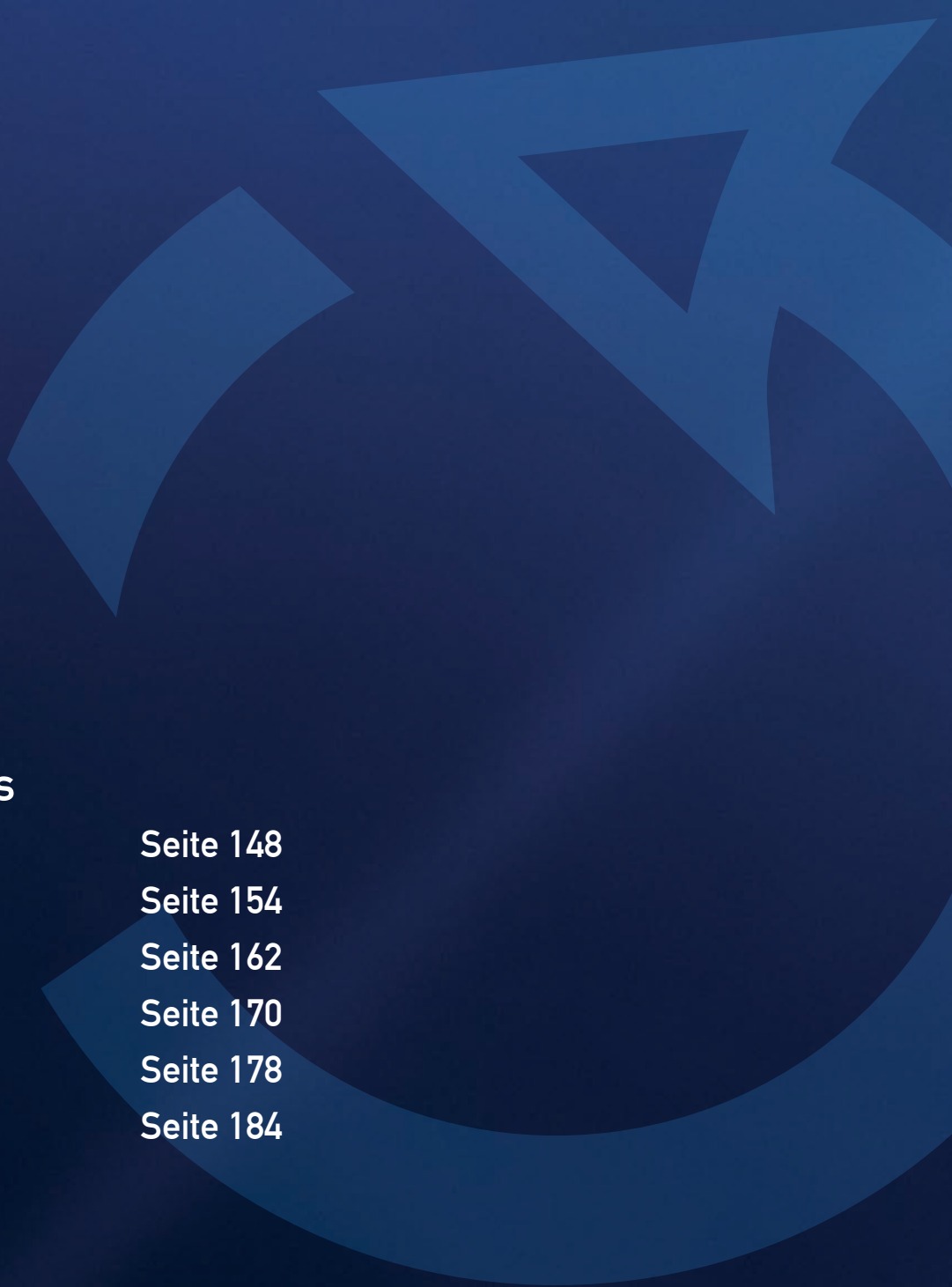
EC-Motors

Brushless motors

The brushless drives of the ECM-series (ECM = Electronically Commutated Motor) are available in the standard versions at KAG ex warehouse.

As basis models, the EC-motors offer versatile application solutions and drive combinations. An overview of the various adaptation possibilities can be found from page 192 onwards.

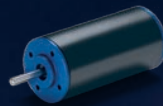




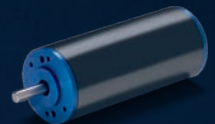
EC-Motors

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Overview EC-standard motors



ECM35



ECM42

		x 20/l	x 30/l	x 15/l	x 30/l
Ident. no.		230543	230544	230528	230527
Voltage		12	24	24	24
Torque		2,5	4	4	9
Speed		3800	3600	3500	3200
Weight [kg]		0,25 – 0,30		0,30 – 0,50	
Length [mm]		62 – 72		70 – 100	
shaft diameter [mm]		4g5		6g5	
shaft length [mm]		20		20	
Planetary gearboxes	PKS30				
	P32I	8 - 450 Ncm	13 - 450 Ncm	13 - 450 Ncm	29 - 450 Ncm
	P42I	8 - 616 Ncm	13 - 862 Ncm	13 - 862 Ncm	29 - 1500 Ncm
	P52I			13 - 862 Ncm	29 - 1940 Ncm
	P62I				
	P72I				
	P82I				
Worm gearboxes	SN17			21 - 75 Ncm	47 - 169 Ncm
	SN22,6			9 - 54 Ncm	21 - 122 Ncm
	SN31				
	SN40				
Spur gearboxes	S1				
	S5			29 - 500 Ncm	66 - 500 Ncm
	S90			61 - 586 Ncm	138 - 900 Ncm
	S92				
Optical encoder	IGO RU	x			
	IGO				x
	IGO SN				x
Magnetical encoder	IGM	x			x
	IGM 8-1024				x
Brakes	B37	x			x
	B47				x
	B56				
	B60				
Integrated commutation electronics	i42				x
	i63				



ECM48

x 45/l	x 20/l	x 40/l	x 60/l
230488	230546	230547	230548
24	24	24	24
13	6	16	23
3100	3050	3550	3550
	0,45 – 0,85		
	80 – 120		
	6g5		
	20		
42 - 450 Ncm			
42 - 1500 Ncm	19 - 1294 Ncm	51 - 1500 Ncm	74 - 1500 Ncm
42 - 2500 Ncm	19 - 1294 Ncm	51 - 2500 Ncm	74 - 2500 Ncm
68 - 244 Ncm			
31 - 177 Ncm	14 - 82 Ncm	38 - 218 Ncm	55 - 313 Ncm
	50 - 105 Ncm	134 - 280 Ncm	193 - 400 Ncm
95 - 500 Ncm	44 - 500 Ncm	117 - 500 Ncm	168 - 500 Ncm
200 - 900 Ncm	92 - 879 Ncm	246 - 900 Ncm	354 - 900 Ncm
		x	
		x	
		x	
		x	
		x	
		x	
		x	

Overview EC-standard motors



ECM63

		x 20/l	x 40/l	x 60/l	x 20/l
	Ident. no.	230532	230531	230493	230001
	Voltage	24	24	24	24
	Torque	12	30	40	12
	Speed	2900	2600	2850	2750
	Weight [kg]	0,80 – 1,55			
	Length [mm]	90 – 130			
	shaft diameter [mm]	8g5			
	shaft length [mm]	25			
Planetary gearboxes	PKS30				
	P32l				
	P42l				
	P52l	38 - 2500 Ncm	96 - 2500 Ncm	128 - 2500 Ncm	38-2500 Ncm
	P62l	38 - 2587 Ncm	96 - 5000 Ncm	128 - 5000 Ncm	38-2587 Ncm
	P72l				
	P82l				
Worm gearboxes	SN17				
	SN22,6				
	SN31	101 - 210 Ncm	252 - 400 Ncm	336 - 400 Ncm	101-210 Ncm
	SN40	101 - 210 Ncm	252 - 525 Ncm	336 - 700 Ncm	101-210 Ncm
Spur gearboxes	S1				
	S5				
	S90				
	S92	146 - 806 Ncm	365 - 1500 Ncm	486 - 1500 Ncm	146-806 Ncm
Optical encoder	IGO RU				
	IGO		x		
	IGO SN		x		
Magnetical encoder	IGM		x		
	IGM 8-1024		x		
Brakes	B37				
	B47				
	B56		x		
	B60		x		
Integrated commutation electronics	i42				
	i63		x		



ECMa63

x 40/l	x 60/l
230002	230000
24	24
22	32
3100	3300
–	
–	
–	
–	

70-2500 Ncm	102-2500 Ncm
70-4743 Ncm	102-5000 Ncm

185-385 Ncm	269-400 Ncm
185-385 Ncm	269-560 Ncm

267-1478 Ncm	389-1500 Ncm

x	
x	
x	
x	

x	
x	

x	



ECM75

x 20/l	x 40/l	x 60/l
230549	230550	230551
24	24	24
20	40	70
2750	3550	3000
1,25 – 2,30		
101,5 – 141,5		
10g5		
30		

64 - 2500 Ncm	128 - 2500 Ncm	224 - 2500 Ncm
64 - 4312 Ncm	128 - 5000 Ncm	224 - 5000 Ncm
64 - 4312 Ncm	128 - 8400 Ncm	224 - 8400 Ncm
64 - 4312 Ncm	128 - 8624 Ncm	224 - 12000 Ncm

168 - 350 Ncm	336 - 700 Ncm	588 - 1225 Ncm

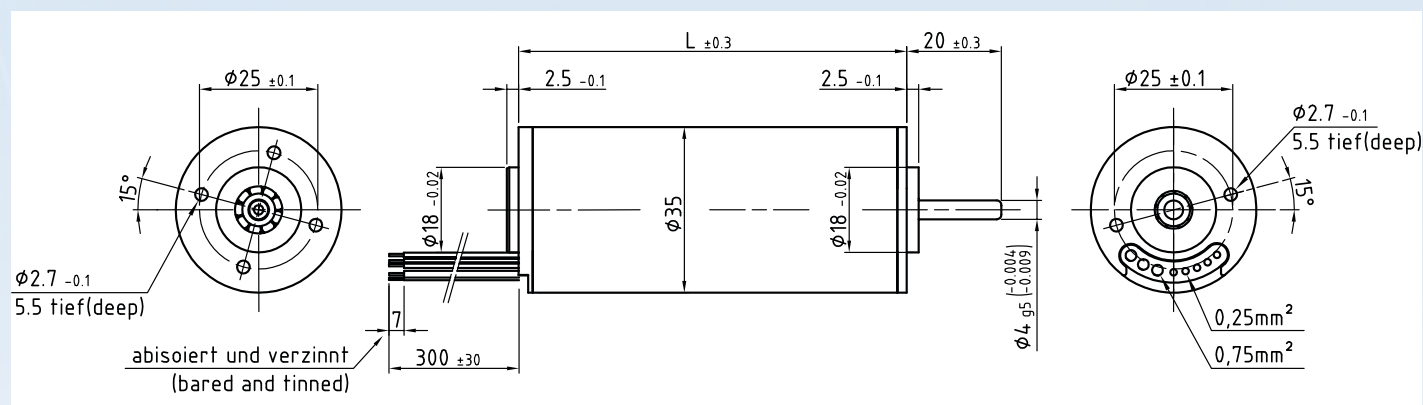
	x
	x
	x
	x

	x
	x

	x

DC-Motors Type ECM35

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120 °
- Ball bearings
- Power range in continuous operation approx. 10 to 15 watt
- Multiple combination possibilities with gears, encoders and brakes



Application on request

Versions	Unit	ECM35x20/I	ECM35x30/I
Part number	[ID]	230543	230544a
Nominal voltage	[V]	24	24
Nominal torque	[Ncm]	2.5	4
Nominal speed	[1/min]	3800	3600
Nominal current	[A]	0.75	1.08
Output power ¹⁾	[W]	9.9	15.1
Rise of M-n-characteristic	[1/min / Ncm]	840	450
Torque constant	[Ncm / A]	4.0	4.2
Rotor moment of inertia	[gcm ²]	4.6	6.2
Weight	[kg]	0.25	0.3
Length	[mm]	72	82

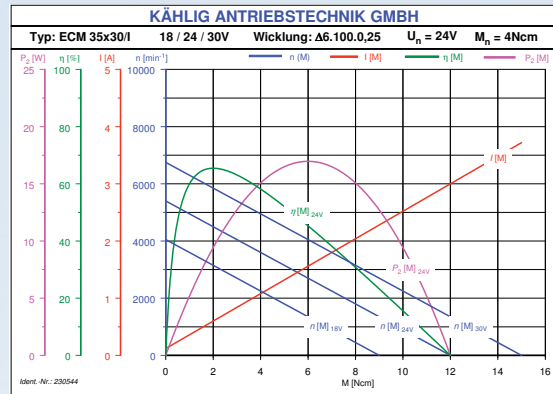
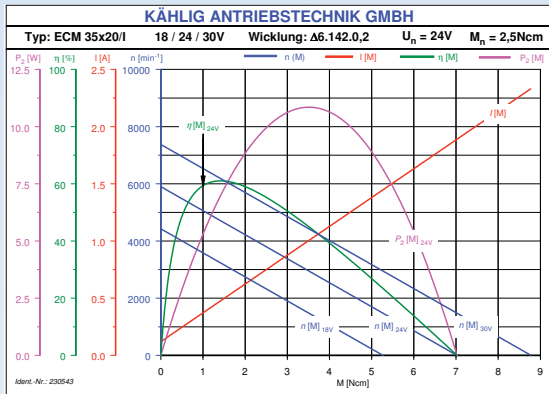
General data

Lifetime at rated torque ¹⁾	h	20000
Permissible axial shaft load ²⁾	N	30
Permissible radial shaft load ²⁾	N	80
Insulation class (DIN VDE 0530)		F
IP protection class (DIN VDE 0530)		IP 50
RFI suppression		-

1) Operation by nominal values: Date: 13.05.2008 Subject to change without notice
2) At 3000 rpm and 3000 hrs nominal life, simultaneous axial and radial loads

Stand: 10. January 2014 – changes reserved

Performance characteristics

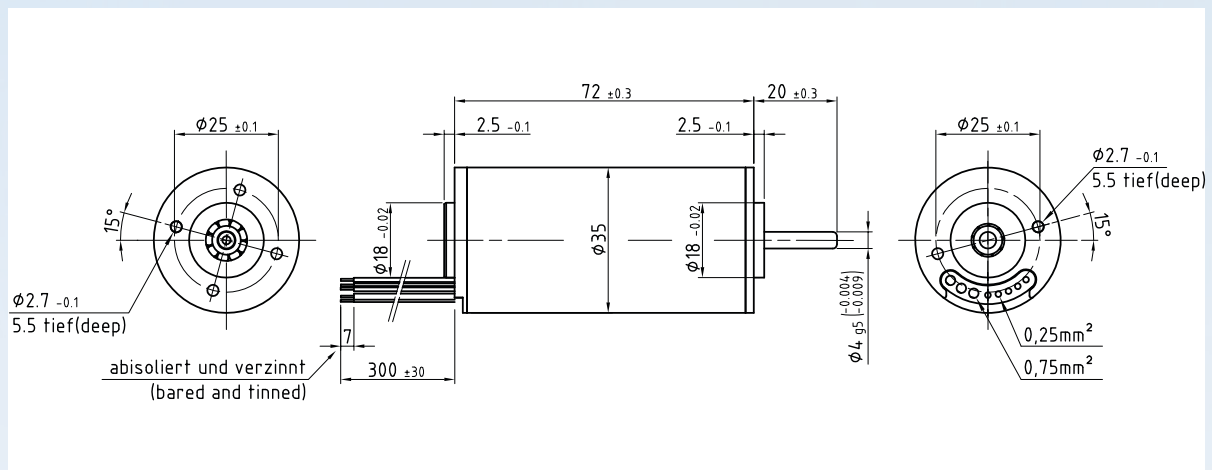


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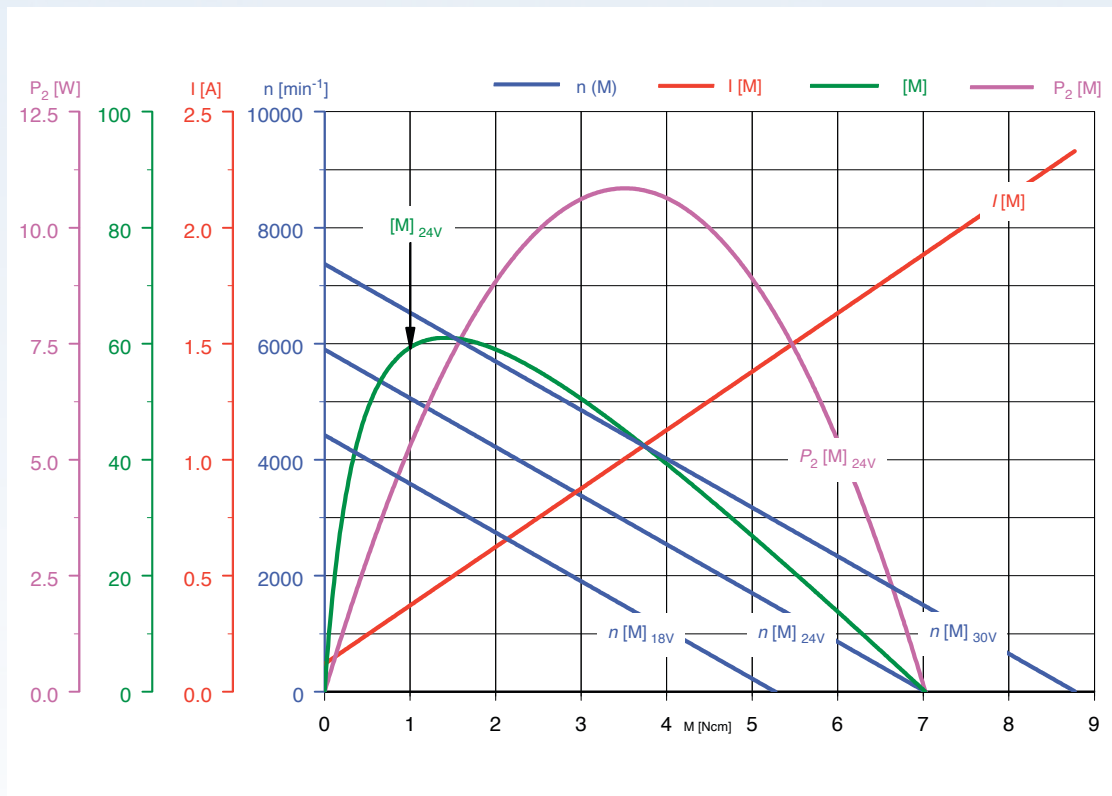
EC-Motor ECM35x20/I (24V)

Ident-Nr. 230543

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 9.9 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	2,5	
Rated speed ¹⁾	n_N	min ⁻¹	3800	±10%
Rated current ¹⁾	I_N	A	0,75	±20%
No load speed ¹⁾	n_0	min ⁻¹	5900	±15%
No load current ¹⁾	I_0	A	0,12	±50%
Rated power output ¹⁾	P_{2N}	W	9,9	
Rated power input ¹⁾	P_{1N}	W	18	
Rated efficiency ¹⁾	η_N	%	55,3	
Maximum power output ²⁾³⁾	P_{2max}	W	10,8	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	2,5	
Maximum Continuous current ²⁾³⁾	I_{max}	A	0,75	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	20000	
Stall torque ¹⁾	M_H	Ncm	7	
Stall current ¹⁾	I_H	A	1,9	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	12,7	
Stator resistance ¹⁾	R_A	Ω	9,2	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	3,87	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	840	
Torque constant ¹⁾	k_M	Ncm/A	4	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	4,1	
Friction torque ¹⁾	M_R	Ncm	-0,5	
Mechanical time constant ¹⁾	T_M	ms	2,7	
Electrical time constant ¹⁾	T_e	ms	0,3	
Rotor inertia	J_R	gcm ²	4,6	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	30	
Permissible radial shaft loads ³⁾	F_{radial}	N	80	
Protection class DIN VDE 0530	IP50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

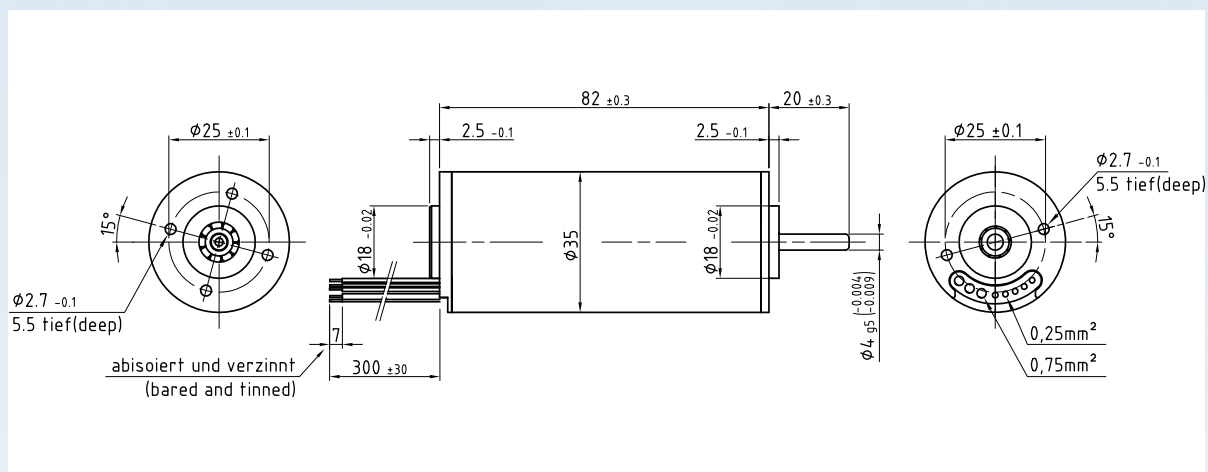
3) The operating at maximum levels reduces the lifespan

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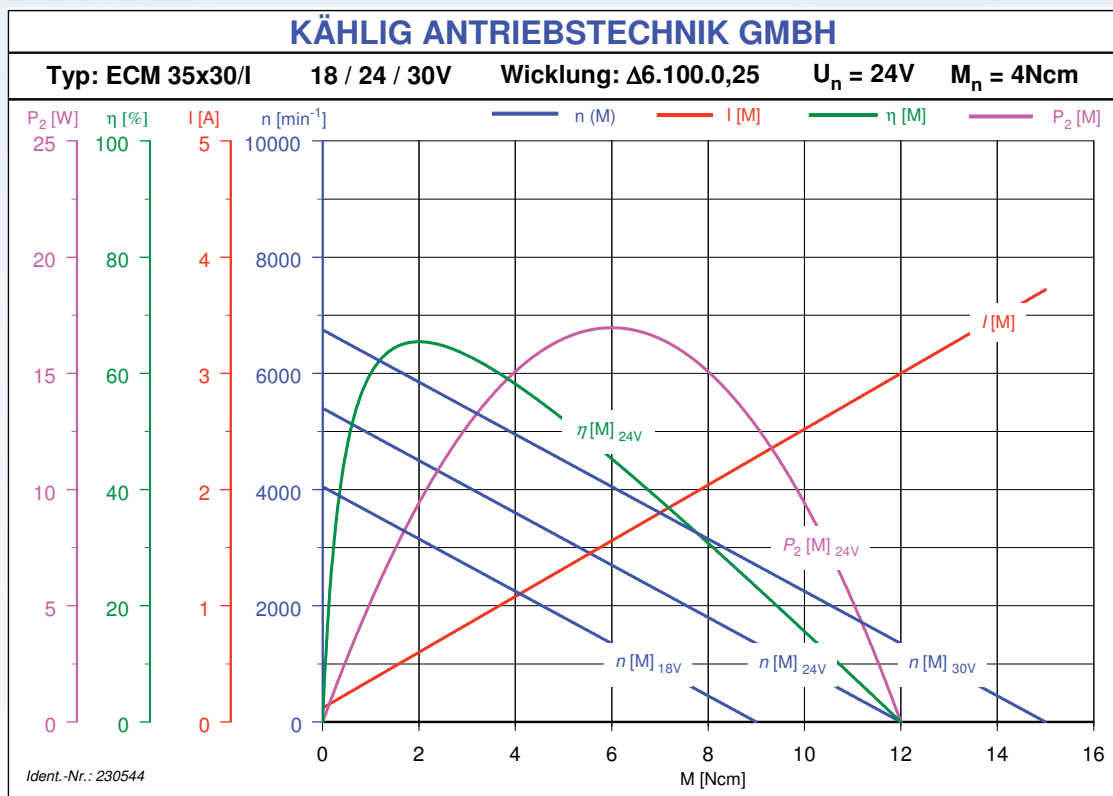
EC-Motor ECM35x30/I (24V)

Ident-Nr. 230544

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 15,1 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	4	
Rated speed ¹⁾	n_N	min ⁻¹	3600	±10%
Rated current ¹⁾	I_N	A	1.08	±20%
No load speed ¹⁾	n_0	min ⁻¹	5400	±15%
No load current ¹⁾	I_0	A	0.12	±50%
Rated power output ¹⁾	P_{2N}	W	15.1	
Rated power input ¹⁾	P_{1N}	W	25.9	
Rated efficiency ¹⁾	η_N	%	58.2	
Maximum power output ²⁾³⁾	P_{2max}	W	17	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	4	
Maximum Continuous current ²⁾³⁾	I_{max}	A	1.08	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	20000	
Stall torque ¹⁾	M_H	Ncm	12	
Stall current ¹⁾	I_H	A	3	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	8.34	
Stator resistance ¹⁾	R_A	Ω	6.15	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	2.54	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	450	
Torque constant ¹⁾	k_M	Ncm/A	4.2	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	4.4	
Friction torque ¹⁾	M_R	Ncm	-0.5	
Mechanical time constant ¹⁾	T_M	ms	2.2	
Electrical time constant ¹⁾	T_e	ms	0.3	
Rotor inertia	J_R	gcm ²	6.2	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	30	
Permissible radial shaft loads ³⁾	F_{radial}	N	80	
Protection class DIN VDE 0530	IP50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

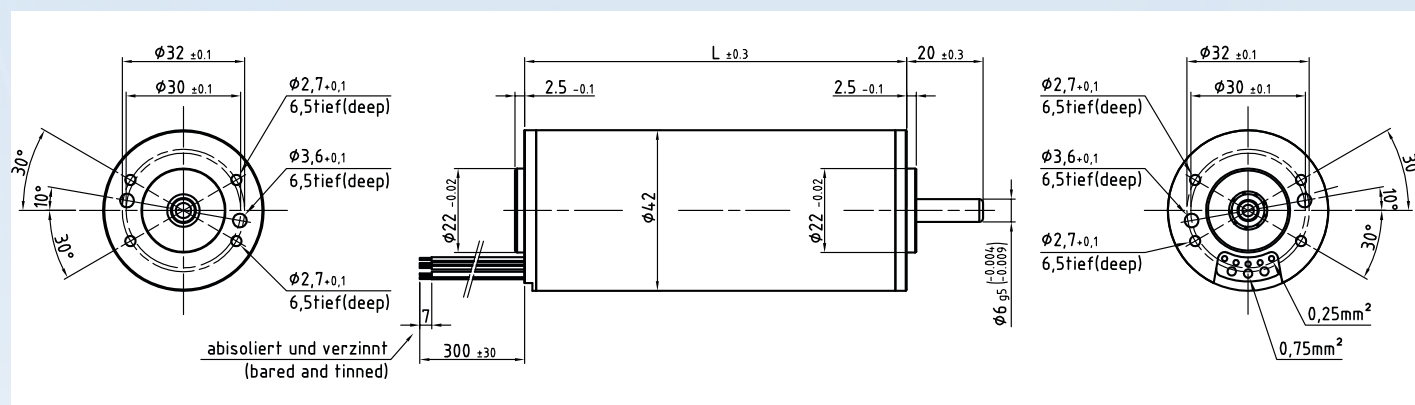
1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

3) The operating at maximum levels reduces the lifespan

Stand: 22. Januar 2015 – changes reserved

DC-Motors Type ECM42

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120 °
- Ball bearings
- Power range in continuous operation approx. 15 to 45 watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request

Versions	Unit	ECM42x15/I	ECM42x30/I	ECM42x45/I
Part number	[ID]	230528a	230527a	230488b
Nominal voltage	[V]	24	24	24
Nominal torque	[Ncm]	4	9	13
Nominal speed	[1/min]	3500	3200	3100
Nominal current	[A]	1,12	1,97	2,62
Output power ¹⁾	[W]	14,6	30,16	42,2
Rise of M-n-characteristic	[1/min / Ncm]	433,3	130,6	76,7
Torque constant	[Ncm / A]	4,3	5,2	5,6
Rotor moment of inertia	[gcm ²]	15,35	29,5	43,6
Weight	[kg]	0,3	0,4	0,5
Length	[mm]	70	85	100

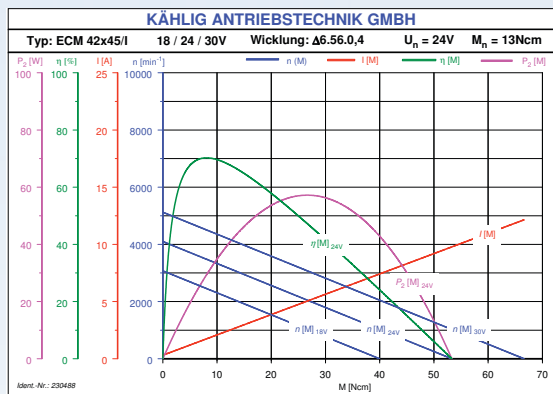
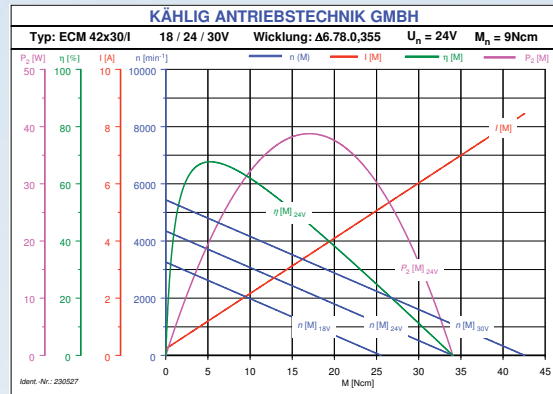
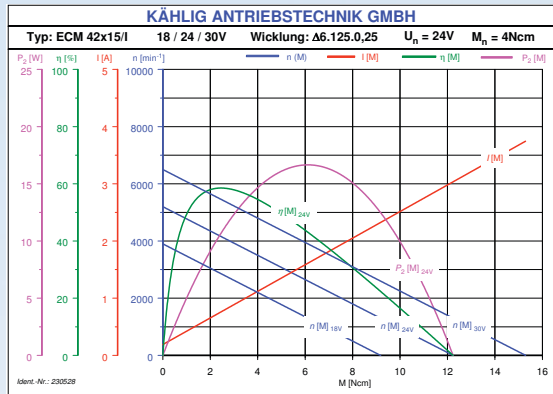
General data

Lifetime at rated torque ¹⁾	h	20000
Permissible axial shaft load ²⁾	N	40
Permissible radial shaft load ²⁾	N	100
Insulation class (DIN VDE 0530)		F
IP protection class (DIN VDE 0530)		IP 50
RFI suppression		-

¹⁾ Operation by nominal values. Date: 13.05.2008 Subject to change without notice
²⁾ At 3000 rpm and 3000 hrs nominal life, simultaneous axial and radial loads

Stand: 10. January 2014 – changes reserved

Performance characteristics

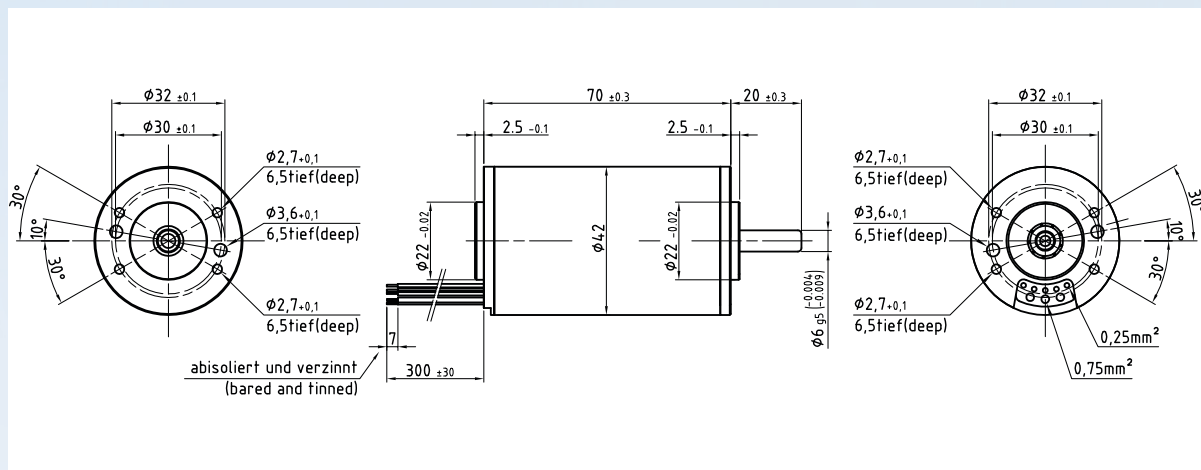


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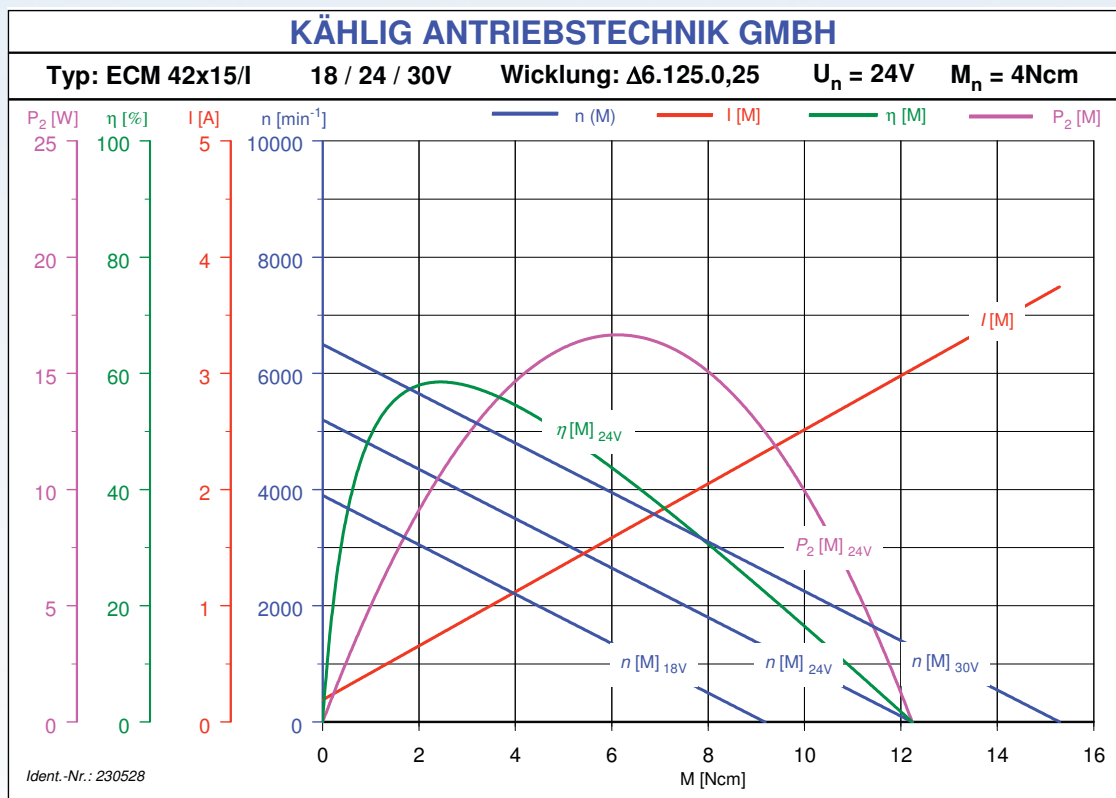
EC-Motor ECM42x15/I (24V)

Ident-Nr. 230528

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 14,6 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	4	
Rated speed ¹⁾	n_N	min ⁻¹	3500	±10%
Rated current ¹⁾	I_N	A	1,12	±20%
No load speed ¹⁾	n_0	min ⁻¹	5200	±15%
No load current ¹⁾	I_0	A	0,19	±50%
Rated power output ¹⁾	P_{2N}	W	14,6	
Rated power input ¹⁾	P_{1N}	W	26,9	
Rated efficiency ¹⁾	η_N	%	54,3	
Maximum power output ²⁾³⁾	P_{2max}	W	16,5	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	4	
Maximum Continuous current ²⁾³⁾	I_{max}	A	1,12	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	16000	
Stall torque ¹⁾	M_H	Ncm	12,1	
Stall current ¹⁾	I_H	A	3,0	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	8,03	
Stator resistance ¹⁾	R_A	Ω	5,72	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	3,21	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	433,3	
Torque constant ¹⁾	k_M	Ncm/A	4,3	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	4,6	
Friction torque ¹⁾	M_R	Ncm	-0,8	
Mechanical time constant ¹⁾	T_M	ms	4,7	
Electrical time constant ¹⁾	T_e	ms	0,4	
Rotor inertia	J_R	gcm ²	15,35	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	40	
Permissible radial shaft loads ³⁾	F_{radial}	N	100	
Protection class DIN VDE 0530	IP50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

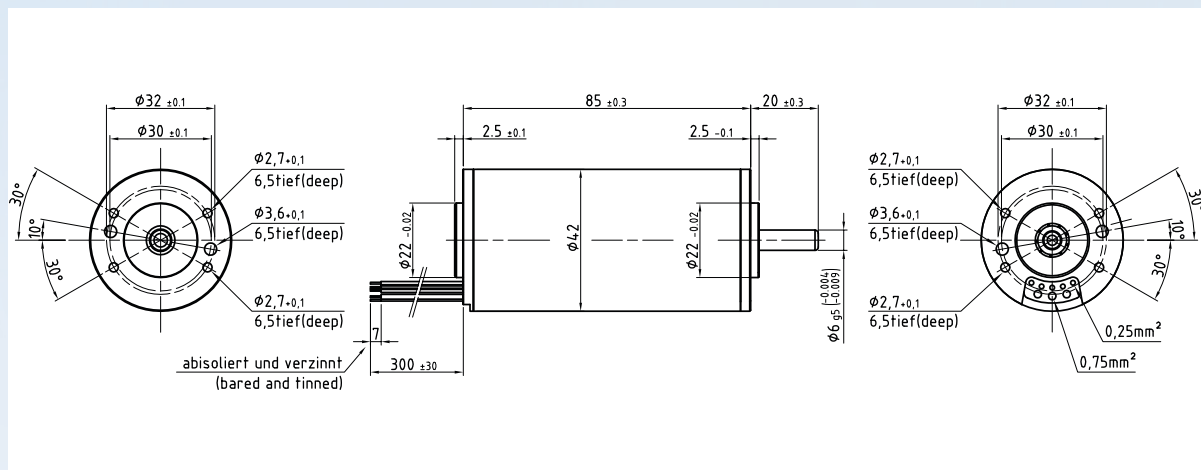
3) The operating at maximum levels reduces the lifespan

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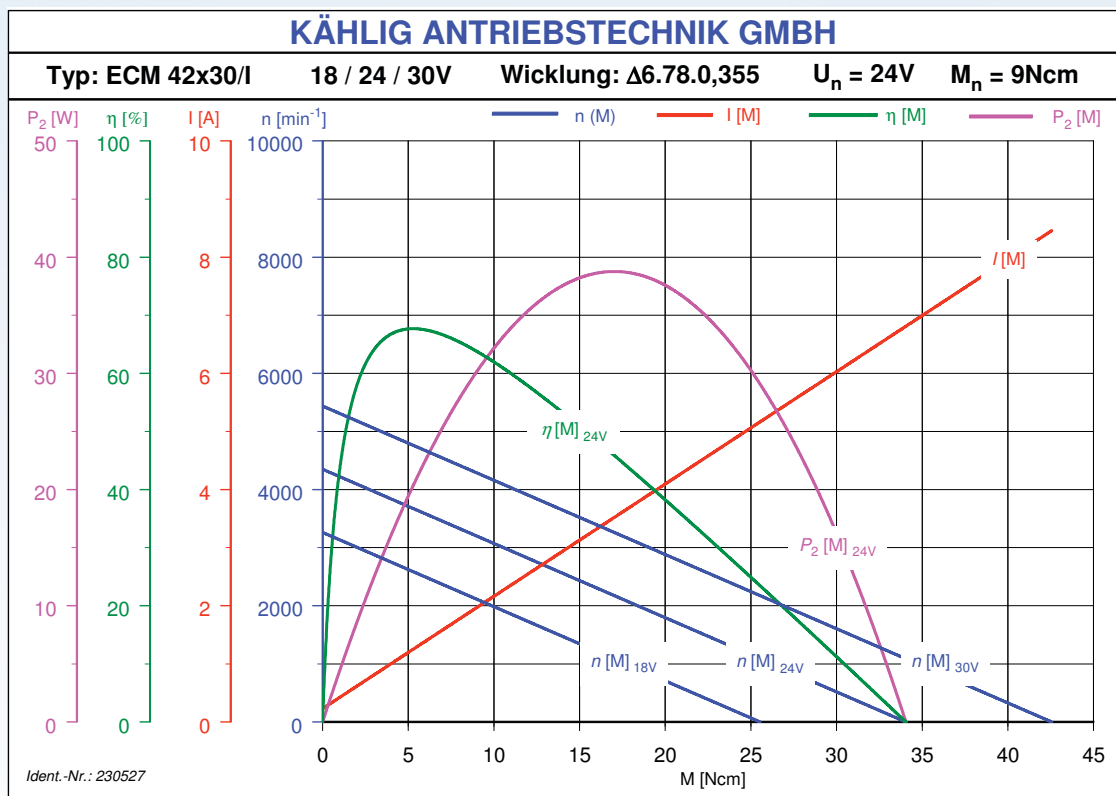
EC-Motor ECM42x30/I (24V)

Ident-Nr. 230527

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 30,2 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	9	
Rated speed ¹⁾	n_N	min ⁻¹	3200	±10%
Rated current ¹⁾	I_N	A	1,97	±20%
No load speed ¹⁾	n_0	min ⁻¹	4350	±15%
No load current ¹⁾	I_0	A	0,23	±50%
Rated power output ¹⁾	P_{2N}	W	30,16	
Rated power input ¹⁾	P_{1N}	W	47,28	
Rated efficiency ¹⁾	η_N	%	63,7	
Maximum power output ²⁾³⁾	P_{2max}	W	38,2	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	9	
Maximum Continuous current ²⁾³⁾	I_{max}	A	1,97	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	16000	
Stall torque ¹⁾	M_H	Ncm	33,4	
Stall current ¹⁾	I_H	A	6,7	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	3,58	
Stator resistance ¹⁾	R_A	Ω	2,65	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	1,63	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	130,6	
Torque constant ¹⁾	k_M	Ncm/A	5,2	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	5,5	
Friction torque ¹⁾	M_R	Ncm	-1,2	
Mechanical time constant ¹⁾	T_M	ms	2,9	
Electrical time constant ¹⁾	T_e	ms	0,5	
Rotor inertia	J_R	gcm ²	29,5	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	40	
Permissible radial shaft loads ³⁾	F_{radial}	N	100	
Protection class DIN VDE 0530	IP50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

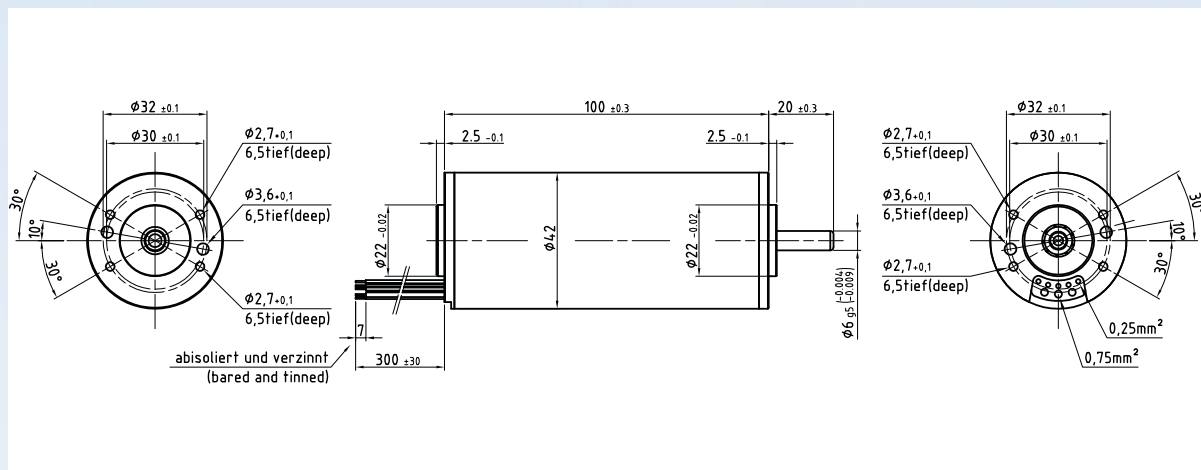
1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

3) The operating at maximum levels reduces the lifespan

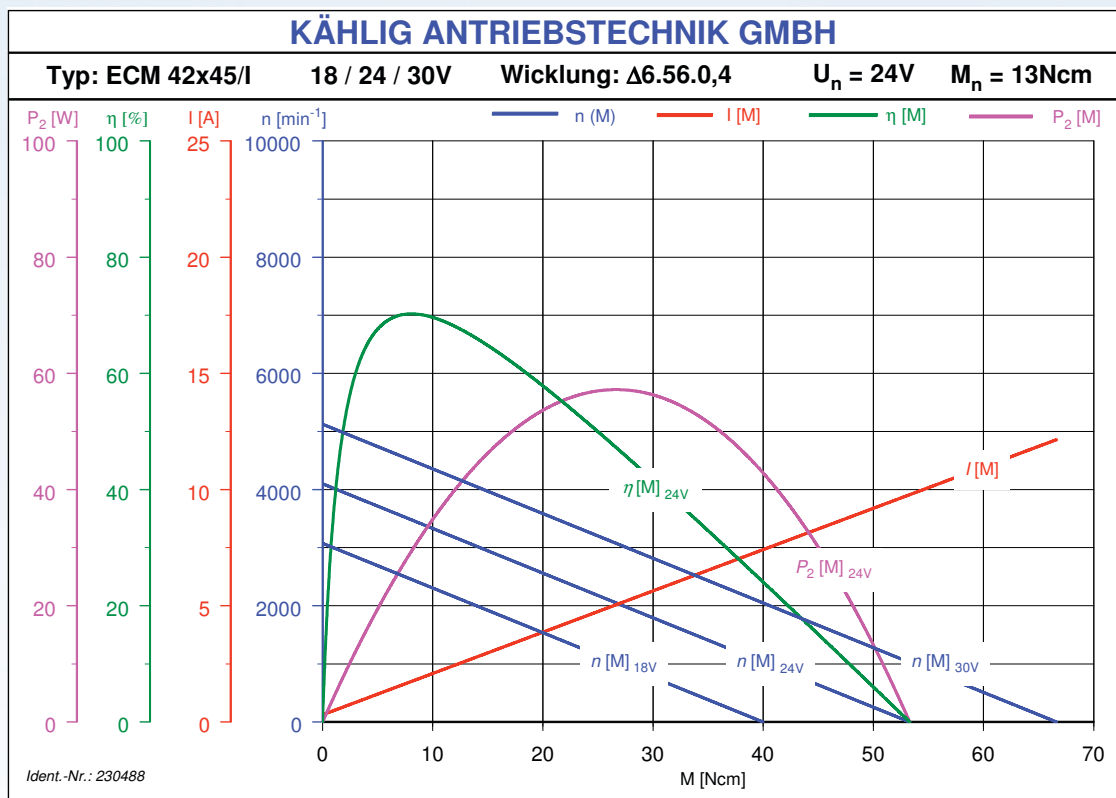
Stand: 22. Januar 2015 – changes reserved

EC-Motor ECM42x45/I (24V)
Ident-Nr. 230488

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 42.2 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	13	
Rated speed ¹⁾	n_N	min ⁻¹	3100	±10%
Rated current ¹⁾	I_N	A	2,62	±20%
No load speed ¹⁾	n_0	min ⁻¹	4100	±15%
No load current ¹⁾	I_0	A	0,31	±50%
Rated power output ¹⁾	P_{2N}	W	42,2	
Rated power input ¹⁾	P_{1N}	W	62,9	
Rated efficiency ¹⁾	η_N	%	67,1	
Maximum power output ²⁾³⁾	P_{2max}	W	57,1	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	13	
Maximum Continuous current ²⁾³⁾	I_{max}	A	2,62	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	16000	
Stall torque ¹⁾	M_H	Ncm	53,3	
Stall current ¹⁾	I_H	A	9,8	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	2,45	
Stator resistance ¹⁾	R_A	Ω	1,67	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	1,18	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	76,7	
Torque constant ¹⁾	k_M	Ncm/A	5,6	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	5,9	
Friction torque ¹⁾	M_R	Ncm	1,7	
Mechanical time constant ¹⁾	T_M	ms	2,3	
Electrical time constant ¹⁾	T_e	ms	0,5	
Rotor inertia	J_R	gcm ²	43,6	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	40	
Permissible radial shaft loads ³⁾	F_{radial}	N	100	
Protection class DIN VDE 0530	IP50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

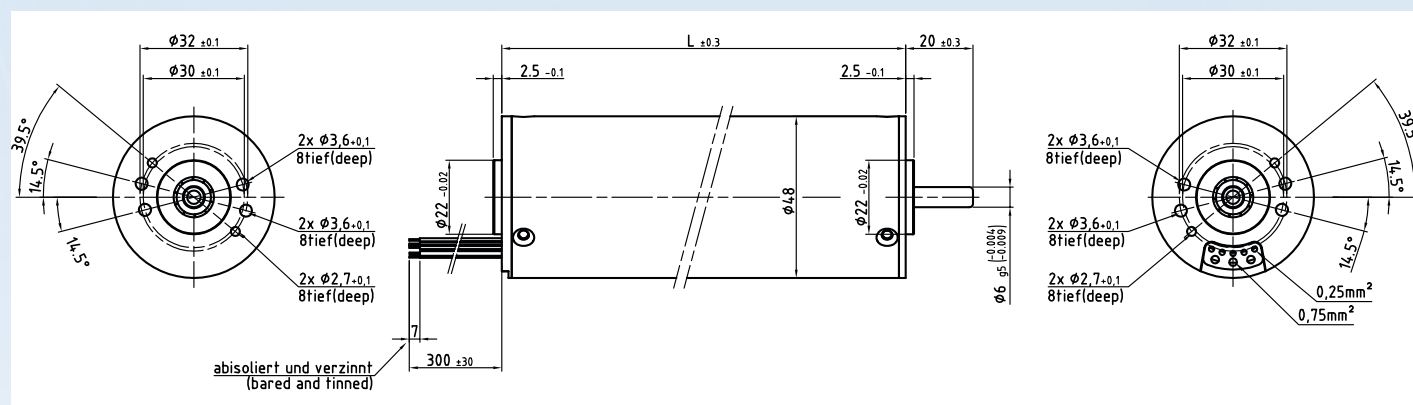
1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

3) The operating at maximum levels reduces the lifespan

Stand: 22. Januar 2015 – changes reserved

DC-Motors Type ECM48

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120 °
- Ball bearings
- Power range in continuous operation approx. 20 to 85 watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request

Versions	Unit	ECM48x20/I	ECM48x40/I	ECM48x60/I
Part number	[ID]	230546a	230547a	230548a
Nominal voltage	[V]	24	24	24
Nominal torque	[Ncm]	6	16	23
Nominal speed	[1/min]	3050	3550	3550
Nominal current	[A]	1.28	3.53	4.76
Output power ¹⁾	[W]	19.2	58.6	85.9
Rise of M-n-characteristic	[1/min / Ncm]	5.7	55	32.3
Torque constant	[Ncm / A]	6.2	5.2	5.3
Rotor moment of inertia	[gcm ²]	52	104	156
Weight	[kg]	0.45	0.65	0.85
Length	[mm]	80	100	120

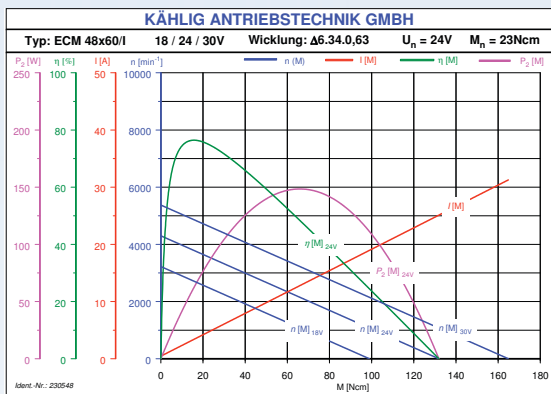
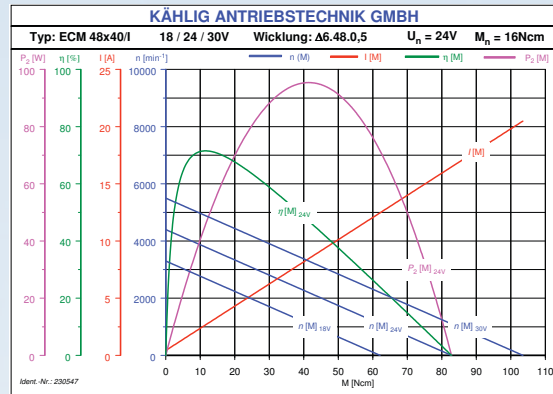
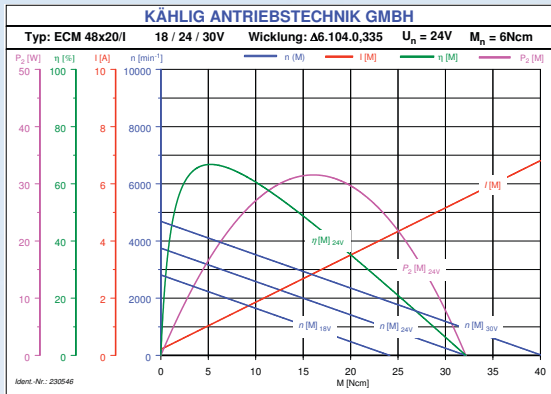
General data

Lifetime at rated torque ¹⁾	h	20000
Permissible axial shaft load ²⁾	N	40
Permissible radial shaft load ²⁾	N	100
Insulation class (DIN VDE 0530)		F
IP protection class (DIN VDE 0530)		IP 50
RFI suppression		-

¹⁾ Operation by nominal values; Date: 13.05.2008 Subject to change without notice
²⁾ At 3000 rpm and 3000 hrs nominal life, simultaneous axial and radial loads

Stand: 10. January 2014 – changes reserved

Performance characteristics

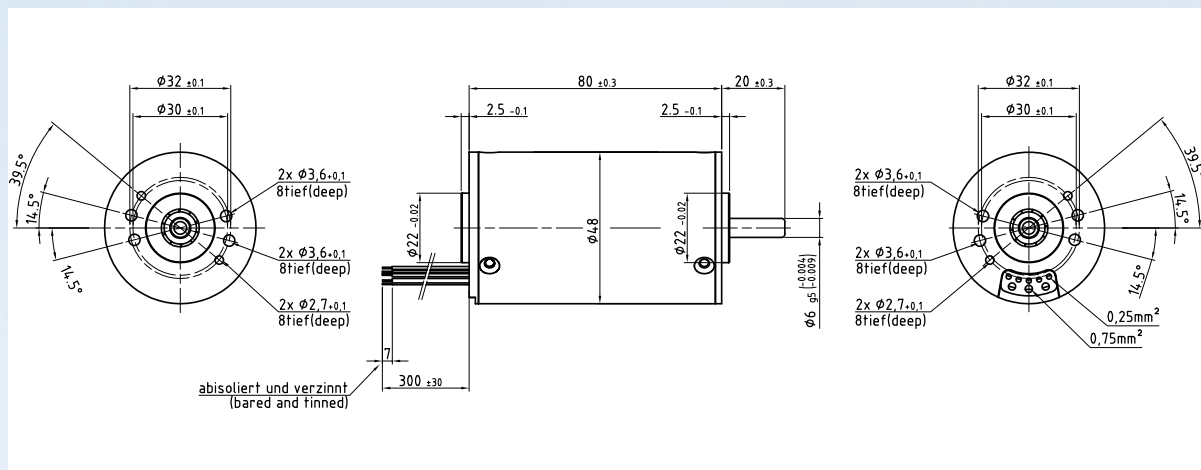


Stand: 10. January 2014 – changes reserved

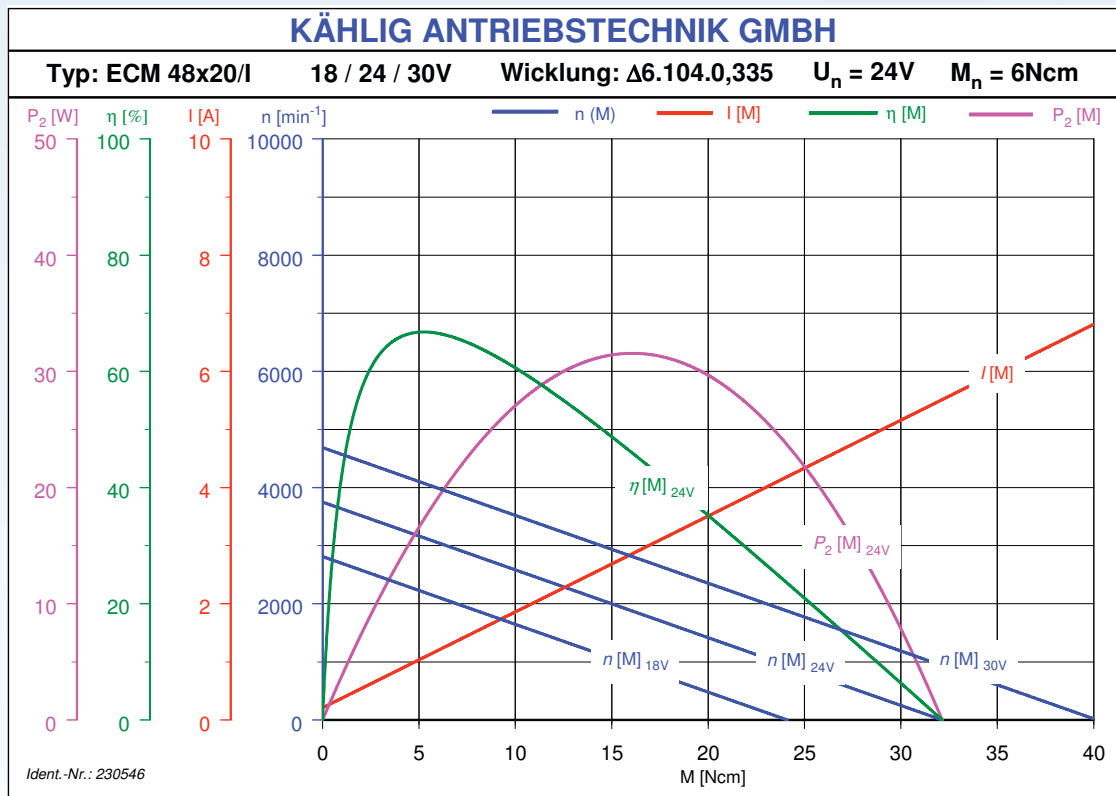
EC-Motor ECM48x20/I (24V)

Ident-Nr. 230546

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 19,2 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	6	
Rated speed ¹⁾	n_N	min ⁻¹	3050	±10%
Rated current ¹⁾	I_N	A	1,28	±20%
No load speed ¹⁾	n_0	min ⁻¹	3900	±15%
No load current ¹⁾	I_0	A	0,23	±50%
Rated power output ¹⁾	P_{2N}	W	19,2	
Rated power input ¹⁾	P_{1N}	W	30,7	
Rated efficiency ¹⁾	η_N	%	62,6	
Maximum power output ²⁾³⁾	P_{2max}	W	28,6	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	6	
Maximum Continuous current ²⁾³⁾	I_{max}	A	1,28	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	12000	
Stall torque ¹⁾	M_H	Ncm	28,1	
Stall current ¹⁾	I_H	A	5,1	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	4,67	
Stator resistance ¹⁾	R_A	Ω	3,45	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	2,17	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	138,7	
Torque constant ¹⁾	k_M	Ncm/A	5,7	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	6,2	
Friction torque ¹⁾	M_R	Ncm	-1,3	
Mechanical time constant ¹⁾	T_M	ms	5,5	
Electrical time constant ¹⁾	T_e	ms	0,5	
Rotor inertia	J_R	gcm ²	52	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	40	
Permissible radial shaft loads ³⁾	F_{radial}	N	100	
Protection class DIN VDE 0530	IP 50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

1) ϑ_w Winding temperature $\approx 20^\circ\text{C}$ 2) $\Delta\vartheta_w$ allowable = 100K

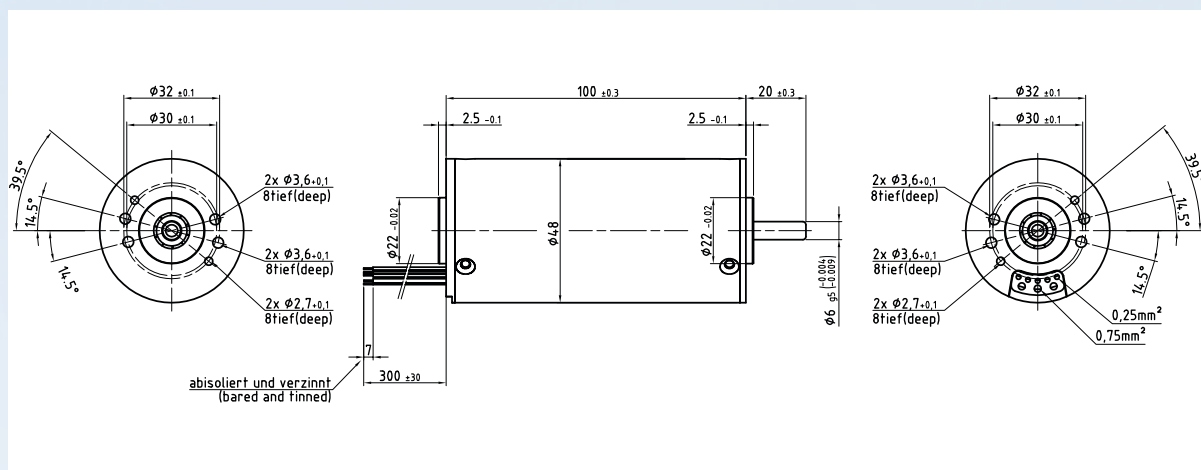
3) The operating at maximum levels reduces the lifespan

Stand: 22. Januar 2015 – changes reserved

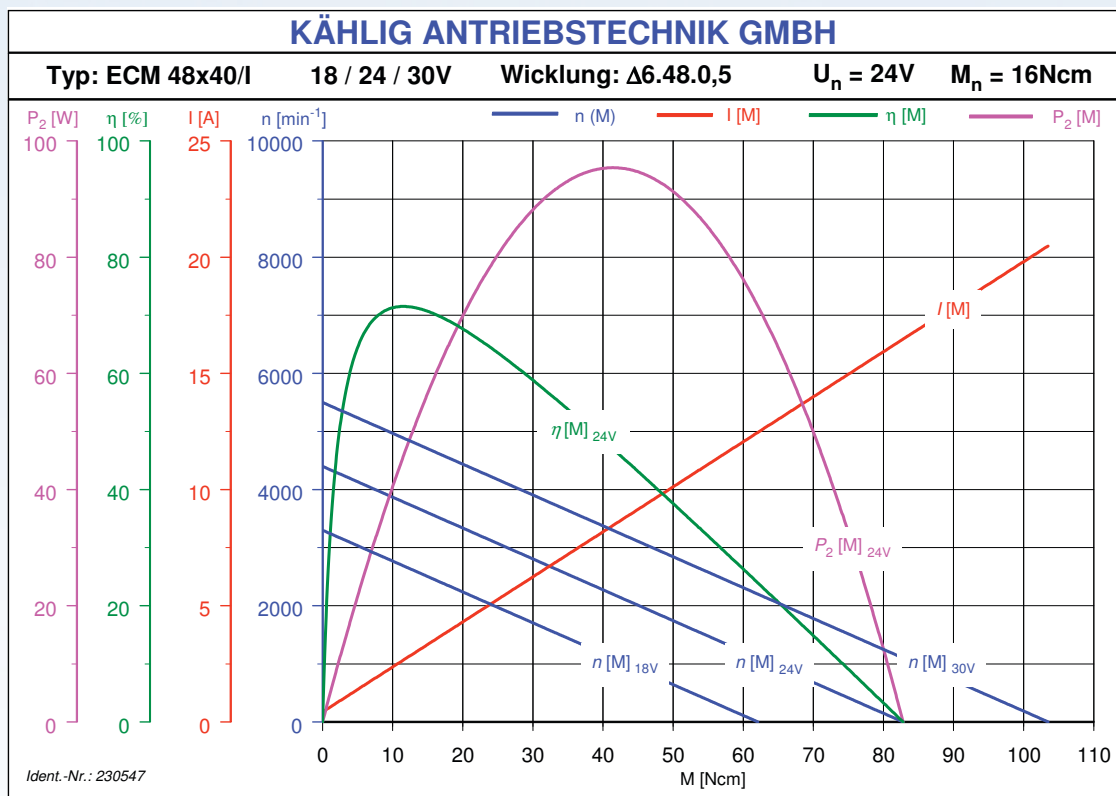
EC-Motor ECM48x40/I (24V)

Ident-Nr. 230547

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 58,6 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	16	
Rated speed ¹⁾	n_N	min ⁻¹	3550	±10%
Rated current ¹⁾	I_N	A	3,53	±20%
No load speed ¹⁾	n_0	min ⁻¹	4400	±15%
No load current ¹⁾	I_0	A	0,43	±50%
Rated power output ¹⁾	P_{2N}	W	58,6	
Rated power input ¹⁾	P_{1N}	W	84,8	
Rated efficiency ¹⁾	η_N	%	69,1	
Maximum power output ²⁾³⁾	P_{2max}	W	91,2	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	16	
Maximum Continuous current ²⁾³⁾	I_{max}	A	3,53	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	12000	
Stall torque ¹⁾	M_H	Ncm	79,6	
Stall current ¹⁾	I_H	A	15,9	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	1,51	
Stator resistance ¹⁾	R_A	Ω	0,97	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	0,79	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	55	
Torque constant ¹⁾	k_M	Ncm/A	5,2	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	5,5	
Friction torque ¹⁾	M_R	Ncm	-2,2	
Mechanical time constant ¹⁾	T_M	ms	3,8	
Electrical time constant ¹⁾	T_e	ms	0,5	
Rotor inertia	J_R	gcm ²	104	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	40	
Permissible radial shaft loads ³⁾	F_{radial}	N	100	
Protection class DIN VDE 0530	IP 50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

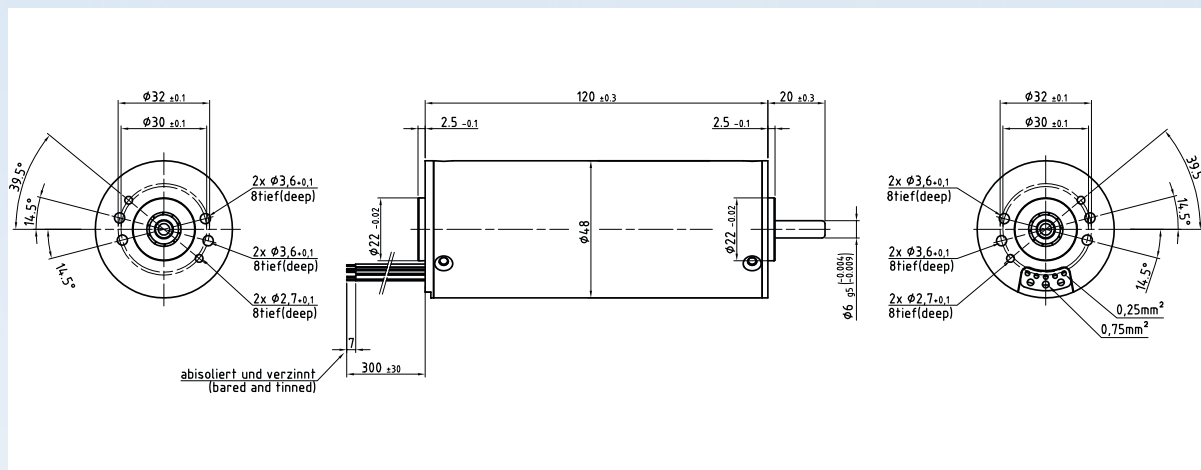
3) The operating at maximum levels reduces the lifespan

Stand: 22. Januar 2015 – changes reserved

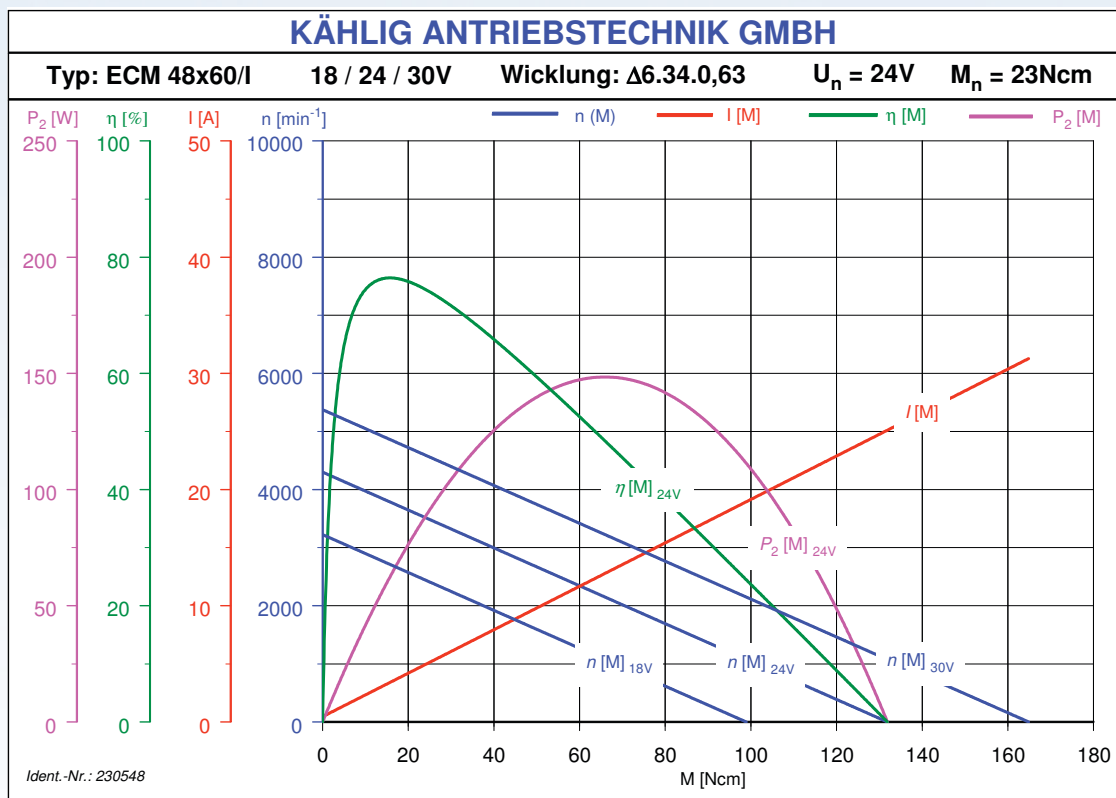
EC-Motor ECM48x60/I (24V)

Ident-Nr. 230548

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 85,9 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	23	
Rated speed ¹⁾	n_N	min ⁻¹	3550	±10%
Rated current ¹⁾	I_N	A	4,76	±20%
No load speed ¹⁾	n_0	min ⁻¹	4300	±15%
No load current ¹⁾	I_0	A	0,46	±50%
Rated power output ¹⁾	P_{2N}	W	85,9	
Rated power input ¹⁾	P_{1N}	W	114,1	
Rated efficiency ¹⁾	η_N	%	75,3	
Maximum power output ²⁾³⁾	P_{2max}	W	150,7	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	23	
Maximum Continuous current ²⁾³⁾	I_{max}	A	4,76	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	12000	
Stall torque ¹⁾	M_H	Ncm	133,6	
Stall current ¹⁾	I_H	A	25,4	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	0,94	
Stator resistance ¹⁾	R_A	Ω	0,59	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	0,57	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	32,3	
Torque constant ¹⁾	k_M	Ncm/A	5,3	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	5,6	
Friction torque ¹⁾	M_R	Ncm	-2,4	
Mechanical time constant ¹⁾	T_M	ms	3,2	
Electrical time constant ¹⁾	T_e	ms	0,6	
Rotor inertia	J_R	gcm ²	156	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	40	
Permissible radial shaft loads ³⁾	F_{radial}	N	100	
Protection class DIN VDE 0530	IP 50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

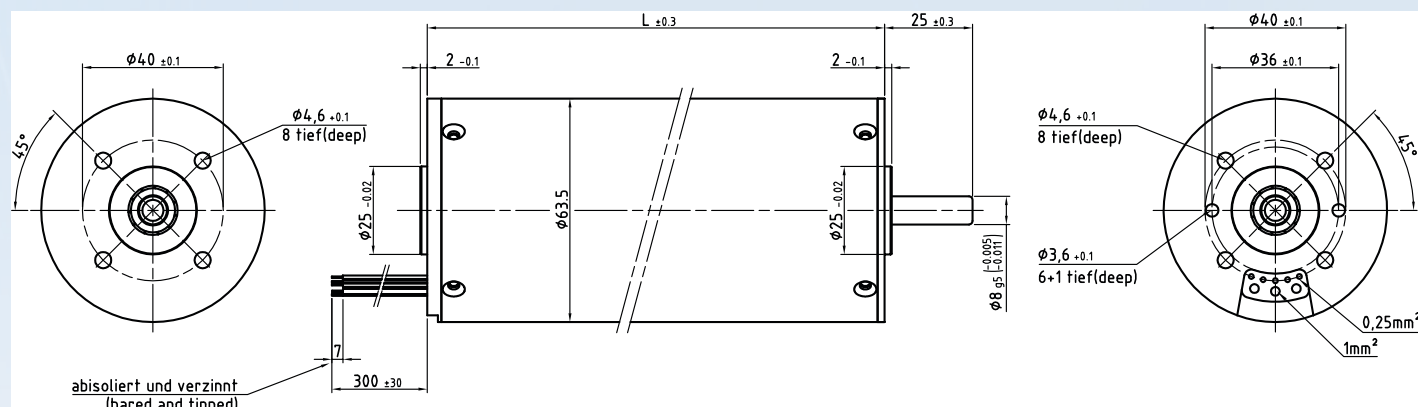
1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

3) The operating at maximum levels reduces the lifespan

Stand: 22. Januar 2015 – changes reserved

DC-Motors Type ECM63

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120 °
- Ball bearings
- Power range in continuous operation approx. 40 to 120 watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request

Versions	Unit	ECM63x20/I	ECM63x40/I	ECM63x60/I
Part number	[ID]	230532a	230531a	230493b
Nominal voltage	[V]	24	24	24
Nominal torque	[Ncm]	12	30	40
Nominal speed	[1/min]	3100	2600	2850
Nominal current	[A]	2,22	4,58	6,43
Output power ¹⁾	[W]	39,0	82,3	118,5
Rise of M-n-characteristic	[1/min / Ncm]	58,3	22,3	14,8
Torque constant	[Ncm / A]	6,5	7,3	6,8
Rotor moment of inertia	[gcm ²]	106	206	306
Weight	[kg]	0,8	1,2	1,55
Length	[mm]	90	110	130

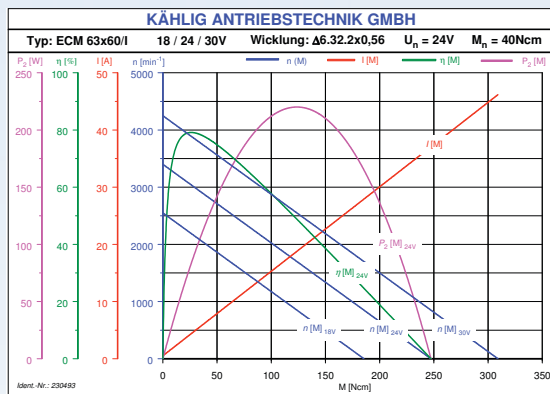
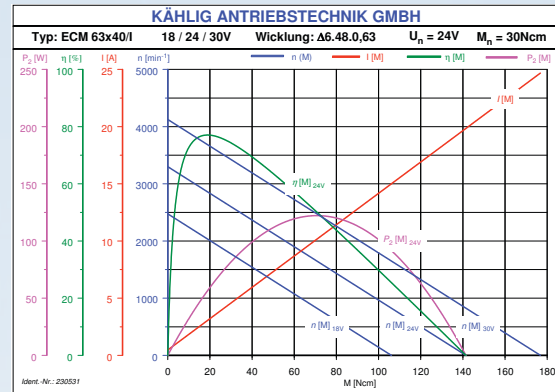
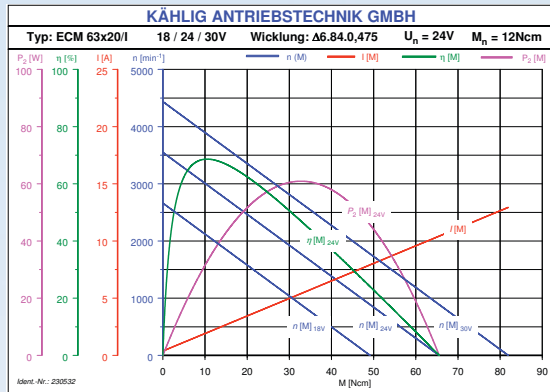
General data

Lifetime at rated torque ¹⁾	h	20000
Permissible axial shaft load ²⁾	N	110
Permissible radial shaft load ²⁾	N	300
Insulation class (DIN VDE 0530)		F
IP protection class (DIN VDE 0530)		IP 50
RFI suppression		-

¹⁾ Operation by nominal values. Date: 13.05.2008 Subject to change without notice
²⁾ At 3000 rpm and 3000 hrs nominal life, simultaneous axial and radial loads

Stand: 10. January 2014 – changes reserved

Performance characteristics

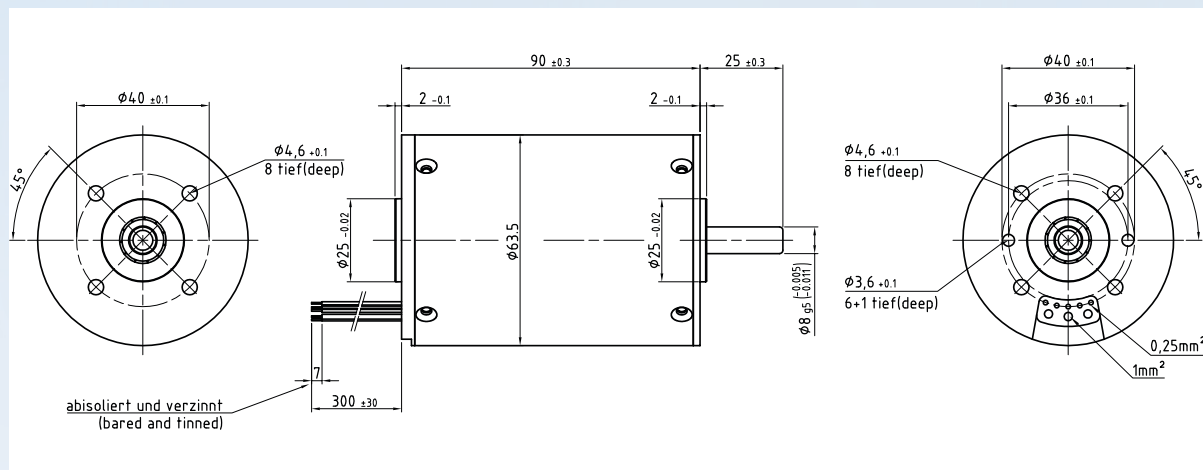


Stand: 10. January 2014 – changes reserved

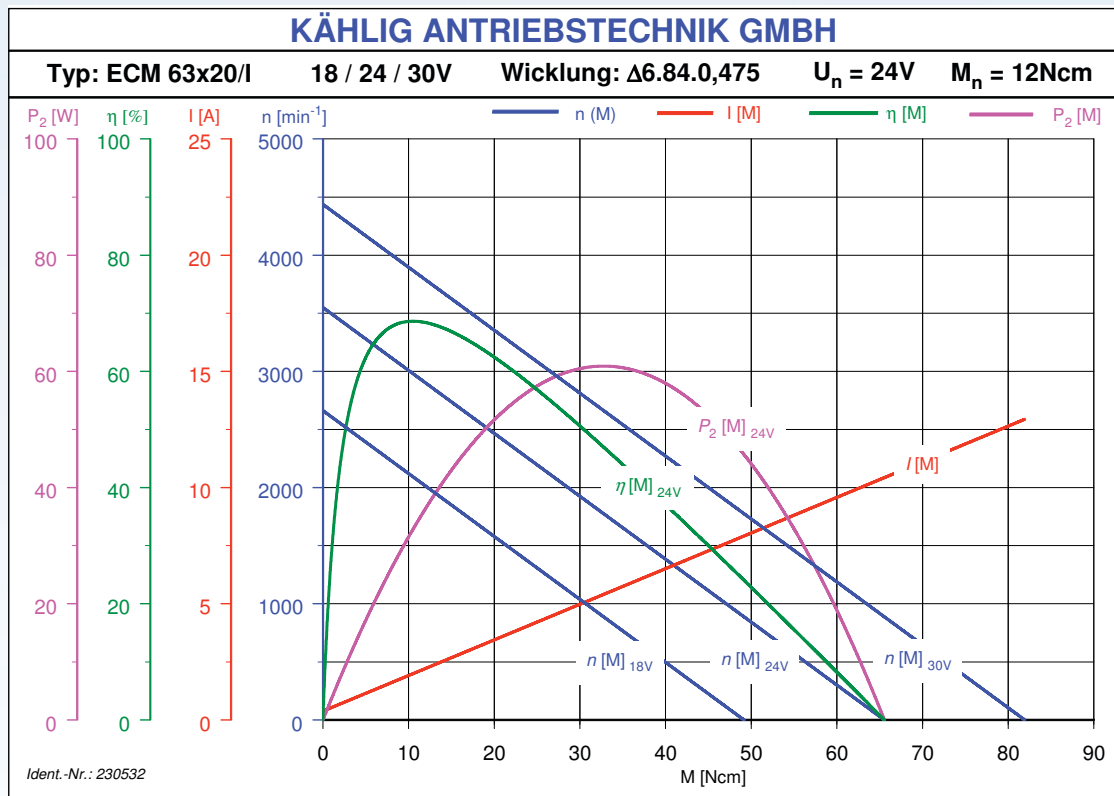
EC-Motor ECM63x20/I (24V)

Ident-Nr. 230532

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 39 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	12	
Rated speed ¹⁾	n_N	min ⁻¹	3100	±10%
Rated current ¹⁾	I_N	A	2,22	±20%
No load speed ¹⁾	n_0	min ⁻¹	3800	±15%
No load current ¹⁾	I_0	A	0,38	±50%
Rated power output ¹⁾	P_{2N}	W	39,0	
Rated power input ¹⁾	P_{1N}	W	53,3	
Rated efficiency ¹⁾	η_N	%	73,1	
Maximum power output ²⁾³⁾	P_{2max}	W	64,8	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	12	
Maximum Continuous current ²⁾³⁾	I_{max}	A	2,22	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	10000	
Stall torque ¹⁾	M_H	Ncm	65,1	
Stall current ¹⁾	I_H	A	10,4	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	2,3	
Stator resistance ¹⁾	R_A	Ω	1,45	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	1,52	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	58,3	
Torque constant ¹⁾	k_M	Ncm/A	6,5	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	6,3	
Friction torque ¹⁾	M_R	Ncm	-2,5	
Mechanical time constant ¹⁾	T_M	ms	3,6	
Electrical time constant ¹⁾	T_e	ms	0,7	
Rotor inertia	J_R	gcm ²	106	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	110	
Permissible radial shaft loads ³⁾	F_{radial}	N	300	
Protection class DIN VDE 0530	IP 50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

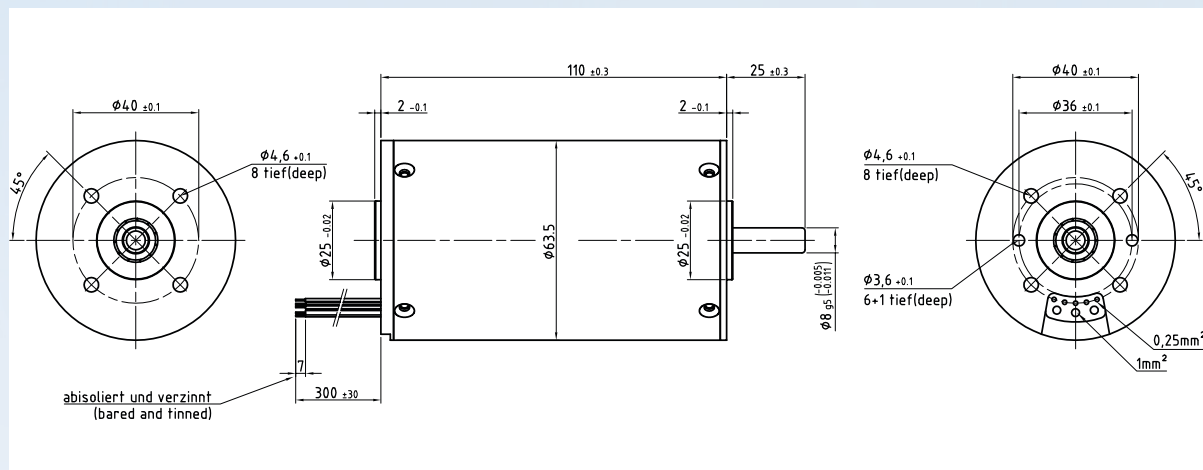
1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

3) The operating at maximum levels reduces the lifespan

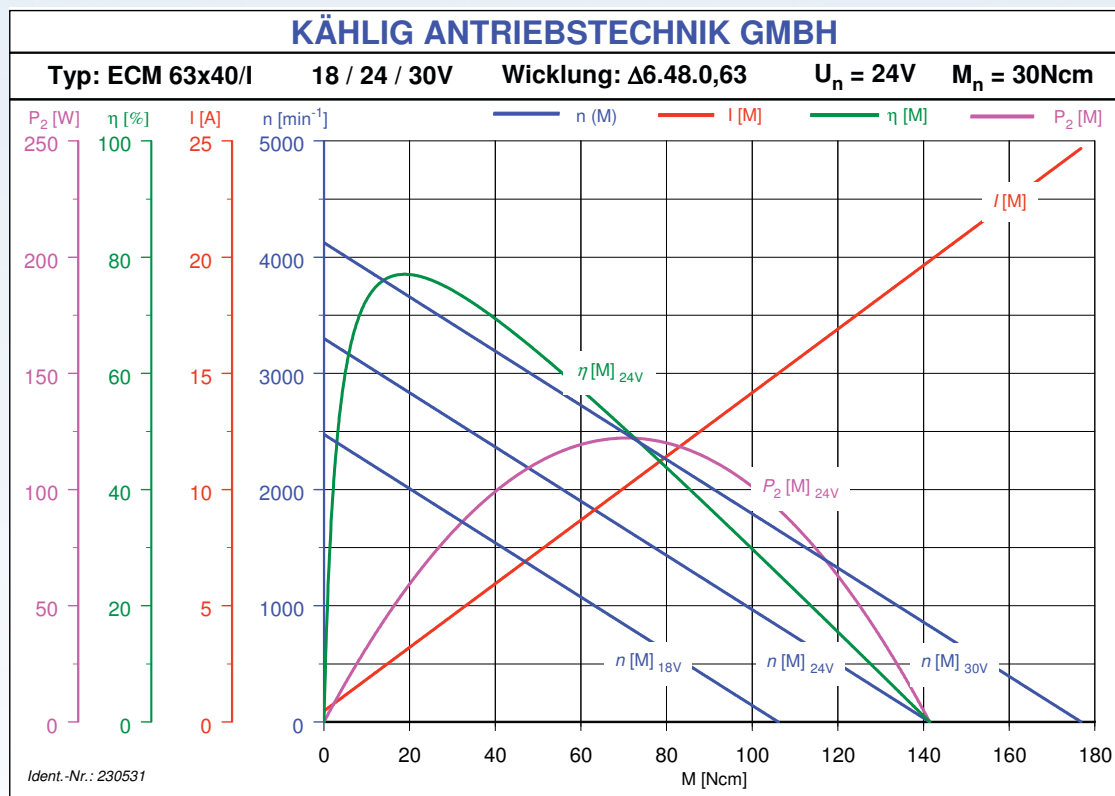
Stand: 22. Januar 2015 – changes reserved

EC-Motor ECM63x40/I (24V) Ident-Nr. 230531

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 82.3 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	30	
Rated speed ¹⁾	n_N	min ⁻¹	2600	±10%
Rated current ¹⁾	I_N	A	4,58	±20%
No load speed ¹⁾	n_0	min ⁻¹	3300	±15%
No load current ¹⁾	I_0	A	0,47	±50%
Rated power output ¹⁾	P_{2N}	W	82,3	
Rated power input ¹⁾	P_{1N}	W	109,8	
Rated efficiency ¹⁾	η_N	%	74,9	
Maximum power output ²⁾³⁾	P_{2max}	W	126,7	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	30	
Maximum Continuous current ²⁾³⁾	I_{max}	A	4,58	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	8000	
Stall torque ¹⁾	M_H	Ncm	147,4	
Stall current ¹⁾	I_H	A	20,6	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	1,16	
Stator resistance ¹⁾	R_A	Ω	0,65	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	0,84	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	22,3	
Torque constant ¹⁾	k_M	Ncm/A	7,3	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	7,3	
Friction torque ¹⁾	M_R	Ncm	3,4	
Mechanical time constant ¹⁾	T_M	ms	2,5	
Electrical time constant ¹⁾	T_e	ms	0,7	
Rotor inertia	J_R	gcm ²	206	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	110	
Permissible radial shaft loads ³⁾	F_{radial}	N	300	
Protection class DIN VDE 0530	IP 50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

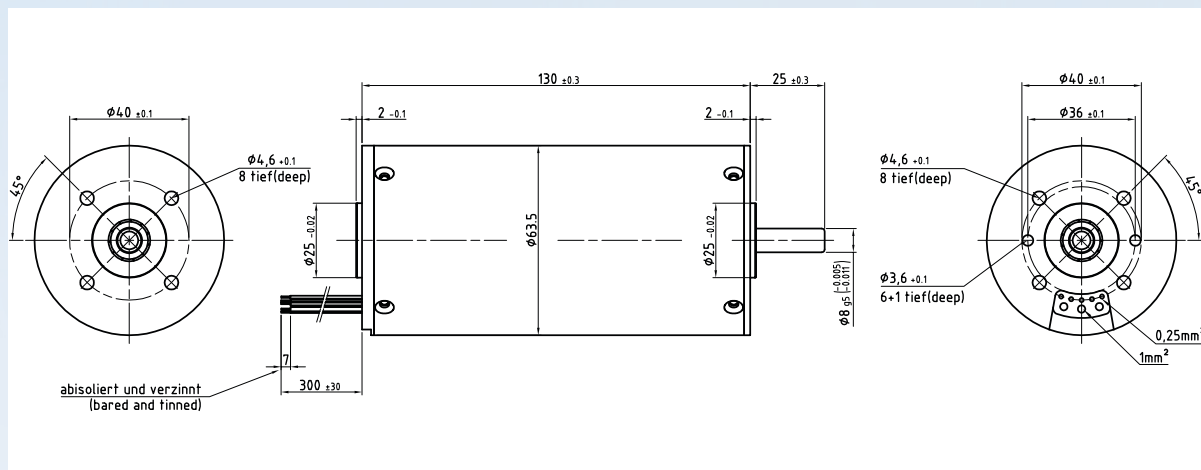
3) The operating at maximum levels reduces the lifespan

Stand: 22. Januar 2015 – changes reserved

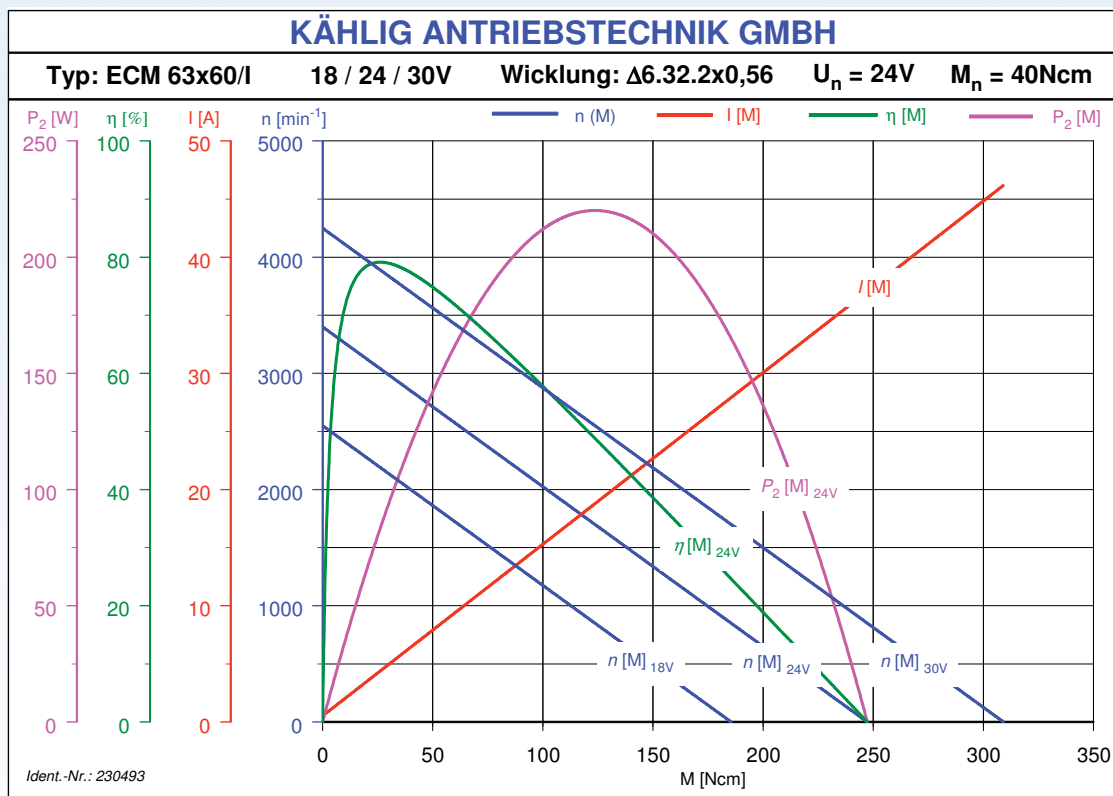
EC-Motor ECM63x60/I (24V)

Ident-Nr. 230493

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 118,5 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	40	
Rated speed ¹⁾	n_N	min ⁻¹	2850	±10%
Rated current ¹⁾	I_N	A	6,43	±20%
No load speed ¹⁾	n_0	min ⁻¹	3400	±15%
No load current ¹⁾	I_0	A	0,52	±50%
Rated power output ¹⁾	P_{2N}	W	118,5	
Rated power input ¹⁾	P_{1N}	W	154,3	
Rated efficiency ¹⁾	η_N	%	76,8	
Maximum power output ²⁾³⁾	P_{2max}	W	204,8	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	40	
Maximum Continuous current ²⁾³⁾	I_{max}	A	6,43	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	8000	
Stall torque ¹⁾	M_H	Ncm	229,7	
Stall current ¹⁾	I_H	A	34,5	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	0,7	
Stator resistance ¹⁾	R_A	Ω	0,34	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	0,53	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	14,8	
Torque constant ¹⁾	k_M	Ncm/A	6,8	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	7,0	
Friction torque ¹⁾	M_R	Ncm	-3,5	
Mechanical time constant ¹⁾	T_M	ms	2,3	
Electrical time constant ¹⁾	T_e	ms	0,8	
Rotor inertia	J_R	gcm ²	306	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	110	
Permissible radial shaft loads ³⁾	F_{radial}	N	300	
Protection class DIN VDE 0530	IP 50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

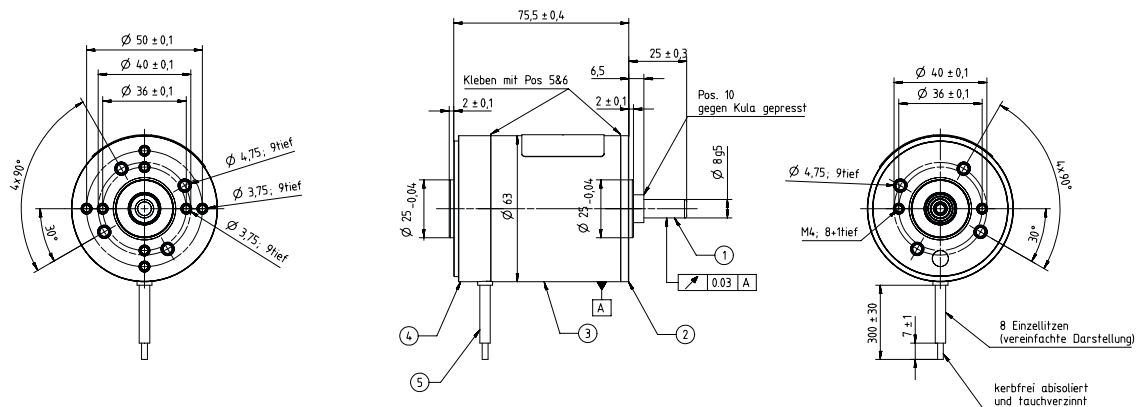
3) The operating at maximum levels reduces the lifespan

Stand: 22. Januar 2015 – changes reserved

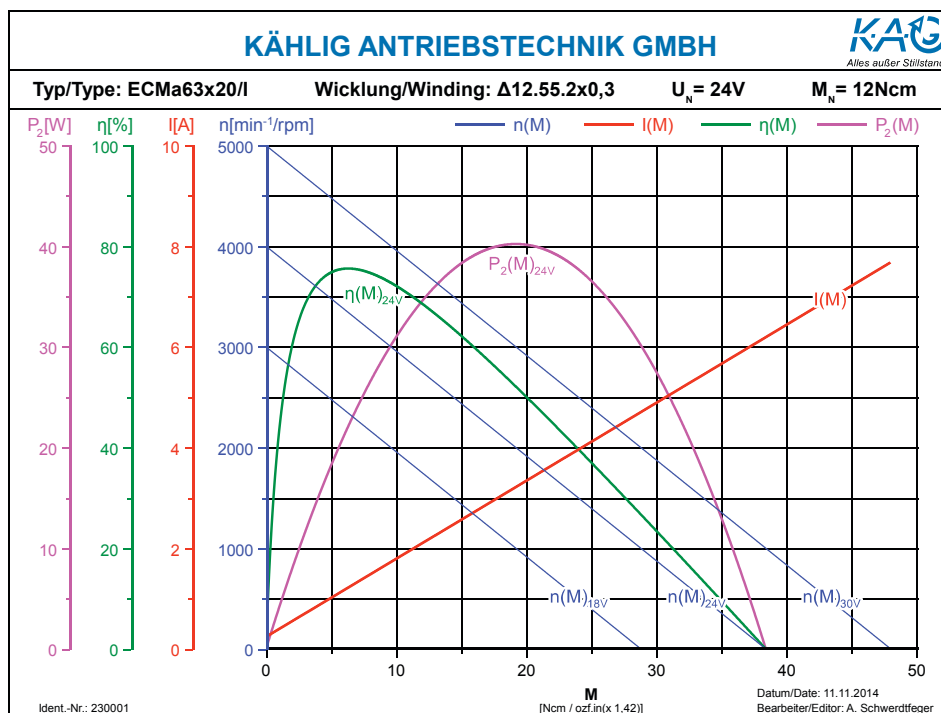
EC-Motor ECMa63x20/I (24V)

Ident-Nr. 230001

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Closed alu housing with zinc-die-cast bearing flanges
- Direction CW / CCW
- Power output in rated operation: 34,6 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 11. November 2014 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	12	
Rated speed ¹⁾	n_N	min ⁻¹	2750	±10%
Rated current ¹⁾	I_N	A	2,1	±20%
No load speed ¹⁾	n_0	min ⁻¹	4000	±15%
No load current ¹⁾	I_0	A	0,25	±50%
Rated power output ¹⁾	P_{2N}	W	34,6	
Rated power input ¹⁾	P_{1N}	W	50,4	
Rated efficiency ¹⁾	η_N	%	68,6	
Maximum power output ²⁾³⁾	P_{2max}	W	40,2	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	12	
Maximum Continuous current ²⁾³⁾	I_{max}	A	2,1	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	8000	
Stall torque ¹⁾	M_H	Ncm	38,4	
Stall current ¹⁾	I_H	A	6,15	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	-	
Stator resistance ¹⁾	R_A	Ω	2,1	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	2	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	-104,2	
Torque constant ¹⁾	k_M	Ncm/A	6,5	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	6,0	
Friction torque ¹⁾	M_R	Ncm	-1,6	
Mechanical time constant ¹⁾	T_M	ms	6,78	
Electrical time constant ¹⁾	T_e	ms	0,95	
Rotor inertia	J_R	gcm ²	106	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	-	
Permissible axial shaft loads ³⁾	F_{axial}	N	110	
Permissible radial shaft loads ³⁾	F_{radial}	N	300	
Protection class DIN VDE 0530	IP40			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	E			
Lifetime at rated torque [h] ¹⁾	<= 20.000h			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

1) ϑ_w Winding temperature $\approx 20^\circ\text{C}$ 2) $\Delta\vartheta_w$ allowable = 100K

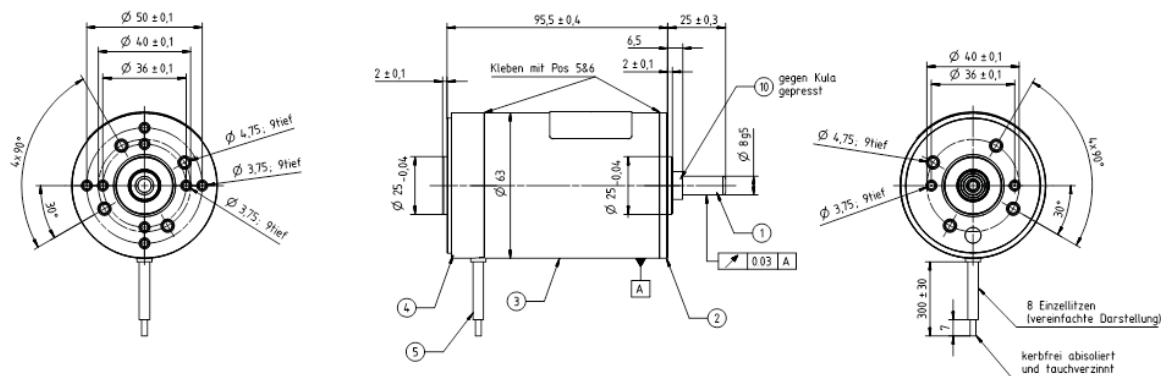
3) The operating at maximum levels reduces the lifespan

Stand: 11. November 2014 – changes reserved

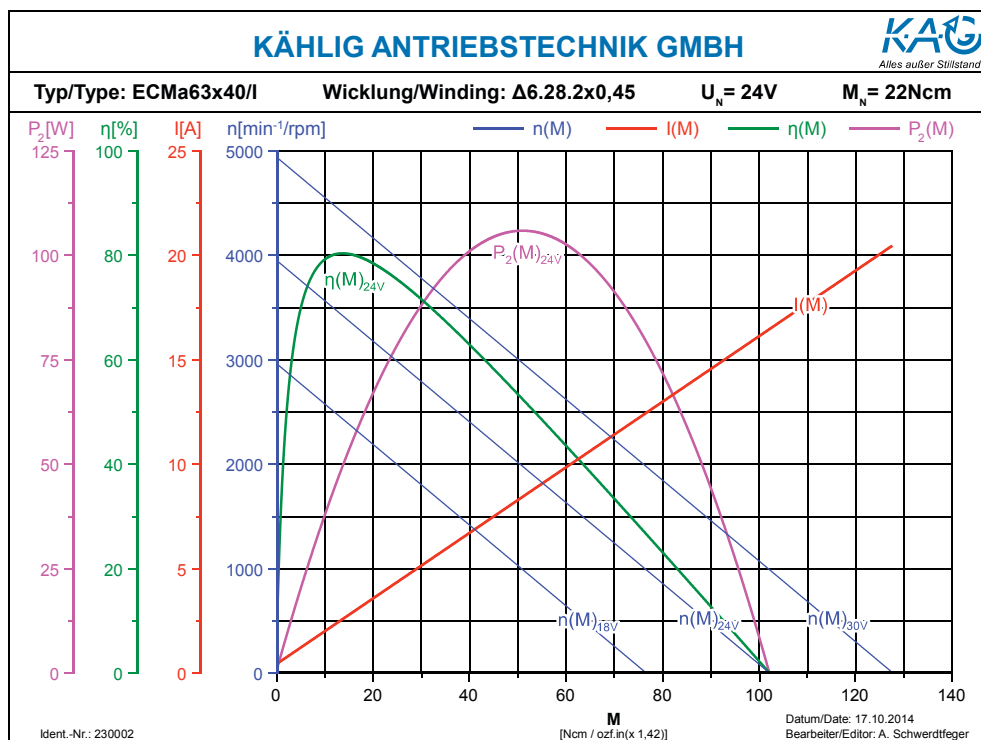
EC-Motor ECMa63x40/I (24V)

Ident-Nr. 230002

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Closed alu housing with zinc-die-cast bearing flanges
- Direction CW / CCW
- Power output in rated operation: 71.4 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 11. November 2014 – changes reserved

Leistungsdaten

	Zeichen	Einheit	Wert	Toleranzen
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	22	
Rated speed ¹⁾	n_N	min ⁻¹	3100	±10%
Rated current ¹⁾	I_N	A	3,85	±20%
No load speed ¹⁾	n_0	min ⁻¹	3950	±15%
No load current ¹⁾	I_0	A	0,4	±50%
Rated power output ¹⁾	P_{2N}	W	71,4	
Rated power input ¹⁾	P_{1N}	W	92,4	
Rated efficiency ¹⁾	η_N	%	77,3	
Maximum power output ²⁾³⁾	P_{2max}	W	70,9	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	22	
Maximum Continuous current ²⁾³⁾	I_{max}	A	3,85	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	8000	
Stall torque ¹⁾	M_H	Ncm	102,2	
Stall current ¹⁾	I_H	A	16,4	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	0,644	
Stator resistance ¹⁾	R_A	Ω	-	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	0,56	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	-38,6	
Torque constant ¹⁾	k_M	Ncm/A	6,4	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	6,1	
Friction torque ¹⁾	M_R	Ncm	-2,6	
Mechanical time constant ¹⁾	T_M	ms	3,94	
Electrical time constant ¹⁾	T_e	ms	0,87	
Rotor inertia	J_R	gcm ²	206	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	110	
Permissible radial shaft loads ³⁾	F_{radial}	N	300	
Protection class DIN VDE 0530	IP 50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	≥ 20000 h			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

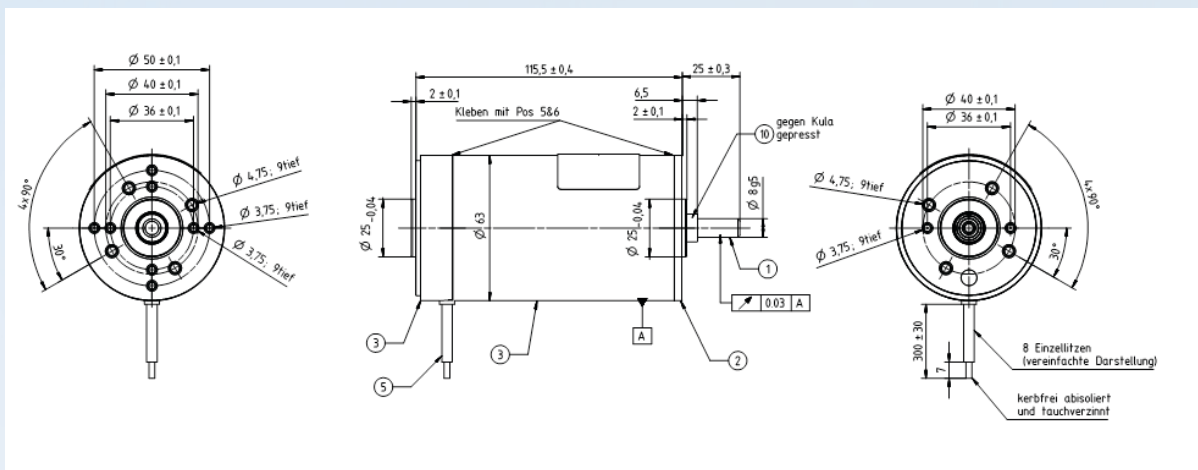
3) The operating at maximum levels reduces the lifespan

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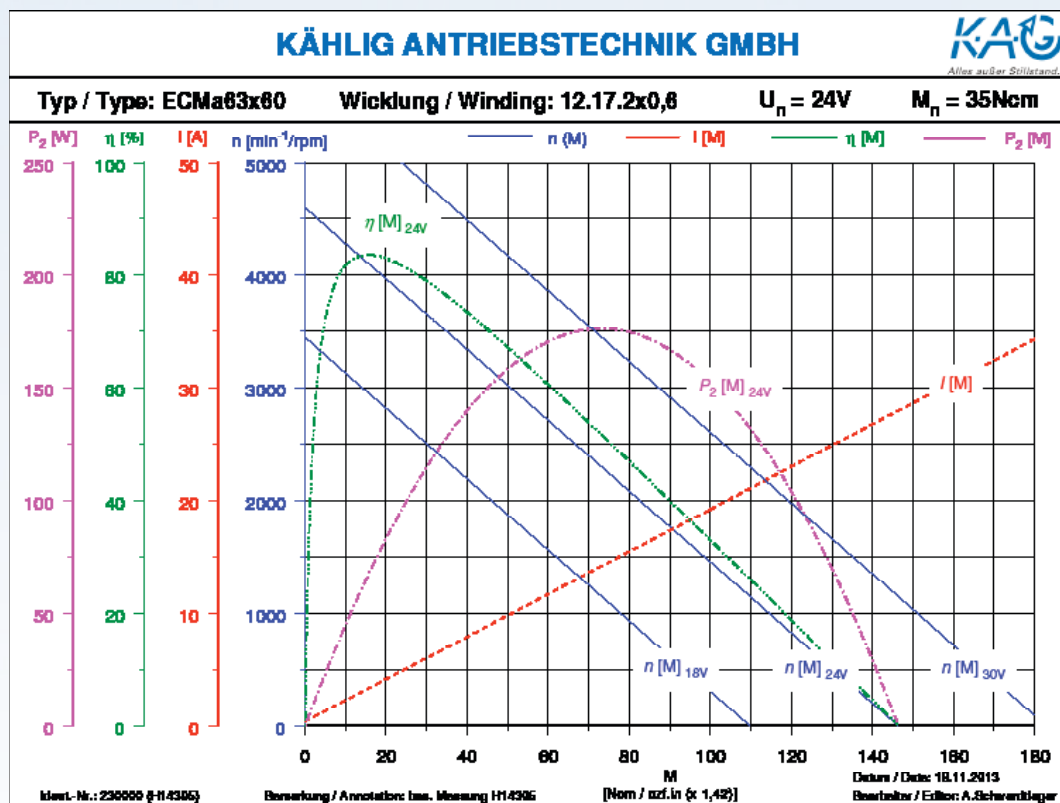
EC-Motor ECMa63x60/I (24V)

Ident-Nr. 230000

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Closed alu housing with zinc-die-cast bearing flanges
- Direction CW / CCW
- Power output in rated operation: 128,3 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



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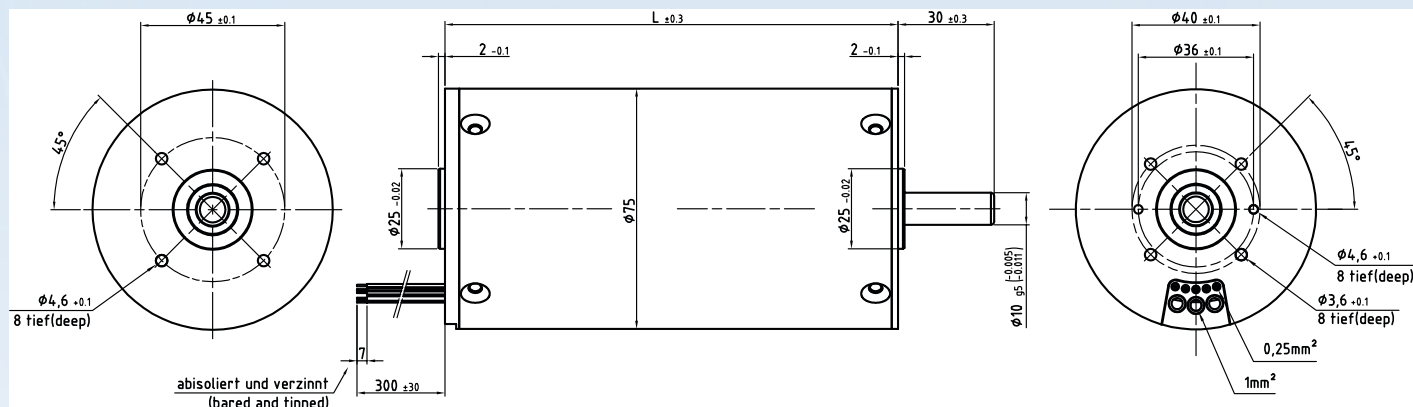
Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	35	
Rated speed ¹⁾	n_N	min ⁻¹	3500	±10%
Rated current ¹⁾	I_N	A	7	±20%
No load speed ¹⁾	n_0	min ⁻¹	4600	±15%
No load current ¹⁾	I_0	A	0,4	±50%
Rated power output ¹⁾	P_{2N}	W	128,3	
Rated power input ¹⁾	P_{1N}	W	168	
Rated efficiency ¹⁾	η_N	%	76,4	
Maximum power output ²⁾³⁾	P_{2max}	W	176,3	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	35	
Maximum Continuous current ²⁾³⁾	I_{max}	A	7	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	8000	
Stall torque ¹⁾	M_H	Ncm	146,4	
Stall current ¹⁾	I_H	A	28	
Demagnetization current	I_E	A		
Connecting resistance ¹⁾	R	Ω		
Stator resistance ¹⁾	R_A	Ω		±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH		
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	-31,4	
Torque constant ¹⁾	k_M	Ncm/A	5,3	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	5,2	
Friction torque ¹⁾	M_R	Ncm	-3,5	
Mechanical time constant ¹⁾	T_M	ms	1,1	
Electrical time constant ¹⁾	T_e	ms		
Rotor inertia	J_R	gcm ²	306	
Maximum case temperature ²⁾	ϑ_G	°C	80	
Starting voltage ¹⁾	U_A	V		
Permissible axial shaft loads ³⁾	F_{axial}	N	110	
Permissible radial shaft loads ³⁾	F_{radial}	N	300	
Protection class DIN VDE 0530	IP40			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	E			
Lifetime at rated torque [h] ¹⁾	<= 20.000h			
Ambient temperature	-30°C bis +40°C			
Bearing	2 Kugellager			
Interference suppression	-			

1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K
 3) The operating at maximum levels reduces the lifespan

DC-Motors Type ECM75

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120 °
- Ball bearings
- Power range in continuous operation approx. 60 to 220 watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request

Versions	Unit	ECM75x20/I	ECM75x40/I	ECM75x60/I
Part number	[ID]	230549b	230550b	230551b
Nominal voltage	[V]	24	24	24
Nominal torque	[Ncm]	20	40	70
Nominal speed	[1/min]	2750	2900	3000
Nominal current	[A]	3,39	6,49	11,49
Output power ¹⁾	[W]	57,4	120,8	217,7
Rise of M-n-characteristic	[1/min / Ncm]	43,5	16,8	10,5
Torque constant	[Ncm / A]	6,6	6,7	6,5
Rotor moment of inertia	[gcm²]	385	496	603
Weight	[kg]	1,25	1,75	2,3
Length	[mm]	101,5	121,5	141,5

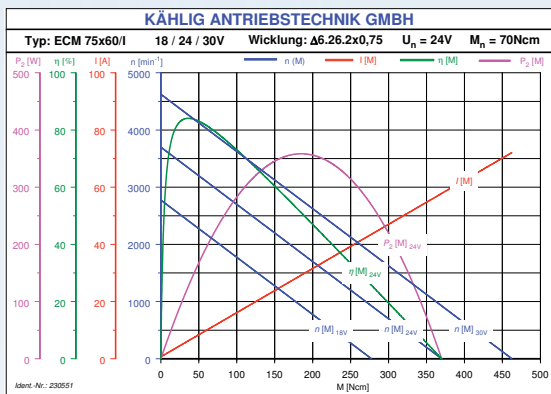
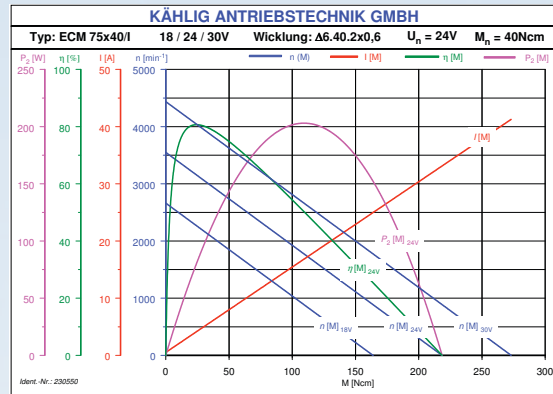
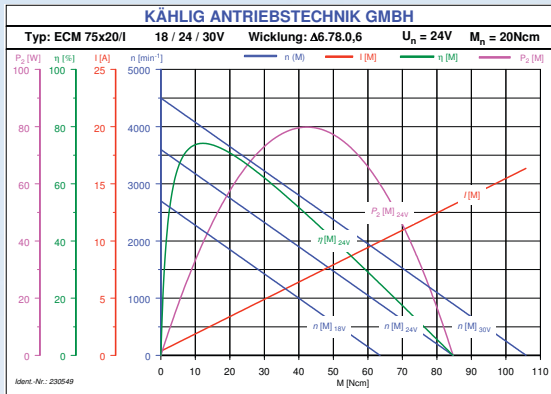
General data

Lifetime at rated torque ¹⁾	h	20000
Permissible axial shaft load ²⁾	N	110
Permissible radial shaft load ²⁾	N	300
Insulation class (DIN VDE 0530)		F
IP protection class (DIN VDE 0530)		IP 50
RFI suppression		-

1) Operation by nominal values: Date: 13.05.2008 Subject to change without notice
2) At 3000 rpm and 3000 hrs nominal life, simultaneous axial and radial loads

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Performance characteristics

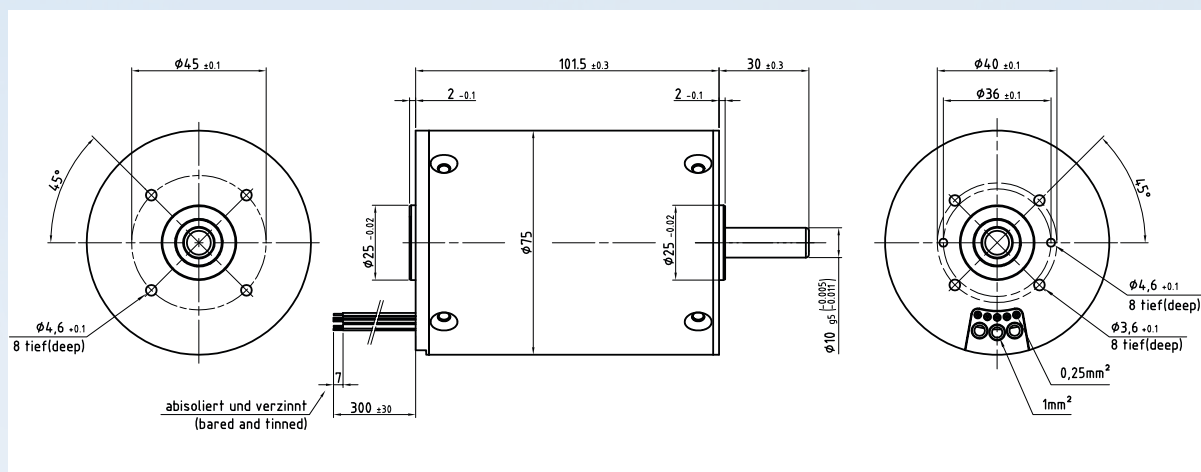


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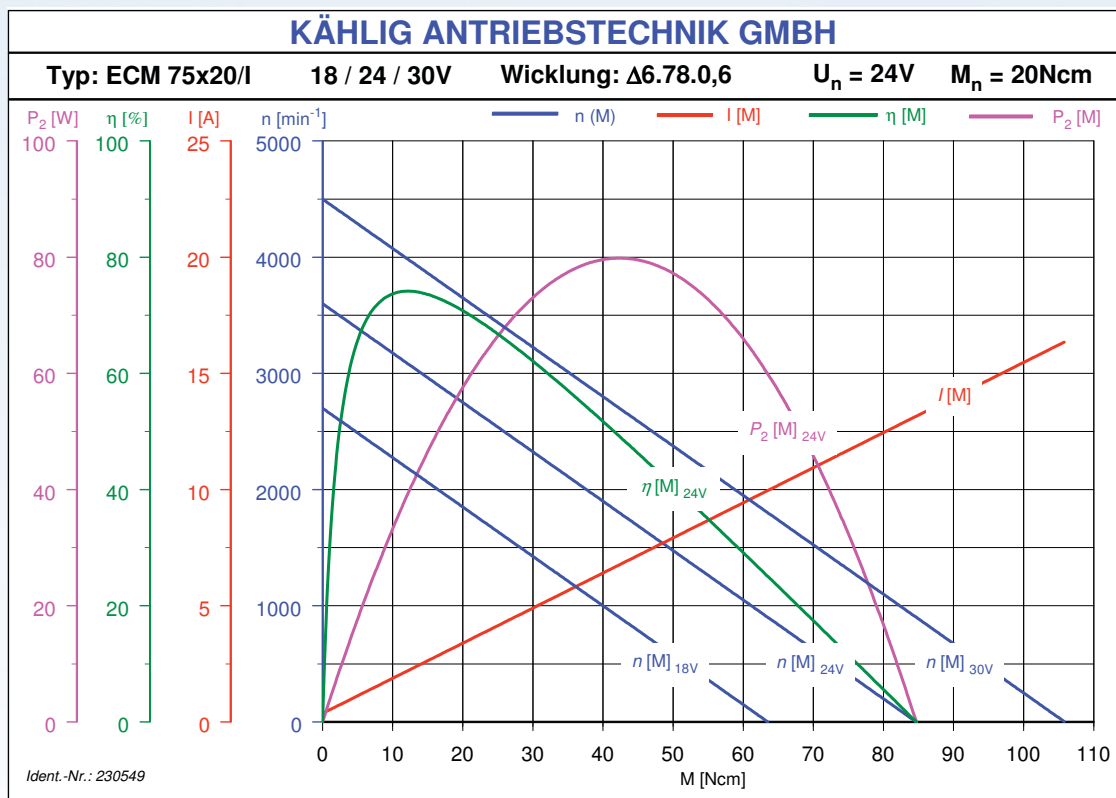
EC-Motor ECM75x20/I (24V)

Ident-Nr. 230549

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 57,4 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	20	
Rated speed ¹⁾	n_N	min ⁻¹	2750	±10%
Rated current ¹⁾	I_N	A	3,39	±20%
No load speed ¹⁾	n_0	min ⁻¹	3600	±15%
No load current ¹⁾	I_0	A	0,37	±50%
Rated power output ¹⁾	P_{2N}	W	57,4	
Rated power input ¹⁾	P_{1N}	W	81,4	
Rated efficiency ¹⁾	η_N	%	70,6	
Maximum power output ²⁾³⁾	P_{2max}	W	78,5	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	20	
Maximum Continuous current ²⁾³⁾	I_{max}	A	3,39	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	8000	
Stall torque ¹⁾	M_H	Ncm	83	
Stall current ¹⁾	I_H	A	12,9	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	1,86	
Stator resistance ¹⁾	R_A	Ω	1,05	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	1,06	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	43,5	
Torque constant ¹⁾	k_M	Ncm/A	6,6	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	6,6	
Friction torque ¹⁾	M_R	Ncm	-2,5	
Mechanical time constant ¹⁾	T_M	ms	9,2	
Electrical time constant ¹⁾	T_e	ms	0,6	
Rotor inertia	J_R	gcm ²	385	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	110	
Permissible radial shaft loads ³⁾	F_{radial}	N	300	
Protection class DIN VDE 0530	IP 50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

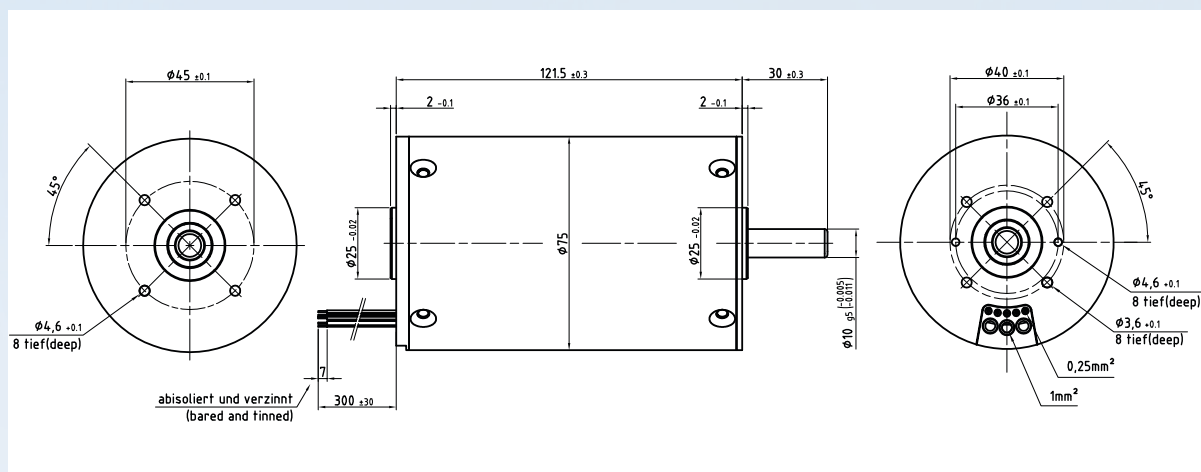
3) The operating at maximum levels reduces the lifespan

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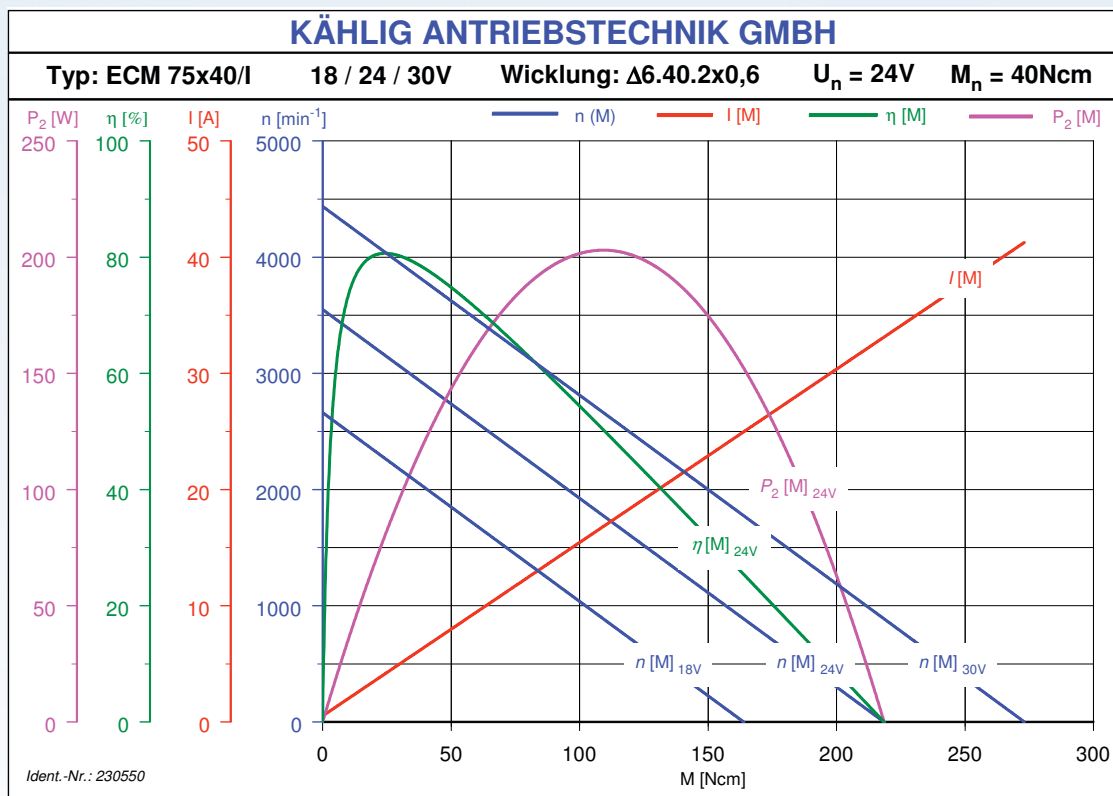
EC-Motor ECM75x40/I (24V)

Ident-Nr. 230550

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 120,8 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



Stand: 22. Januar 2015 – changes reserved

Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	40	
Rated speed ¹⁾	n_N	min ⁻¹	2900	±10%
Rated current ¹⁾	I_N	A	6,49	±20%
No load speed ¹⁾	n_0	min ⁻¹	3550	±15%
No load current ¹⁾	I_0	A	0,52	±50%
Rated power output ¹⁾	P_{2N}	W	120,8	
Rated power input ¹⁾	P_{1N}	W	155,8	
Rated efficiency ¹⁾	η_N	%	77,5	
Maximum power output ²⁾³⁾	P_{2max}	W	197,3	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	40	
Maximum Continuous current ²⁾³⁾	I_{max}	A	6,49	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	8000	
Stall torque ¹⁾	M_H	Ncm	212,1	
Stall current ¹⁾	I_H	A	32,2	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	0,75	
Stator resistance ¹⁾	R_A	Ω	0,35	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	0,59	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	16,8	
Torque constant ¹⁾	k_M	Ncm/A	6,7	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	6,8	
Friction torque ¹⁾	M_R	Ncm	-3,5	
Mechanical time constant ¹⁾	T_M	ms	3,9	
Electrical time constant ¹⁾	T_e	ms	0,8	
Rotor inertia	J_R	gcm ²	496	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	110	
Permissible radial shaft loads ³⁾	F_{radial}	N	300	
Protection class DIN VDE 0530	IP 50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

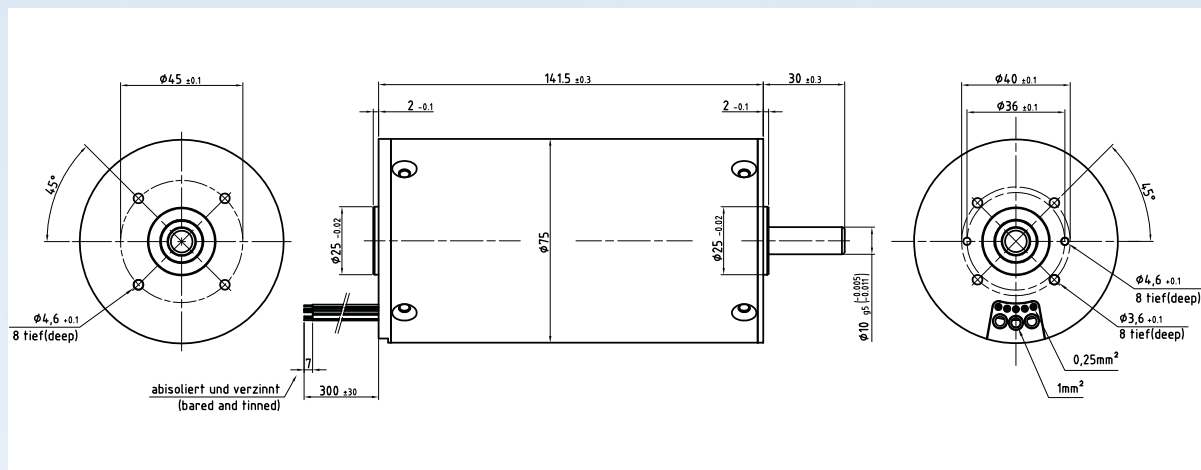
1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

3) The operating at maximum levels reduces the lifespan

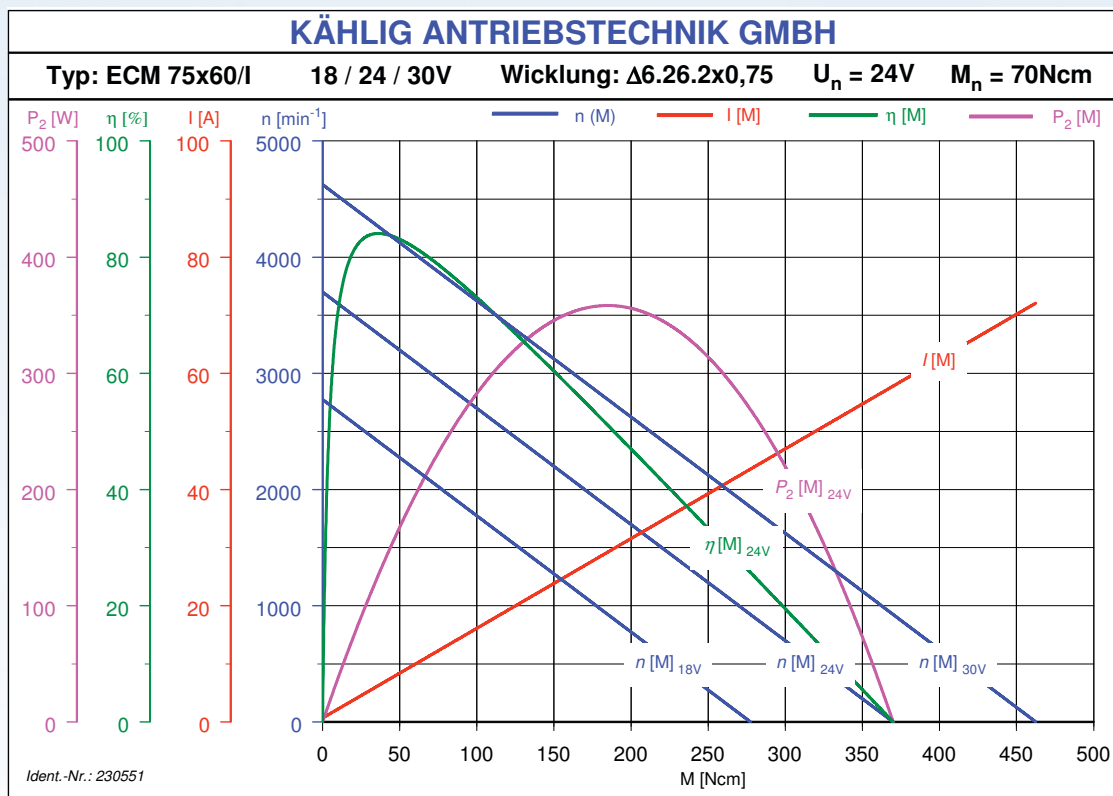
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EC-Motor ECM75x60/I (24V) Ident-Nr. 230551

- 4-pole rotor with plastic-bonded magnets NeFeB
- Threefold winding connected in delta
- Internal Hall sensors for rotor position detection offset by 120°
- Ball bearings
- Multiple combination possibilities with gears, encoders, brakes
- Power output in rated operation: 217,7 Watt
- Multiple combination possibilities with gears, encoders, brakes and integrated electronics



Application on request



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Performance

	Sign	Unit	Value	Tolerances
Rated voltage	U_N	V	24	
Rated torque ¹⁾	M_N	Ncm	70	
Rated speed ¹⁾	n_N	min ⁻¹	3000	±10%
Rated current ¹⁾	I_N	A	11,49	±20%
No load speed ¹⁾	n_0	min ⁻¹	3700	±15%
No load current ¹⁾	I_0	A	0,68	±50%
Rated power output ¹⁾	P_{2N}	W	217,7	
Rated power input ¹⁾	P_{1N}	W	275,8	
Rated efficiency ¹⁾	η_N	%	78,9	
Maximum power output ²⁾³⁾	P_{2max}	W	342,3	
Maximum Continuous torque ²⁾³⁾	M_{max}	Ncm	70	
Maximum Continuous current ²⁾³⁾	I_{max}	A	11,49	
Maximum speed ¹⁾³⁾	n_{max}	min ⁻¹	8000	
Stall torque ¹⁾	M_H	Ncm	352,9	
Stall current ¹⁾	I_H	A	55,2	
Demagnetization current	I_E	A	-	
Connecting resistance ¹⁾	R	Ω	0,44	
Stator resistance ¹⁾	R_A	Ω	0,18	±5%
Stator inductance [1 kHz] ¹⁾	L_A	mH	0,35	
Rise of speed-characteristic ¹⁾	k_D	min ⁻¹ /Ncm	10,5	
Torque constant ¹⁾	k_M	Ncm/A	6,5	
Voltage constant ¹⁾	k_E	V/10 ³ min ⁻¹	6,5	
Friction torque ¹⁾	M_R	Ncm	-4,4	
Mechanical time constant ¹⁾	T_M	ms	2,6	
Electrical time constant ¹⁾	T_e	ms	0,8	
Rotor inertia	J_R	gcm ²	603	
Maximum case temperature ²⁾	ϑ_G	°C	100	
Starting voltage ¹⁾	U_A	V	20	
Permissible axial shaft loads ³⁾	F_{axial}	N	110	
Permissible radial shaft loads ³⁾	F_{radial}	N	300	
Protection class DIN VDE 0530	IP 50			
Duty cycle DIN VDE 0530	S1			
Insulation class DIN VDE 0530	F			
Lifetime at rated torque [h] ¹⁾	20000			
Ambient temperature	-30°C to +40°C			
Bearing	2 ball bearings			
Interference suppression	-			

1) ϑ_w Winding temperature ≈ 20°C 2) $\Delta\vartheta_w$ allowable = 100K

3) The operating at maximum levels reduces the lifespan

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