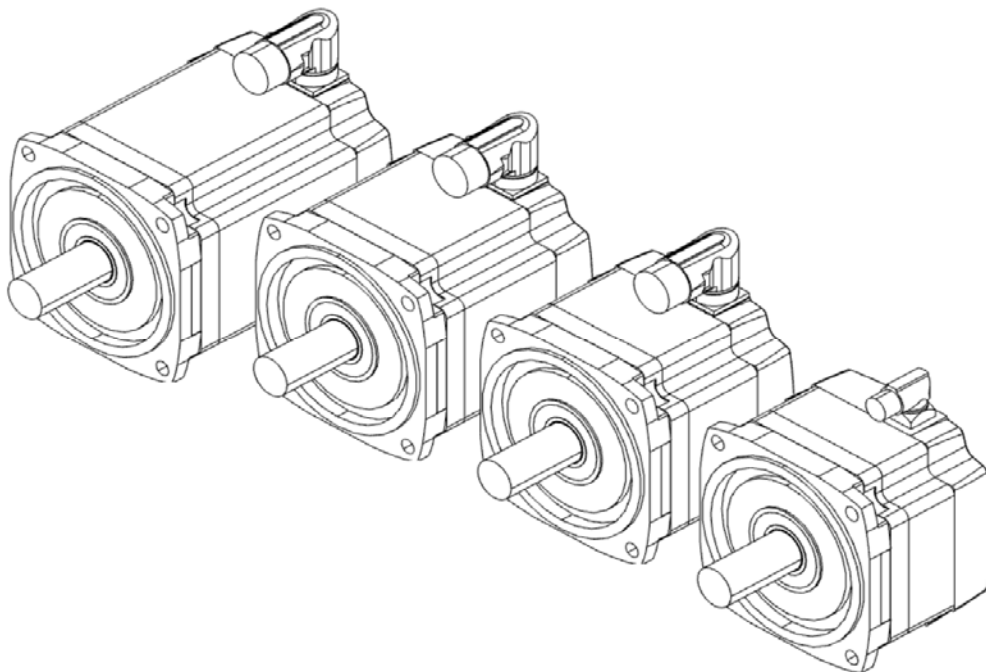




Synchronous Motors SIMOTICS S-1FK7

- Generation 2 -

Extention of SIMOTICS S-1FK7 High Inertia
Addition of Shaft Height 100



Feed motors for SINAMICS S120

1FK7 High Inertia motors Natural cooling

Selection and Ordering Data

Rated speed	Shaft height	Rated power at $\Delta T=100\text{ K}$	Stall torque	Rated torque	Rated current	Synchronous motor 1FK7 High Inertia	Number of pole pairs	Rotor inertia (without brake)	Rotor inertia (with brake)	Weight (without brake)	Weight (with brake)	Efficiency ¹⁾	Stall current	Calculated power $M_0 \times n_{rated}/9550$
n_{rated}	SH	P_{rated}	M_0	M_{rated}	I_{rated}	Order No.	2p	J	J	m	m	η	I_0	P_{calc}
rpm		kW	Nm	Nm	A			kgcm ²	kgcm ²	kg	kg	%	A	kW

1FK7 High Inertia 510V - 720 V

2000	100	3	18.0	14.5	7.1	1FK7100-3BC71-1□□□	4	87	95	19.4	22.8	92	8.4	3.8
2000	100	4.3	27.0	20.5	9.7	1FK7101-3BC71-1□□□	4	127	136	25.7	30.2	93	12.3	5.7
2000	100	5.2	36.0	25.0	11.0	1FK7103-3BC71-1□□□	4	168	176	32.1	36.6	93	14.4	7.5
2000	100	7.7	48.0	37.0	16.0	1FK7105-3BC71-1□□□	4	249	258	44.4	48.9	93	20.0	10.1
3000	100	4.9	27.0	15.5	11.6	1FK7101-3BF71-1□□□	4	127	136	25.7	30.2	93	18.8	8.5
3000	100	4.4	36.0	14.0	11.5	1FK7103-3BF71-1□□□	4	168	176	32.1	36.6	93	26.0	11.3

Encoder systems for motors without DRIVE-CLiQ interface:

IC2048S/R	Incremental encoder sin/cos 1 Vpp 2048 S/R	1FK7 A
AM2048S/R	Absolute encoder EnDat 2048 S/R	1FK7 E

Encoder systems for motors with DRIVE-CLiQ interface:

AS24DQI	Absolute encoder singleturn 24 bit	1FK7 B
AM24DQI	Absolute encoder 24 bit + 12 bit multiturn	1FK7 C
AS20DQI	Absolute encoder singleturn 20 bit	1FK7 Q
AM20DQI	Absolute encoder 20 bit + 12 bit multiturn	1FK7 R

Shaft extension: Shaft and flange accuracy: Holding brake

Fitted key and keyway	Tolerance N	without	1FK7 A
Fitted key and keyway	Tolerance N	with	1FK7 B
Plain shaft	Tolerance N	without	1FK7 G
Plain shaft	Tolerance N	with	1FK7 H

Degree of protection:

IP 64	1FK7 0
IP 65	1FK7 1
IP 65 and DE-flange IP67	1FK7 2

¹⁾ Optimum efficiency at continuous load

Feed motors for SINAMICS S110/S120

1FK7 High Inertia
Natural cooling

Assignment to the SINAMICS inverter modules

Servomotor SIMOTICS S-1FK7 Compact			Inverter SINAMICS S110/S120				Cable
Order No.	Power connector size	Cable cross-section *)	Inverter Module	Rated output current I_{rated}	Motor: stall torque M_0	Motor: Max. torque M_{Max}	Preassembled cable for Inverter Module
		mm ²	Order No.	A	Nm	Nm	Order No.

Motors for SINAMICS S120 Booksize			Motor Module Booksize				Cable for Motor Module Booksize
1FK7100-3BC71-1□□□	1	4x1.5	6SL312□-□TE21-0AA3	9	18	53,4	6FX□002-5□N01-□□□□
1FK7101-3BC71-1□□□	1.5	4x1.5	6SL312□-□TE21-8AA3	18	27	80	6FX□002-5□N21-□□□□
1FK7101-3BF71-1□□□	1.5	4x2.5	6SL312□-□TE21-8AA3	18	26	72	6FX□002-5□N31-□□□□
1FK7103-3BC71-1□□□	1.5	4x1.5	6SL312□-□TE21-8AA3	18	36	108	6FX□002-5□N21-□□□□
1FK7103-3BF71-1□□□	1.5	4x4	6SL312□-□TE23-0AA3	30	36	77	6FX□002-5□N41-□□□□
1FK7105-3BC71-1□□□	1.5	4x2.5	6SL312□-□TE23-0AA3	30	48	126	6FX□002-5□N31-□□□□

Motors for SINAMICS S120 Booksize Compact			Motor Module Booksize Compact				Cable for Motor Module Booksize Compact
1FK7100-3BC71-1□□□	1	4x1.5	6SL3420-1TE21-0AA0	9	18	53	6FX□002-5□G10-□□□□
1FK7101-3BC71-1□□□	1.5	4x1.5	6SL3420-1TE21-8AA0	18	27	80	6FX□002-5□G22-□□□□
1FK7101-3BF71-1□□□	1.5	4x2.5	6SL3420-1TE21-8AA0	18	26	72	6FX□002-5□G32-□□□□
1FK7103-3BC71-1□□□	1.5	4x1.5	6SL3420-1TE21-8AA0	18	36	108	6FX□002-5□G22-□□□□

Motors for SINAMICS S120 Combi			Modules S120 Combi				Cable for S120 Combi	
1FK7100-3BC71-1□□□	1	4x1.5	<i>several modules available, see documentation</i>		9	18	37	6FX□002-5□F10-□□□□
1FK7101-3BC71-1□□□	1.5	4x1.5			12	26,3	50,5	6FX□002-5□F14-□□□□

Motors for SINAMICS S110/S120 PM340			Power Module PM340				Cable for PM340
1FK7100-3BC71-1□□□	1	4x1.5	6SL3210-1SE21-0□A0	10.2	18	41,5	6FX□002-5□G10-□□□□
1FK7101-3BC71-1□□□	1.5	4x1.5	6SL3210-1SE21-8□A0	18	27	55	6FX□002-5□G22-□□□□
1FK7101-3BF71-1□□□	1.5	4x2.5	6SL3210-1SE22-5□A0	25	26	51,8	6FX□002-5□G32-□□□□
1FK7103-3BC71-1□□□	1.5	4x1.5	6SL3210-1SE21-8□A0	18	36	64,2	6FX□002-5□G22-□□□□
1FK7103-3BF71-1□□□	1.5	4x4	6SL3210-1SE23-2□A0	32	36	69,7	6FX□002-5□G42-□□□□
1FK7105-3BC71-1□□□	1.5	4x2.5	6SL3210-1SE22-5□A0	25	48	87,3	6FX□002-5□G32-□□□□

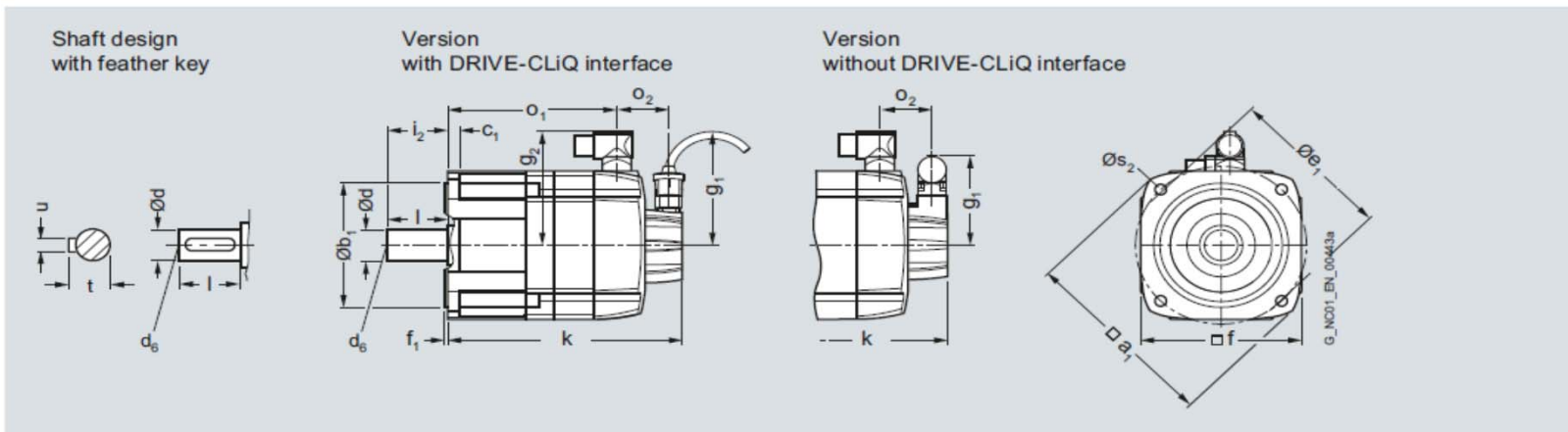
*) The current carrying capacity of the power cables complies with IEC 60204-1 for installation type C under continuous operating conditions at an ambient air temperature of 40 °C (104 °F), designed for I0 (100 K), PVC/PUR-insulated cable.

Feed motors für SINAMICS S120

Motors 1FK7 High Inertia
Natural cooling

Motor drawings

For motor		DQI encoder with DRIVE-CLiQ interface / Encoder system without DRIVE-CLiQ interface													
		Dimensions in mm (inches)													
Shaft height	Type	DIN IEC	a ₁ P	b ₁ N	c ₁ LA	e ₁ M	f AB	f ₁ T	i ₂ -	s ₂ S	Shaft extension DE				
		d	d ₆ -	l E	t GA	u F									
100	1FK710		245 (9.65)	180 (7.09)	13 (0.51)	215 (8.46)	192 (7.56)	4 (0.16)	80 (3.15)	14 (0.55)	38 (1.50)	M12	80 (3.15)	41 (1.61)	10 (0.39)

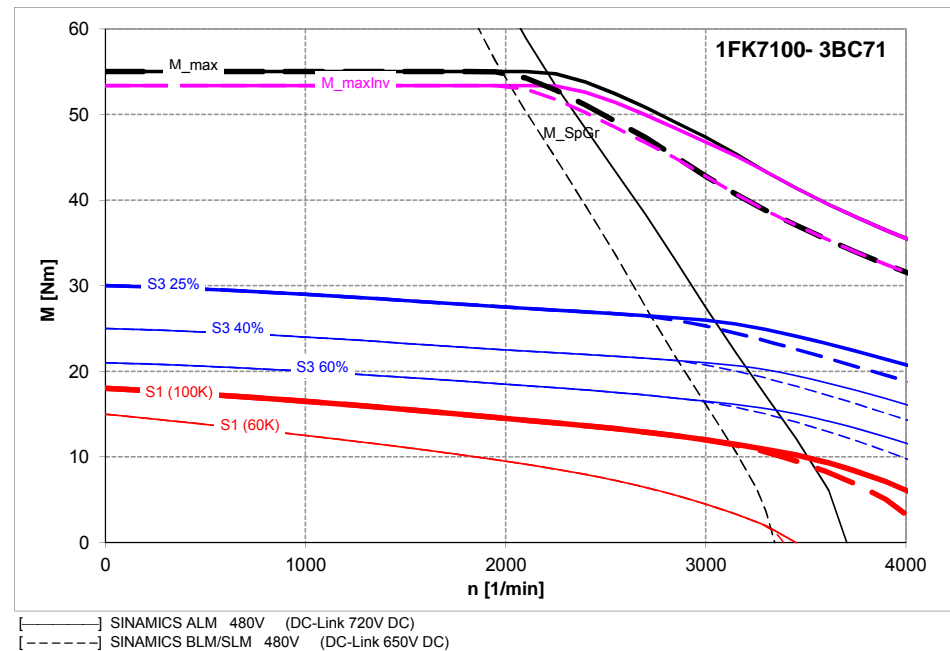
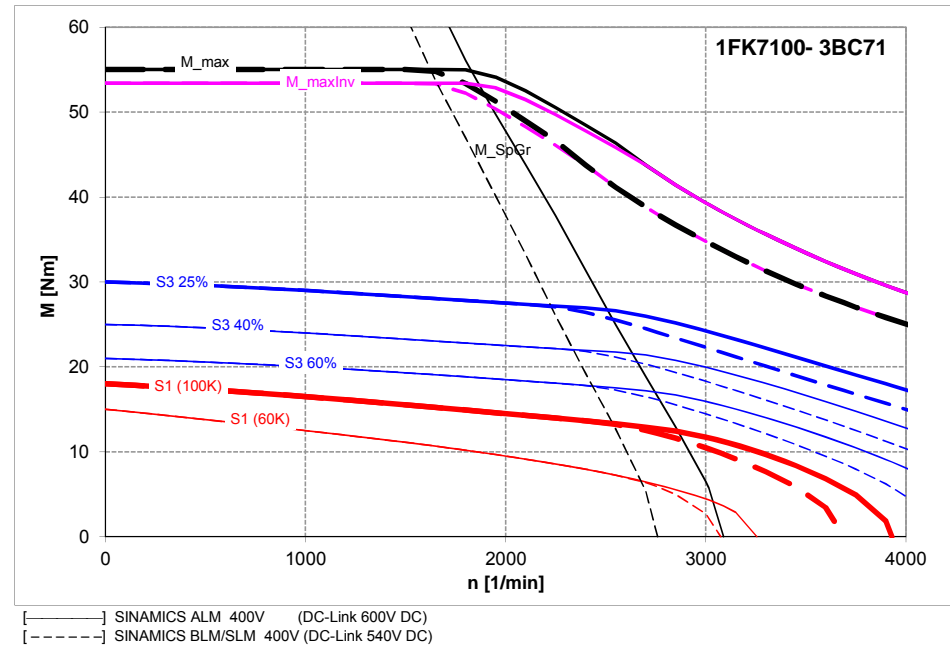


For motor		DQI encoder with DRIVE-CLiQ interface							Encoder system without DRIVE-CLiQ interface							
		Dimensions in mm (inches)														
Shaft height	Type	without brake				with brake			without brake				with brake			
		g ₁ -	g ₂ -	o ₂ -	k LB	o ₁ -	k LB	o ₁ -	g ₁ -	g ₂ -	o ₂ -	k LB	o ₁ -	k LB	o ₁ -	
1FK7 High Inertia																
100	1FK7100	104.5 (4.11)	137 (5.39)	53 (2.09)	183 (7.20)	118 (4.65)	220 (8.66)	170 (6.69)	93 (3.66)	137 (5.39)	55 (2.17)	188 (7.40)	118 (4.65)	225 (8.86)	170 (6.69)	
	1FK7101		158 (6.22)		209 (8.23)	144 (5.67)	261 (10.28)	196 (7.72)		158 (6.22)		214 (8.43)	144 (5.67)	266 (10.47)	196 (7.72)	
	1FK7103				235 (9.25)	170 (6.69)	287 (11.30)	222 (8.74)				240 (9.45)	170 (6.69)	292 (11.50)	222 (8.74)	
	1FK7105				287 (11.30)	222 (8.74)	339 (13.35)	274 (10.79)				292 (11.50)	222 (8.74)	344 (13.54)	274 (10.79)	

For 2D/3D CAD files, please see <http://www.siemens.de/cadcreator>

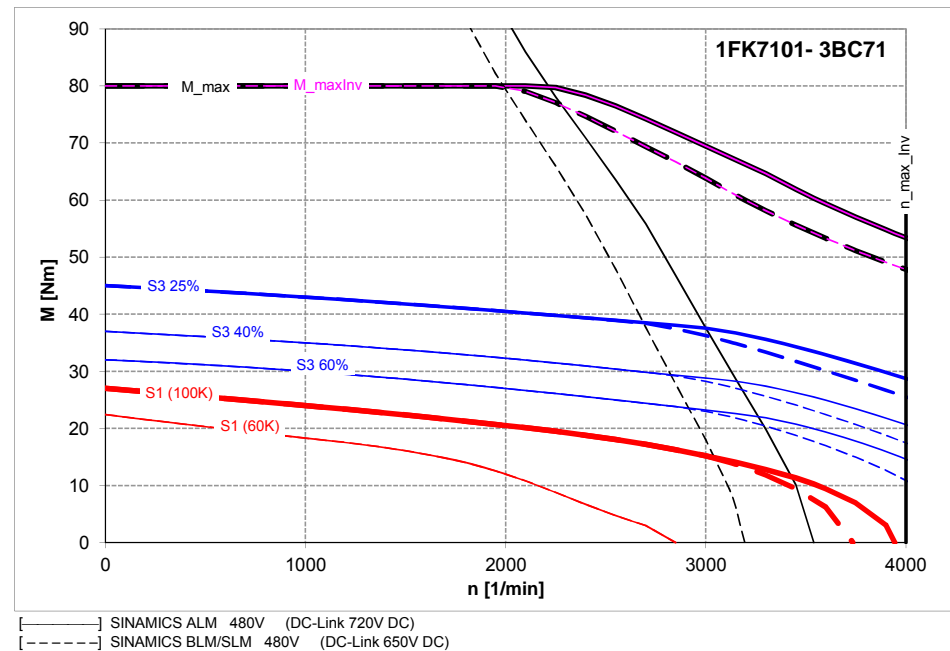
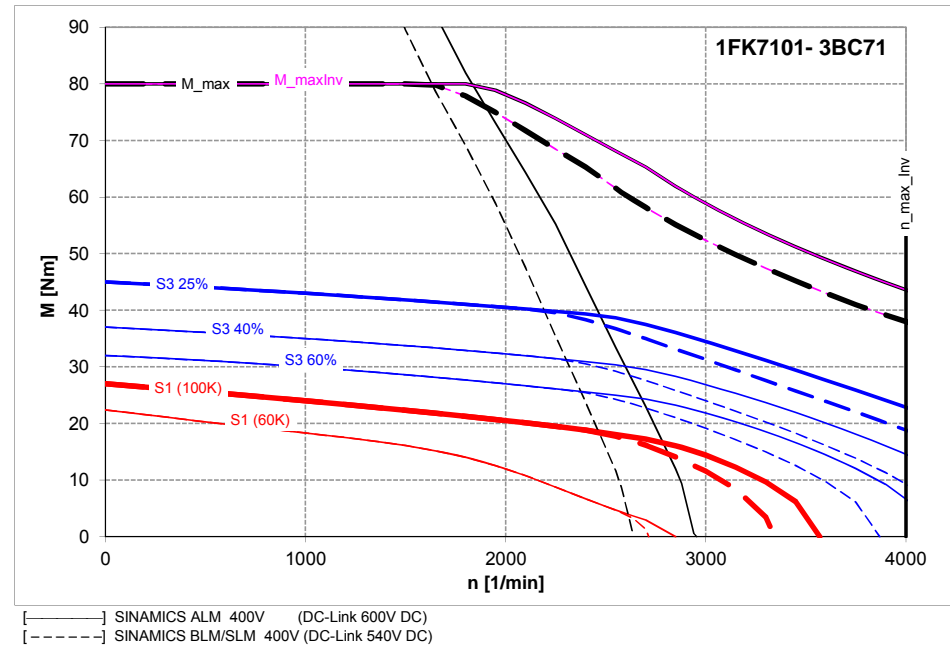
AC - servomotor 1FK7100- 3BC71			
Technical data	symbol	unit	value
Engineering data:			
Rated speed	n_N	1/min	2000
Rated torque (100K)	$M_{N(100K)}$	Nm	14.5
Rated current (100K)	$I_{N(100K)}$	A	7.1
Stall torque (100K)	$M_{0(100K)}$	Nm	18.0
Stall current (100K)	$I_{0(100K)}$	A	8.4
Stall torque (60K)	$M_{0(60K)}$	Nm	14.9
Stall current (60K)	$I_{0(60K)}$	A	6.8
Optimal operation point:			
Optimal speed	n_{opt}	1/min	2000
Optimal power	P_{opt}	kW	3.05
Limiting data:			
Maximum speed (mech.)	$n_{max\ mech}$	1/min	5000
Maximum torque	M_{max}	Nm	55
Maximum current	I_{max}	A	28.0
Motordata:			
Number of poles	2p		8
Torque constant (100K)	k_T	Nm/A	2.14
Voltage constant (at 20°C)	k_E	V/1000 min ⁻¹	138.0
Winding resistance (at 20°C)	R_{Str}	Ω	0.55
Inductance	L_D	mH	12.7
Electrical time constant	T_{el}	ms	23.0
Mechanical time constant	T_{mech}	ms	3.15
Thermal time constant	T_{th}	min	55
Moment of inertia	J_{Mot}	kgm ² · 10 ⁻⁴	87
Shaft torsional stiffness	C_t	Nm/rad	183000
Weight	m_{Mot}	kg	19.4
Motordata with integrated Brake:			
Moment of inertia (with Brake)	$J_{Mot\ mitBr}$	kgm ² · 10 ⁻⁴	95
Shaft torsional stiffness (with Brake)	$C_t\ mitBr$	Nm/rad	135000
Weight (with Brake)	$m_{Mot\ mitBr}$	kg	22.8
Data for SINAMICS S120 Booksize / S120 Booksize Compact			
Rated inverter current	$I_{N\ Inv}$	A	9
Maximum inverter current	$I_{max\ Inv}$	A	27
Maximum torque with inverter	$M_{max\ Inv}$	Nm	53.4
Maximum speed inverter	$n_{max\ Inv}$	1/min	4200

Rated data for 600V DC-Link



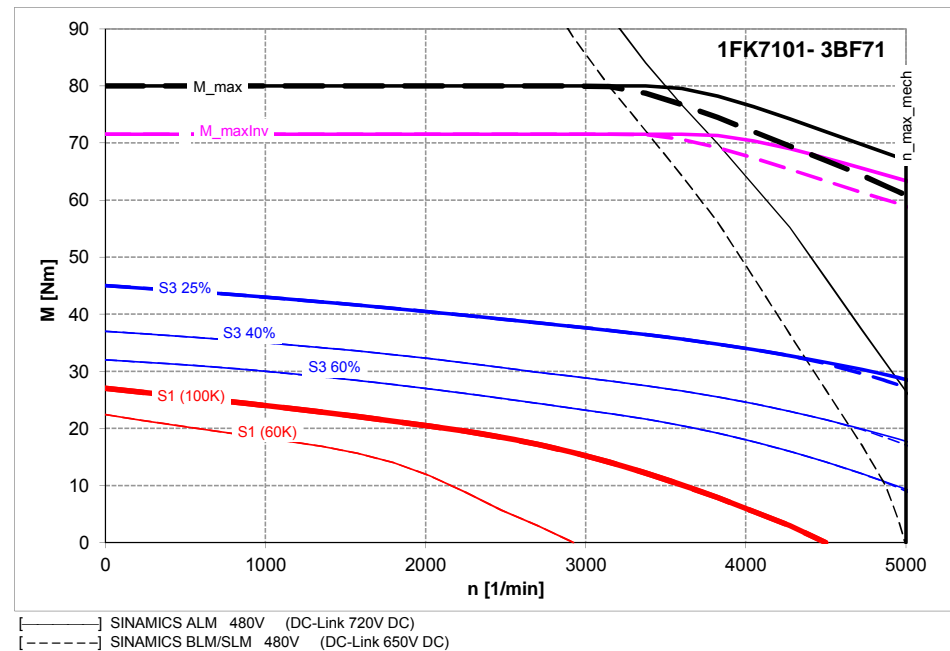
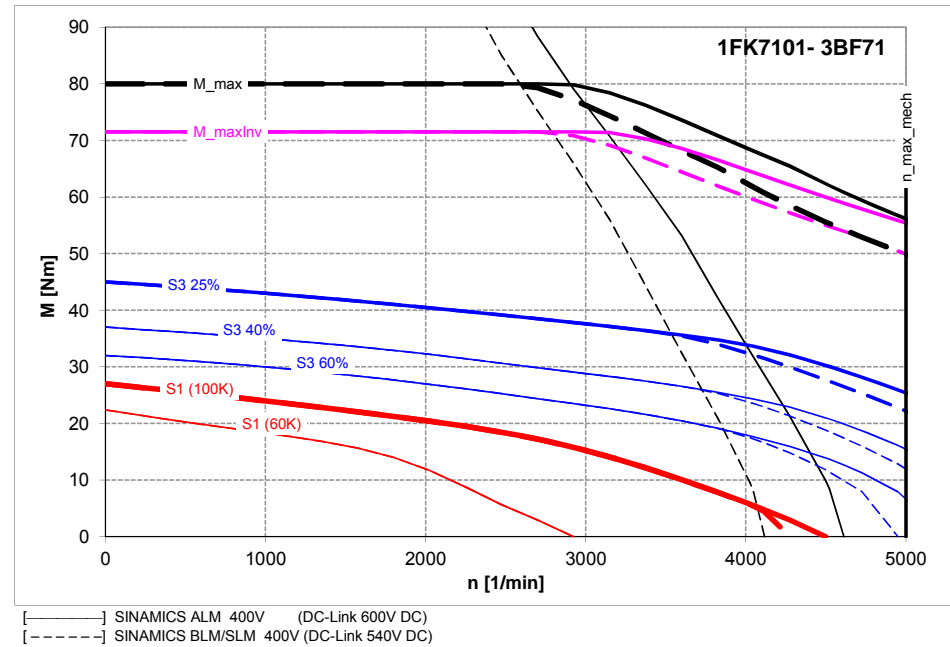
AC - servomotor 1FK7101- 3BC71			
Technical data	symbol	unit	value
Engineering data:			
Rated speed	n_N	1/min	2000
Rated torque (100K)	$M_{N(100K)}$	Nm	20.5
Rated current (100K)	$I_{N(100K)}$	A	9.7
Stall torque (100K)	$M_{0(100K)}$	Nm	27.0
Stall current (100K)	$I_{0(100K)}$	A	12,3
Stall torque (60K)	$M_{0(60K)}$	Nm	22.5
Stall current (60K)	$I_{0(60K)}$	A	10,0
Optimal operation point:			
Optimal speed	n_{opt}	1/min	2000
Optimal power	P_{opt}	kW	4.3
Limiting data:			
Maximum speed (mech.)	$n_{max\ mech}$	1/min	5000
Maximum torque	M_{max}	Nm	80
Maximum current	I_{max}	A	40.5
Motordata:			
Number of poles	2p		8
Torque constant (100K)	k_T	Nm/A	2,15
Voltage constant (at 20°C)	k_E	V/1000 min ⁻¹	144.5
Winding resistance (at 20°C)	R_{Str}	Ω	0.343
Inductance	L_D	mH	8.5
Electrical time constant	T_{el}	ms	25.0
Mechanical time constant	T_{mech}	ms	2.60
Thermal time constant	T_{th}	min	60
Moment of inertia	J_{Mot}	kgm ² · 10 ⁻⁴	127
Shaft torsional stiffness	C_t	Nm/rad	164000
Weight	m_{Mot}	kg	25.7
Motordata with integrated Brake:			
Moment of inertia (with Brake)	$J_{Mot\ mitBr}$	kgm ² · 10 ⁻⁴	136
Shaft torsional stiffness (with Brake)	$C_t\ mitBr$	Nm/rad	116000
Weight (with Brake)	$m_{Mot\ mitBr}$	kg	30.2
Data for SINAMICS S120 Booksize / S120 Booksize Compact			
Rated inverter current	$I_{N\ Inv}$	A	18
Maximum inverter current	$I_{max\ Inv}$	A	54
Maximum torque with inverter	$M_{max\ Inv}$	Nm	80
Maximum speed inverter	$n_{max\ Inv}$	1/min	4000

Rated data for 600V DC-Link



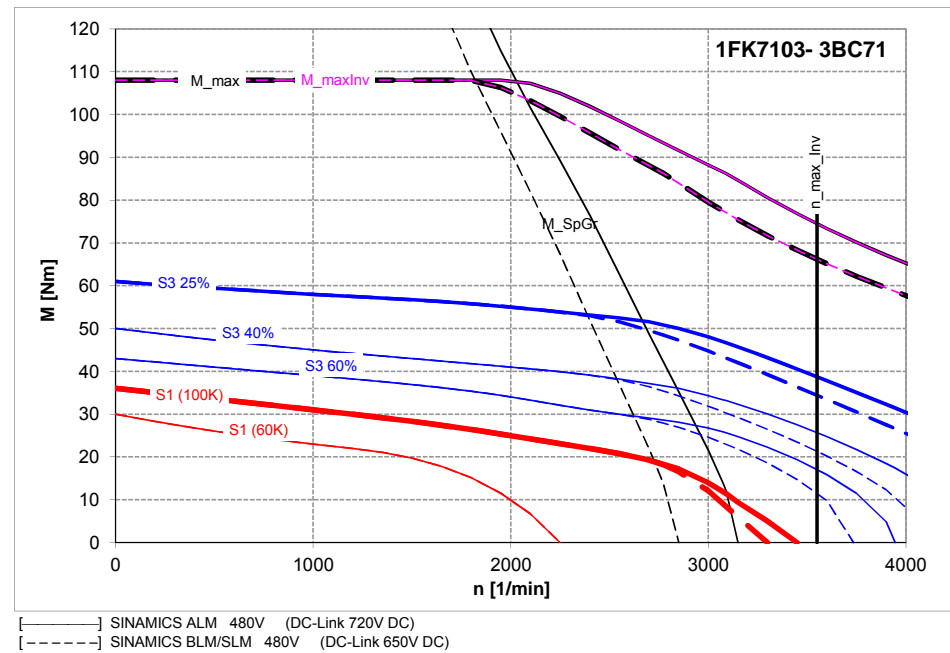
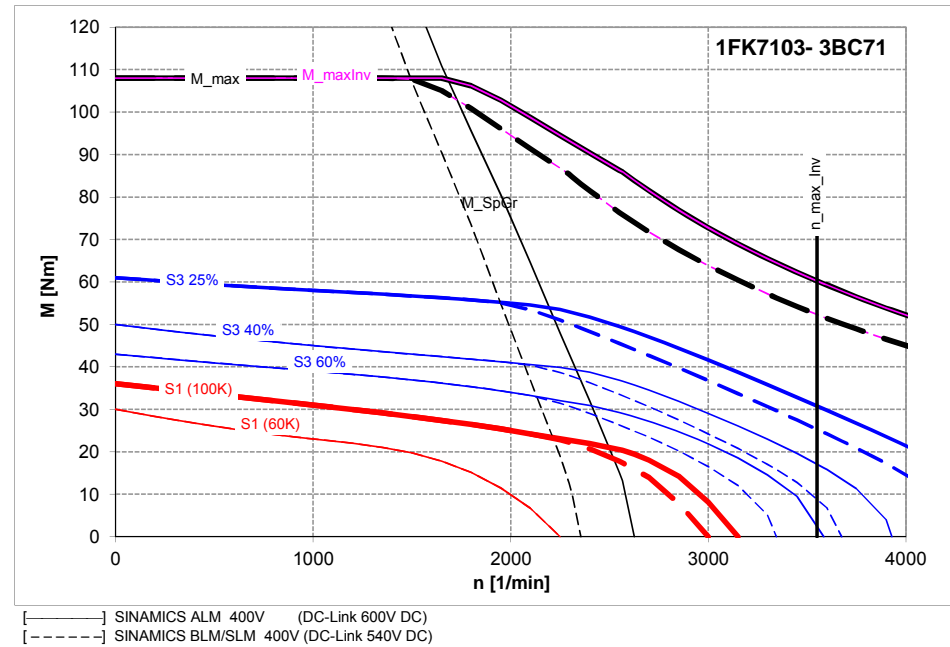
AC - servomotor 1FK7101- 3BF71			
Technical data	symbol	unit	value
Engineering data:			
Rated speed	n_N	1/min	3000
Rated torque (100K)	$M_{N(100K)}$	Nm	15.5
Rated current (100K)	$I_{N(100K)}$	A	11.6
Stall torque (100K)	$M_{0(100K)}$	Nm	27.0
Stall current (100K)	$I_{0(100K)}$	A	18.8
Stall torque (60K)	$M_{0(60K)}$	Nm	22.5
Stall current (60K)	$I_{0(60K)}$	A	15.2
Optimal operation point:			
Optimal speed	n_{opt}	1/min	3000
Optimal power	P_{opt}	kW	4.85
Limiting data:			
Maximum speed (mech.)	$n_{max\ mech}$	1/min	5000
Maximum torque	M_{max}	Nm	80
Maximum current	I_{max}	A	63
Motordata:			
Number of poles	2p		8
Torque constant (100K)	k_T	Nm/A	1.435
Voltage constant (at 20°C)	k_E	V/1000 min ⁻¹	92.5
Winding resistance (at 20°C)	R_{Str}	Ω	0.141
Inductance	L_D	mH	3.5
Electrical time constant	T_{el}	ms	25.0
Mechanical time constant	T_{mech}	ms	2.61
Thermal time constant	T_{th}	min	60
Moment of inertia	J_{Mot}	kgm ² · 10 ⁻⁴	127
Shaft torsional stiffness	C_t	Nm/rad	164000
Weight	m_{Mot}	kg	25.7
Motordata with integrated Brake:			
Moment of inertia (with Brake)	$J_{Mot\ mitBr}$	kgm ² · 10 ⁻⁴	136
Shaft torsional stiffness (with Brake)	$C_t\ mitBr$	Nm/rad	116000
Weight (with Brake)	$m_{Mot\ mitBr}$	kg	30.2
Data for SINAMICS S120 Booksize / S120 Booksize Compact			
Rated inverter current	$I_{N\ Inv}$	A	18
Maximum inverter current	$I_{max\ Inv}$	A	54
Maximum torque with inverter	$M_{max\ Inv}$	Nm	72
Maximum speed inverter	$n_{max\ Inv}$	1/min	5000

Rated data for 600V DC-Link



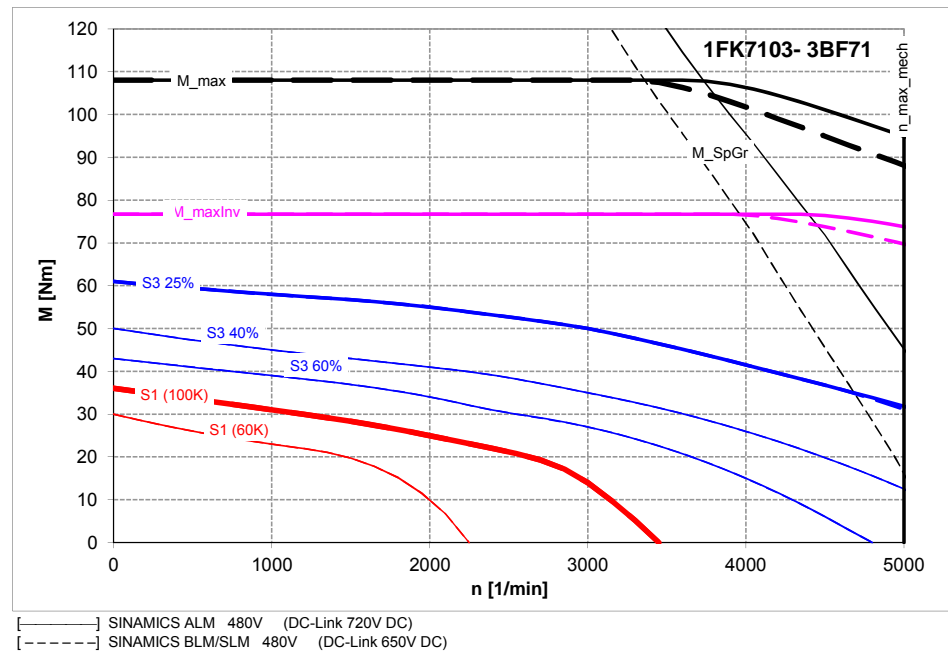
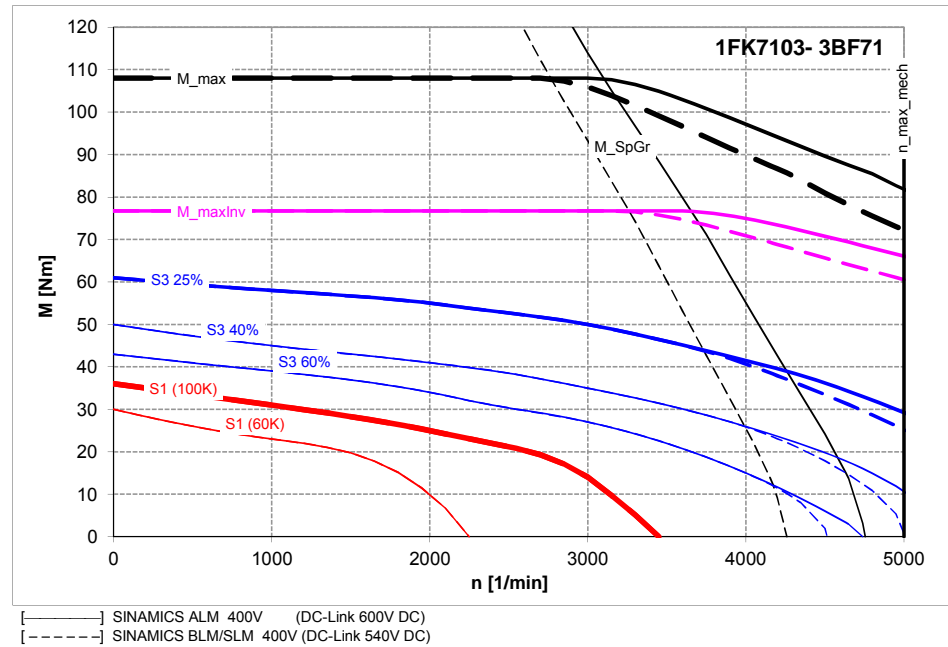
AC - servomotor 1FK7103- 3BC71			
Technical data	symbol	unit	value
Engineering data:			
Rated speed	n_N	1/min	2000
Rated torque (100K)	$M_{N(100K)}$	Nm	25.0
Rated current (100K)	$I_{N(100K)}$	A	11.0
Stall torque (100K)	$M_{0(100K)}$	Nm	36.0
Stall current (100K)	$I_{0(100K)}$	A	14.4
Stall torque (60K)	$M_{0(60K)}$	Nm	30.0
Stall current (60K)	$I_{0(60K)}$	A	11.6
Optimal operation point:			
Optimal speed	n_{opt}	1/min	2000
Optimal power	P_{opt}	kW	5.2
Limiting data:			
Maximum speed (mech.)	$n_{max\ mech}$	1/min	5000
Maximum torque	M_{max}	Nm	108
Maximum current	I_{max}	A	46.5
Motordata:			
Number of poles	2p		8
Torque constant (100K)	k_T	Nm/A	2,45
Voltage constant (at 20°C)	k_E	V/1000 min ⁻¹	162.0
Winding resistance (at 20°C)	R_{Str}	Ω	0.288
Inductance	L_D	mH	7.9
Electrical time constant	T_{el}	ms	27.5
Mechanical time constant	T_{mech}	ms	2.42
Thermal time constant	T_{th}	min	65
Moment of inertia	J_{Mot}	kgm ² · 10 ⁻⁴	168
Shaft torsional stiffness	C_t	Nm/rad	148000
Weight	m_{Mot}	kg	32.1
Motordata with integrated Brake:			
Moment of inertia (with Brake)	$J_{Mot\ mitBr}$	kgm ² · 10 ⁻⁴	176
Shaft torsional stiffness (with Brake)	$C_t\ mitBr$	Nm/rad	108000
Weight (with Brake)	$m_{Mot\ mitBr}$	kg	36.6
Data for SINAMICS S120 Booksize / S120 Booksize Compact			
Rated inverter current	$I_{N\ Inv}$	A	18
Maximum inverter current	$I_{max\ Inv}$	A	54
Maximum torque with inverter	$M_{max\ Inv}$	Nm	108
Maximum speed inverter	$n_{max\ Inv}$	1/min	3550

Rated data for 600V DC-Link



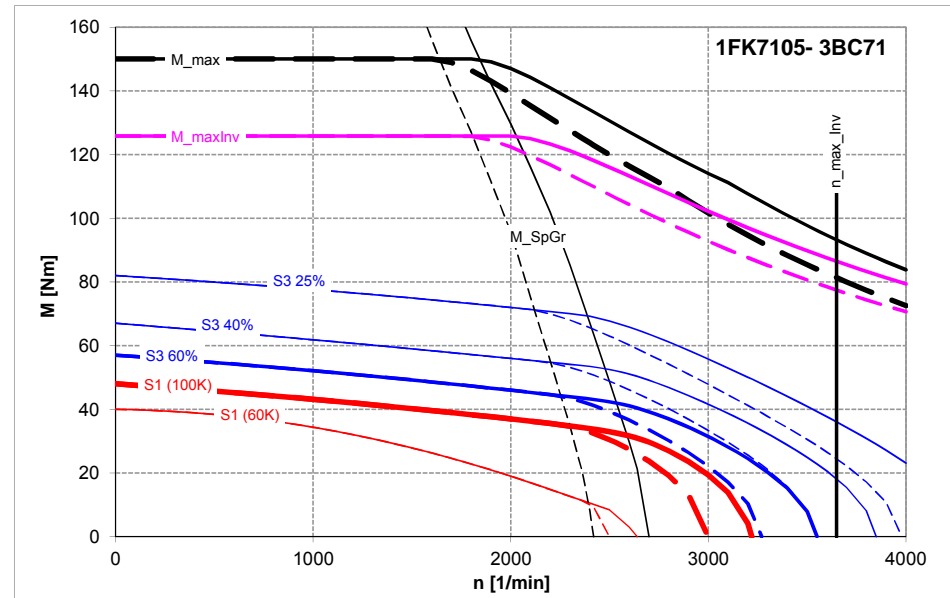
AC - servomotor 1FK7103- 3BF71			
Technical data	symbol	unit	value
Engineering data:			
Rated speed	n_N	1/min	3000
Rated torque (100K)	$M_{N(100K)}$	Nm	14.0
Rated current (100K)	$I_{N(100K)}$	A	11.5
Stall torque (100K)	$M_{0(100K)}$	Nm	36.0
Stall current (100K)	$I_{0(100K)}$	A	26.0
Stall torque (60K)	$M_{0(60K)}$	Nm	30.0
Stall current (60K)	$I_{0(60K)}$	A	21.0
Optimal operation point:			
Optimal speed	n_{opt}	1/min	2500
Optimal power	P_{opt}	kW	5.4
Limiting data:			
Maximum speed (mech.)	$n_{max\ mech}$	1/min	5000
Maximum torque	M_{max}	Nm	108
Maximum current	I_{max}	A	84
Motordata:			
Number of poles	2p		8
Torque constant (100K)	k_T	Nm/A	1.385
Voltage constant (at 20°C)	k_E	V/1000 min ⁻¹	89.5
Winding resistance (at 20°C)	R_{Str}	Ω	0.0895
Inductance	L_D	mH	2.4
Electrical time constant	T_{el}	ms	27.0
Mechanical time constant	T_{mech}	ms	2.35
Thermal time constant	T_{th}	min	65
Moment of inertia	J_{Mot}	kgm ² · 10 ⁻⁴	168
Shaft torsional stiffness	C_t	Nm/rad	148000
Weight	m_{Mot}	kg	32.1
Motordata with integrated Brake:			
Moment of inertia (with Brake)	$J_{Mot\ mitBr}$	kgm ² · 10 ⁻⁴	176
Shaft torsional stiffness (with Brake)	$C_t\ mitBr$	Nm/rad	108000
Weight (with Brake)	$m_{Mot\ mitBr}$	kg	36.6
Data for SINAMICS S120 Booksize / S120 Booksize Compact			
Rated inverter current	$I_{N\ Inv}$	A	30
Maximum inverter current	$I_{max\ Inv}$	A	56
Maximum torque with inverter	$M_{max\ Inv}$	Nm	77
Maximum speed inverter	$n_{max\ Inv}$	1/min	5000

Rated data for 600V DC-Link

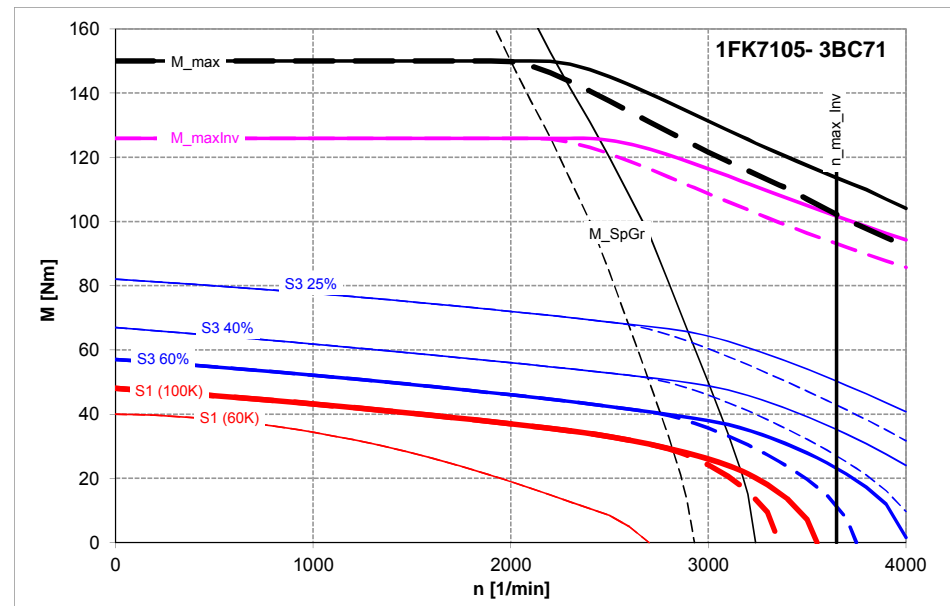


AC - servomotor 1FK7105- 3BC71			
Technical data	symbol	unit	value
Engineering data:			
Rated speed	n_N	1/min	2000
Rated torque (100K)	$M_{N(100K)}$	Nm	37.0
Rated current (100K)	$I_{N(100K)}$	A	16.0
Stall torque (100K)	$M_{0(100K)}$	Nm	48.0
Stall current (100K)	$I_{0(100K)}$	A	20.0
Stall torque (60K)	$M_{0(60K)}$	Nm	40.0
Stall current (60K)	$I_{0(60K)}$	A	16.2
Optimal operation point:			
Optimal speed	n_{opt}	1/min	2000
Optimal power	P_{opt}	kW	7.7
Limiting data:			
Maximum speed (mech.)	$n_{max\ mech}$	1/min	5000
Maximum torque	M_{max}	Nm	150
Maximum current	I_{max}	A	71
Motordata:			
Number of poles	2p		8
Torque constant (100K)	k_T	Nm/A	2,37
Voltage constant (at 20°C)	k_E	V/1000 min ⁻¹	157.5
Winding resistance (at 20°C)	R_{Str}	Ω	0.175
Inductance	L_D	mH	4,5
Electrical time constant	T_{el}	ms	25,5
Mechanical time constant	T_{mech}	ms	2.33
Thermal time constant	T_{th}	min	70
Moment of inertia	J_{Mot}	kgm ² · 10 ⁻⁴	249
Shaft torsional stiffness	C_t	Nm/rad	125000
Weight	m_{Mot}	kg	44.4
Motordata with integrated Brake:			
Moment of inertia (with Brake)	$J_{Mot\ mitBr}$	kgm ² · 10 ⁻⁴	258
Shaft torsional stiffness (with Brake)	$C_t\ mitBr$	Nm/rad	95000
Weight (with Brake)	$m_{Mot\ mitBr}$	kg	48.9
Data for SINAMICS S120 Booksize / S120 Booksize Compact			
Rated inverter current	$I_{N\ Inv}$	A	30
Maximum inverter current	$I_{max\ Inv}$	A	56
Maximum torque with inverter	$M_{max\ Inv}$	Nm	126
Maximum speed inverter	$n_{max\ Inv}$	1/min	3650

Rated data for 600V DC-Link



[———] SINAMICS ALM 400V (DC-Link 600V DC)
 [- - - -] SINAMICS BLM/SLM 400V (DC-Link 540V DC)



[———] SINAMICS ALM 480V (DC-Link 720V DC)
 [- - - -] SINAMICS BLM/SLM 480V (DC-Link 650V DC)