CMZ

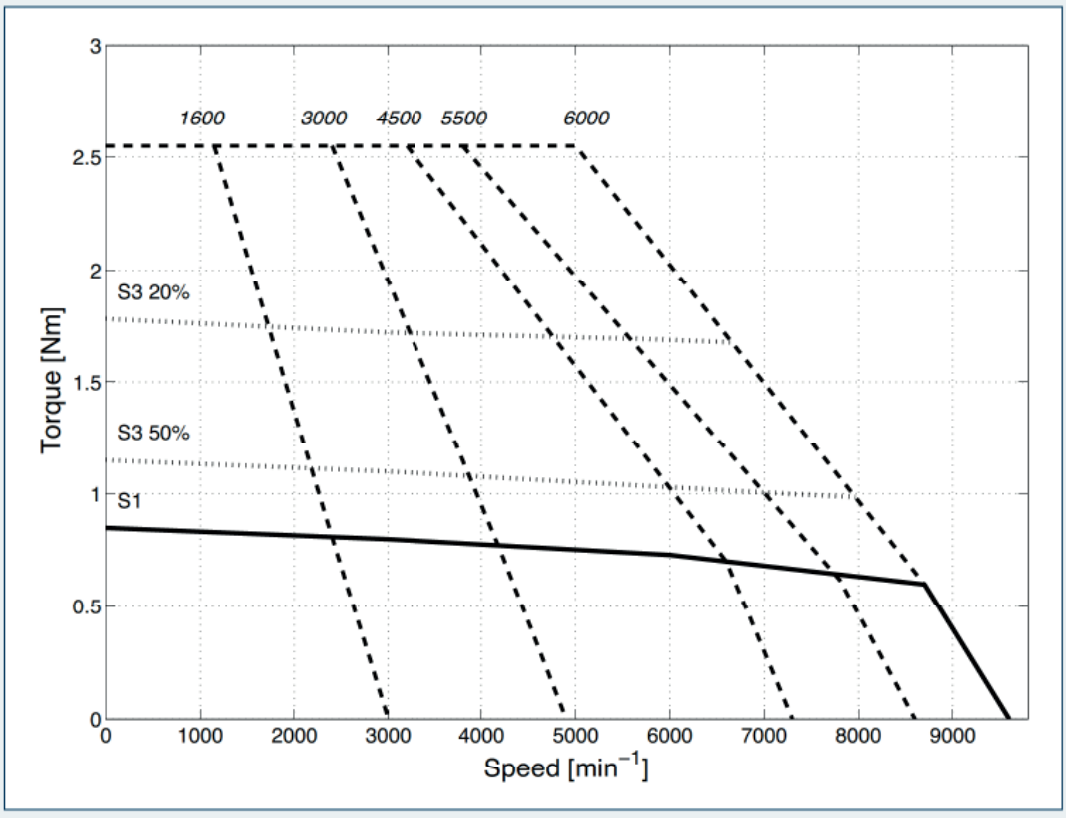
Solutions in *motion*

MMD series

Intelligence Production Movement

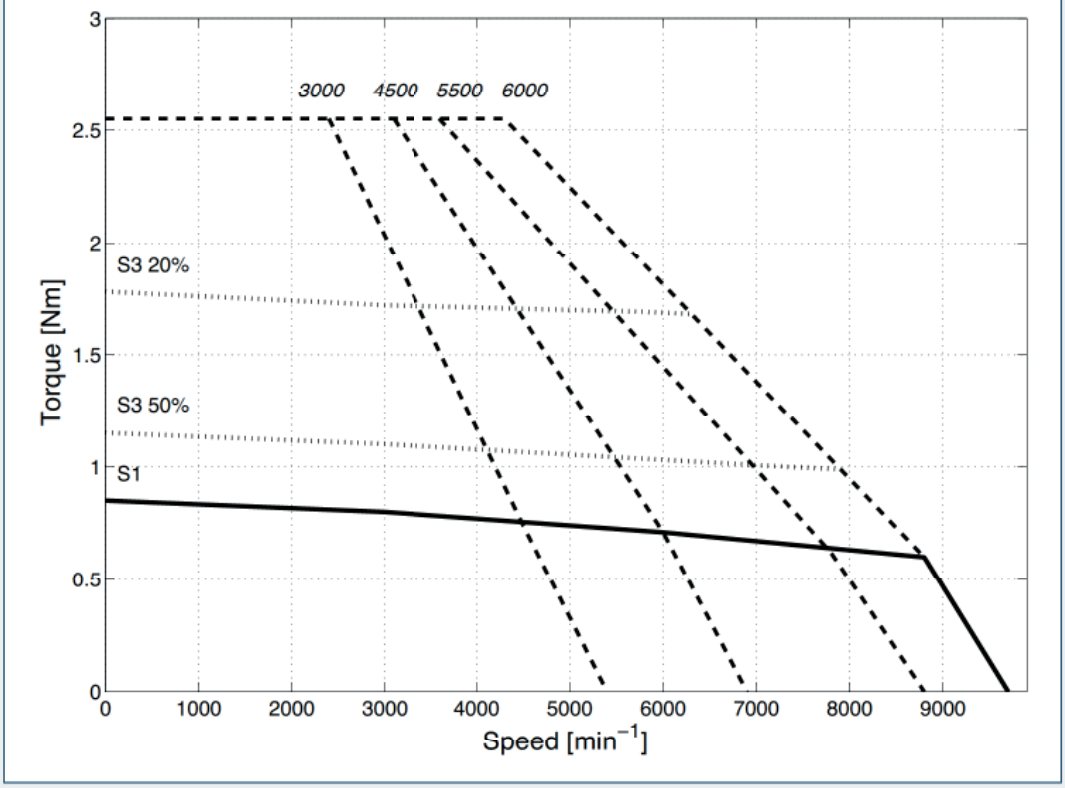
MMD 65 • 0.85 Nm - 230V

Parameter	Symbol	Unit	Speed [min^{-1}]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]			0.85		
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	168	181	172	179	177
Rated Torque (dT=105K)	M_n	[Nm]	0.83	0.80	0.76	0.74	0.73
Current at rated speed	I_n	[A]	0.74	1.16	1.74	1.92	2.09
Standstill current	I_0	[A]	0.77	1.23	1.93	2.18	2.39
Max Torque	M_{max}	[Nm]	2.55	2.55	2.55	2.55	2.55
Max Current	I_{max}	[A]	2.5	3.9	6.2	7.0	7.7
Back EMF constant	K_e	[V/1000min^{-1}]	75	47	30	27	24
Torque constant	K_T	[Nm/A]	1.10	0.69	0.44	0.39	0.36
Rated Power	P_n	[kW]	0.14	0.25	0.36	0.43	0.46
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	48.4	19.2	7.75	6.10	5.04
Stator phase-phase Inductance	L_{pp}	[mH]	145	57.5	23.2	18.3	15.1
Rotor inertia	J_m	[kgm^2 x 10^{-4}]			0.2		
Electric time constant (at 20°C)	τ_{el}	[ms]			3.0		
Thermal time constant	τ_{therm}	[min]			14		
Motor mass without brake	m_M	[kg]			1.3		
Motor mass with brake	m_{MB}	[kg]			1.5		



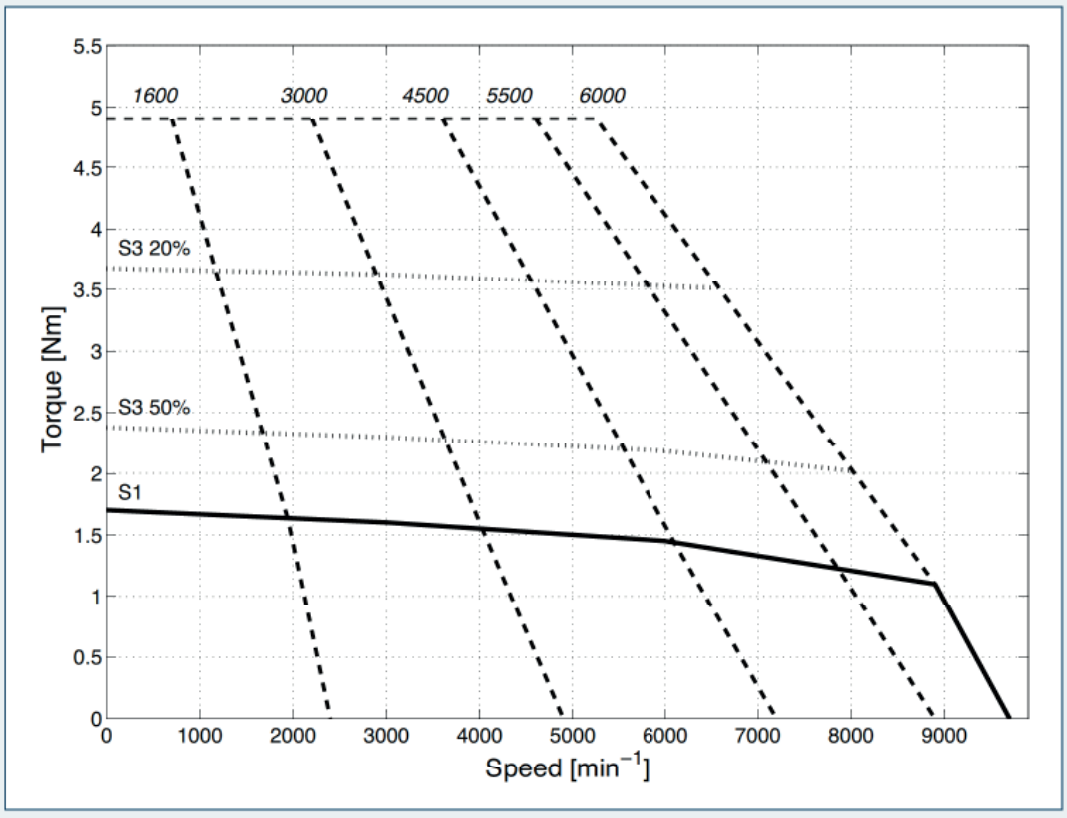
MMD 65 • 0.85 Nm - 400V

Parameter	Symbol	Unit	Speed [min^{-1}]			
			3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]	0.85			
Motor rated frequency	f_n	[Hz]	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	295	331	318	306
Rated Torque (dT=105K)	M_n	[Nm]	0.80	0.76	0.74	0.73
Current at rated speed	I_n	[A]	0.72	0.88	1.08	1.21
Standstill current	I_0	[A]	0.76	0.98	1.23	1.38
Max Torque	M_{max}	[Nm]	2.55	2.55	2.55	2.55
Max Current	I_{max}	[A]	2.43	3.1	3.9	4.4
Back EMF constant	K_e	[V/1000min^{-1}]	76	59	47	42
Torque constant	K_T	[Nm/A]	1.12	0.87	0.69	0.62
Rated Power	P_n	[kW]	0.25	0.36	0.43	0.46
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	50.0	30.3	19.2	15.1
Stator phase-phase Inductance	L_{pp}	[mH]	150	90.7	57.5	45.2
Rotor inertia	J_m	[kgm² x 10^{-4}]	0.2			
Electric time constant (at 20°C)	τ_{el}	[ms]	3.0			
Thermal time constant	τ_{therm}	[min]	14			
Motor mass without brake	m_M	[kg]	1.3			
Motor mass with brake	m_{MB}	[kg]	1.5			



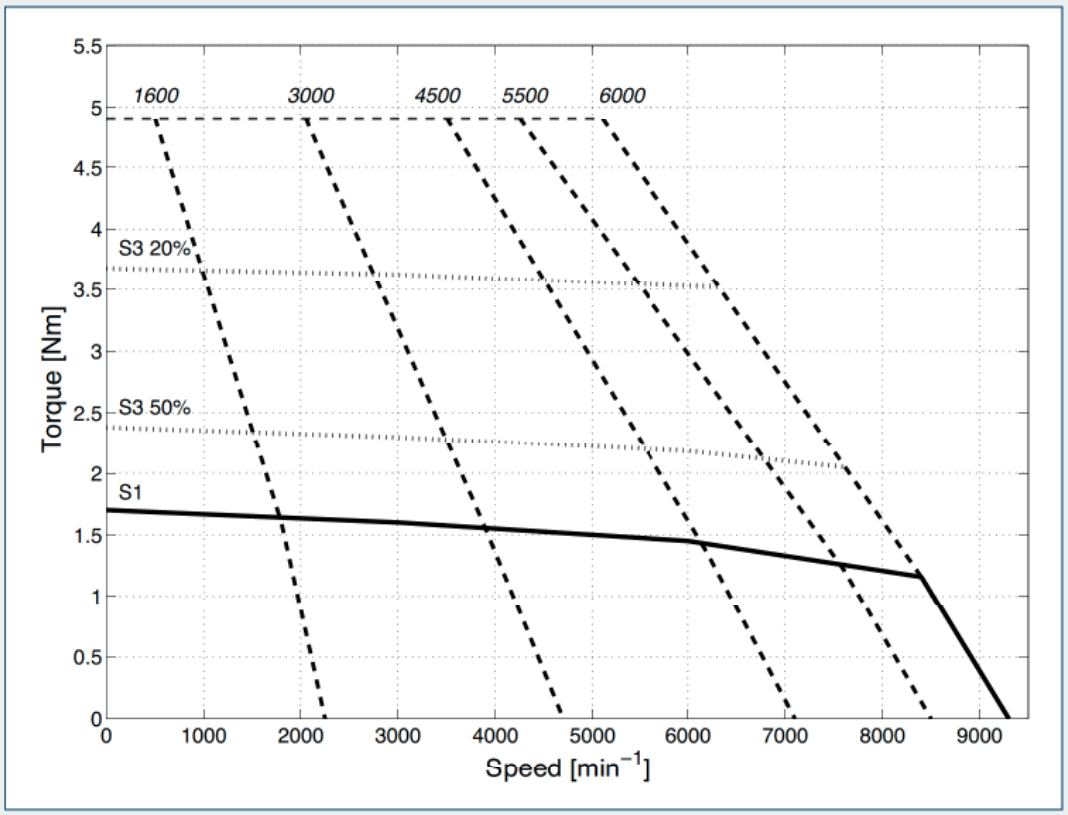
MMD 65 • 1.7 Nm - 230V

Parameter	Symbol	Unit	Speed [min^{-1}]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]	1.7				
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	193	180	180	174	171
Rated Torque (dT=105K)	M_n	[Nm]	1.65	1.60	1.52	1.48	1.45
Current at rated speed	I_n	[A]	1.25	2.30	3.2	3.9	4.2
Standstill current	I_0	[A]	1.26	2.34	3.4	4.2	4.7
Max Torque	M_{max}	[Nm]	4.9	4.9	4.9	4.9	4.9
Max Current	I_{max}	[A]	4.3	8.0	11.5	14.5	15.9
Back EMF constant	K_e	[V/1000min^{-1}]	89	48	33	26	24
Torque constant	K_T	[Nm/A]	1.35	0.73	0.50	0.40	0.36
Rated Power	P_n	[kW]	0.28	0.50	0.72	0.85	0.91
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	30.4	8.79	4.19	2.66	2.20
Stator phase-phase Inductance	L_{pp}	[mH]	91.9	26.6	12.6	8.0	6.6
Rotor inertia	J_m	[kgm² x 10^{-4}]	0.4				
Electric time constant (at 20°C)	τ_{el}	[ms]	3.0				
Thermal time constant	τ_{therm}	[min]	20				
Motor mass without brake	m_M	[kg]	1.9				
Motor mass with brake	m_{MB}	[kg]	2.1				



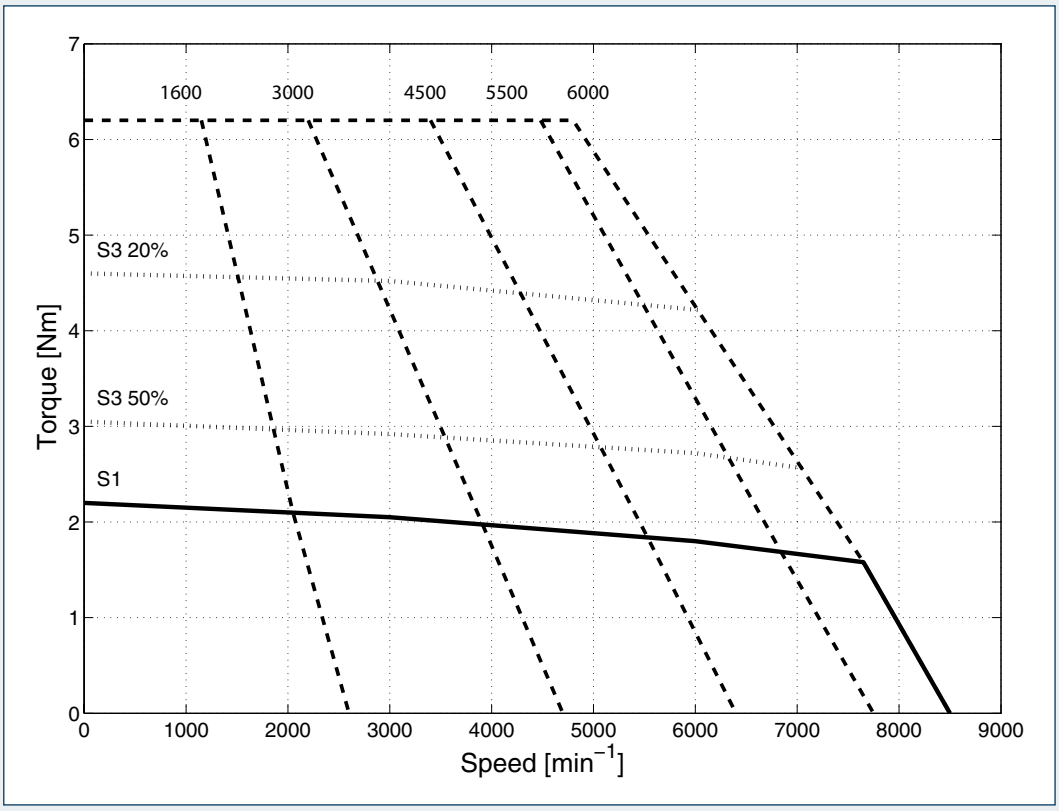
MMD 65 • 1.7 Nm - 400V

Parameter	Symbol	Unit	Speed [min^{-1}]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]	1.7				
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	336	311	308	316	300
Rated Torque (dT=105K)	M_n	[Nm]	1.65	1.60	1.52	1.48	1.45
Current at rated speed	I_n	[A]	0.72	1.33	1.85	2.14	2.43
Standstill current	I_0	[A]	0.72	1.35	1.98	2.34	2.68
Max Torque	M_{max}	[Nm]	4.9	4.9	4.9	4.9	4.9
Max Current	I_{max}	[A]	2.46	4.6	6.7	8.0	9.1
Back EMF constant	K_e	[V/1000min^{-1}]	155	83	57	48	42
Torque constant	K_T	[Nm/A]	2.36	1.26	0.86	0.73	0.63
Rated Power	P_n	[kW]	0.28	0.50	0.72	0.85	0.91
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	92.3	26.3	12.2	8.79	6.65
Stator phase-phase Inductance	L_{pp}	[mH]	279	79.5	37.0	26.6	20.1
Rotor inertia	J_m	[kgm² x 10^{-4}]	0.4				
Electric time constant (at 20°C)	τ_{el}	[ms]	3.0				
Thermal time constant	τ_{therm}	[min]	20				
Motor mass without brake	m_M	[kg]	1.9				
Motor mass with brake	m_{MB}	[kg]	2.1				



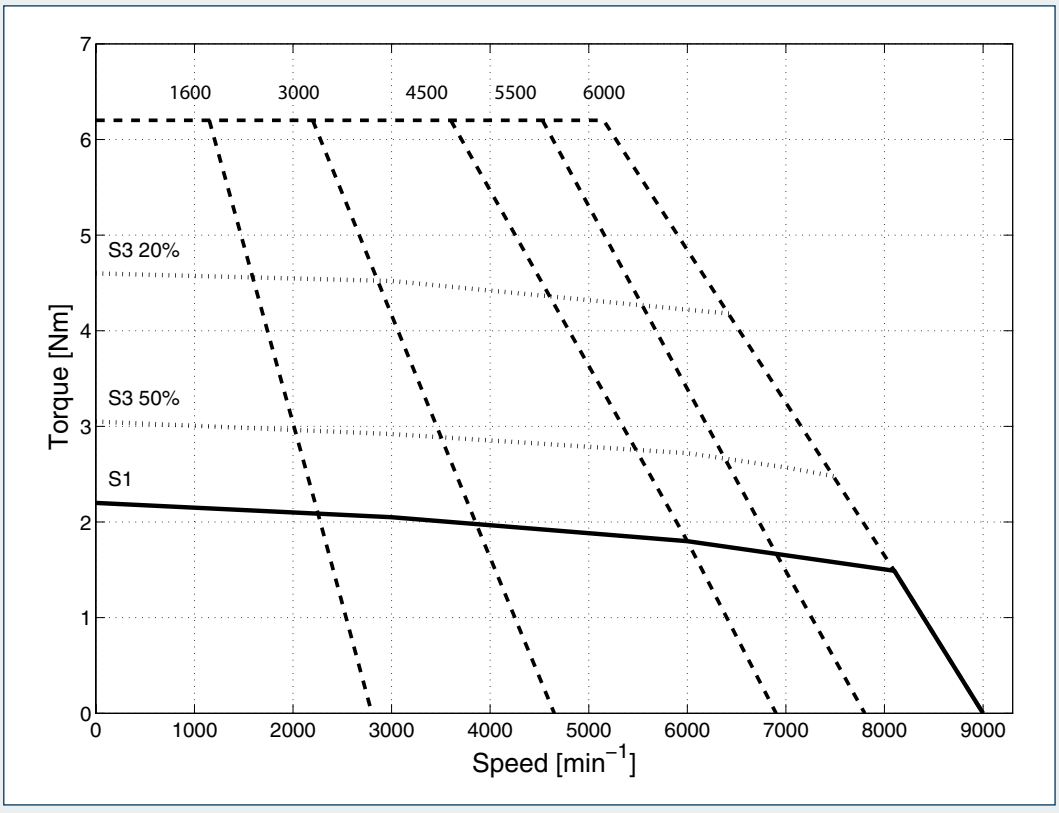
MMD 65 • 2.2 Nm - 230V

Parameter	Symbol	Unit	Speed [min $^{-1}$]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]	2.2				
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	179	180	191	192	190
Rated Torque (dT=105K)	M_n	[Nm]	2.12	2.05	1.95	1.85	1.80
Current at rated speed	I_n	[A]	1.65	2.78	3.6	4.1	4.4
Standstill current	I_0	[A]	1.70	2.96	4.1	4.9	5.4
Max Torque	M_{max}	[Nm]	6.2	6.2	6.2	6.2	6.2
Max Current	I_{max}	[A]	5.4	9.4	12.9	15.6	17.1
Back EMF constant	K_e	[V/1000min $^{-1}$]	90	52	38	31	28
Torque constant	K_T	[Nm/A]	1.29	0.74	0.54	0.45	0.41
Rated Power	P_n	[kW]	0.36	0.64	0.92	1.07	1.13
Stator phase-phase Resistance (at 20°C)	R_{pp}	[W]	18.8	6.21	3.27	2.26	1.86
Stator phase-phase Inductance	L_{pp}	[mH]	56.9	18.8	9.9	6.8	5.6
Rotor inertia	J_m	[kgm ^{2} x 10 $^{-4}$]	0.6				
Electric time constant (at 20°C)	t_{el}	[ms]	3.0				
Thermal time constant	t_{therm}	[min]	26				
Motor mass without brake	m_M	[kg]	2.6				
Motor mass with brake	m_{MB}	[kg]	2.8				



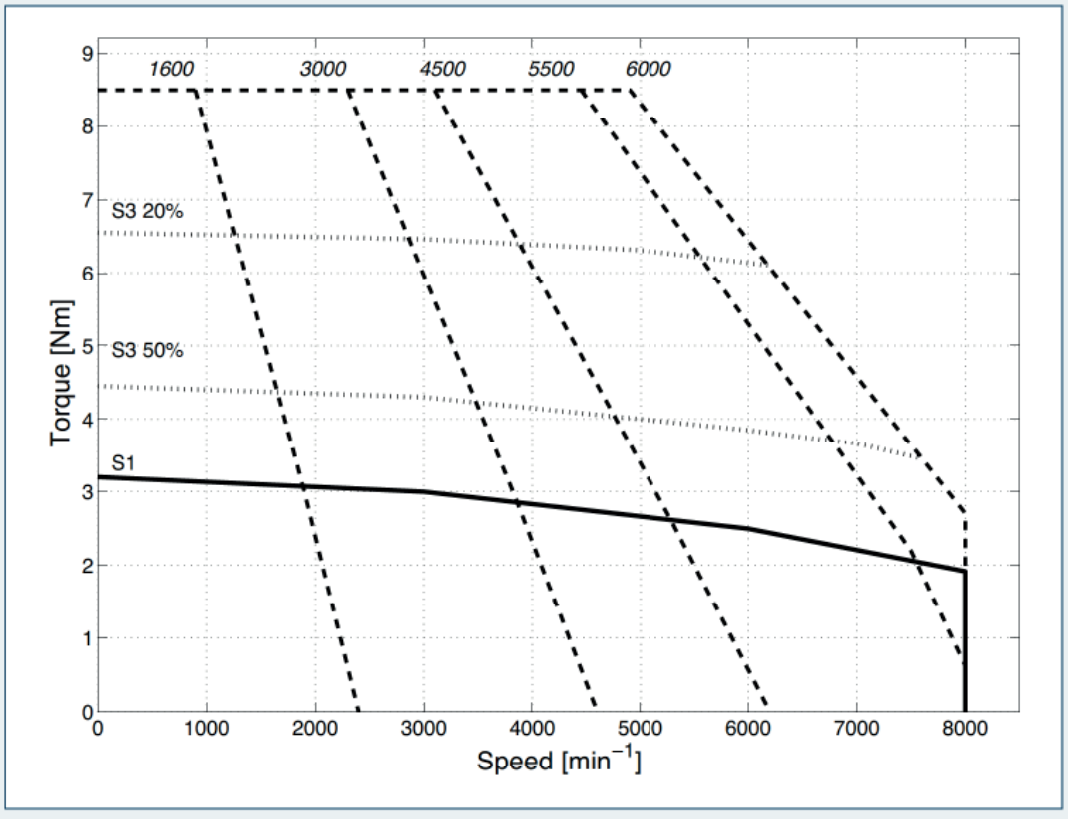
MMD 65 • 2.2 Nm - 400V

Parameter	Symbol	Unit	Speed [min $^{-1}$]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]	2.2				
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	285	314	314	328	313
Rated Torque (dT=105K)	M_n	[Nm]	2.12	2.05	1.95	1.85	1.80
Current at rated speed	I_n	[A]	1.04	1.60	2.20	2.41	2.68
Standstill current	I_0	[A]	1.07	1.70	2.48	2.88	3.27
Max Torque	M_{max}	[Nm]	6.2	6.2	6.2	6.2	6.2
Max Current	I_{max}	[A]	3.4	5.4	7.9	9.1	10.4
Back EMF constant	K_e	[V/1000min $^{-1}$]	143	90	62	53	47
Torque constant	K_T	[Nm/A]	2.06	1.29	0.89	0.76	0.67
Rated Power	P_n	[kW]	0.36	0.64	0.92	1.07	1.13
Stator phase-phase Resistance (at 20°C)	R_{pp}	[W]	47.6	18.8	8.82	6.56	5.08
Stator phase-phase Inductance	L_{pp}	[mH]	144	56.9	26.7	19.8	15.4
Rotor inertia	J_m	[kgm ^{2} x 10 $^{-4}$]	0.6				
Electric time constant (at 20°C)	t_{el}	[ms]	3.0				
Thermal time constant	t_{therm}	[min]	26				
Motor mass without brake	m_M	[kg]	2.6				
Motor mass with brake	m_{MB}	[kg]	2.8				



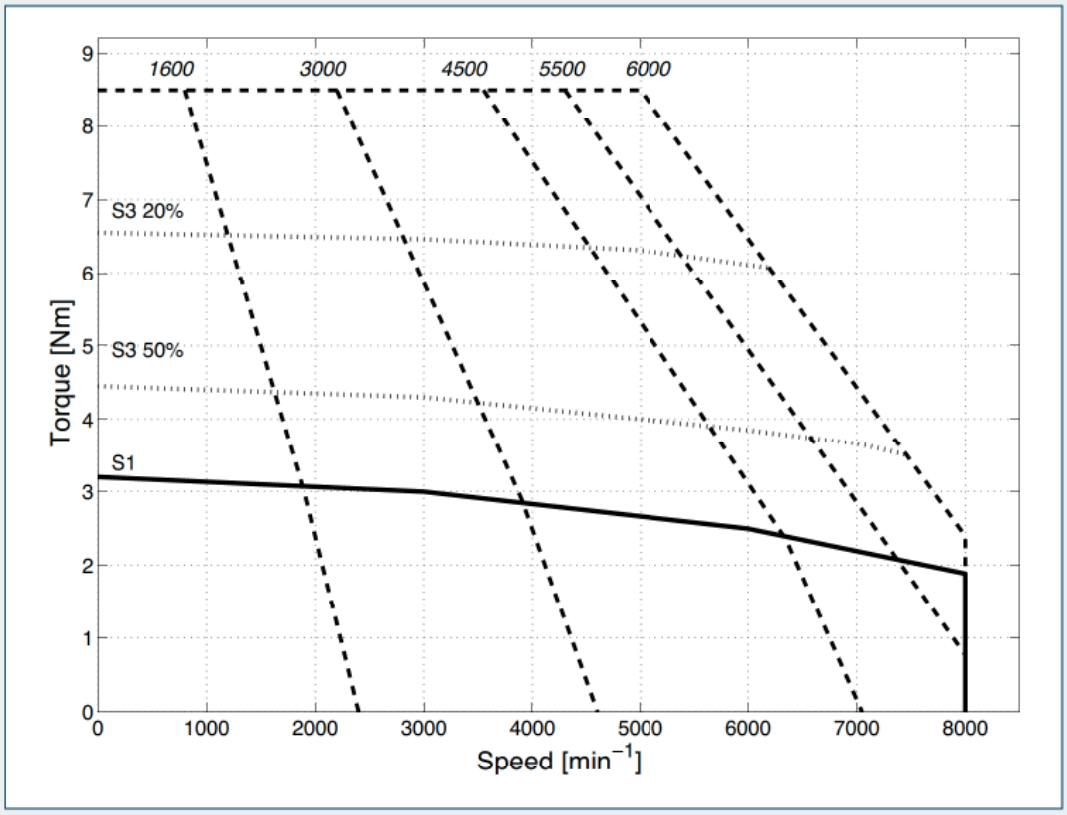
MMD 82 • 3.2 Nm - 230V

Parameter	Symbol	Unit	Speed [min^{-1}]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]	3.2				
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	191	207	200	176	176
Rated Torque (dT=105K)	M_n	[Nm]	3.15	3	2.8	2.6	2.5
Current at rated speed	I_n	[A]	2.37	3.8	5.3	7.0	7.6
Standstill current	I_0	[A]	2.41	3.9	6.0	8.3	9.0
Max Torque	M_{max}	[Nm]	8.5	8.5	8.5	8.5	8.5
Max Current	I_{max}	[A]	8.3	13.4	20.6	28.4	31
Back EMF constant	K_e	[V/1000min^{-1}]	92	57	37	27	24
Torque constant	K_T	[Nm/A]	1.33	0.82	0.53	0.39	0.35
Rated Power	P_n	[kW]	0.53	0.94	1.32	1.50	1.57
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	11.3	4.33	1.81	0.96	0.81
Stator phase-phase Inductance	L_{pp}	[mH]	64.2	24.5	10.3	5.4	4.6
Rotor inertia	J_m	[kgm² x 10^{-4}]	1.4				
Electric time constant (at 20°C)	τ_{el}	[ms]	5.7				
Thermal time constant	τ_{therm}	[min]	26				
Motor mass without brake	m_M	[kg]	3.5				
Motor mass with brake	m_{MB}	[kg]	4.1				



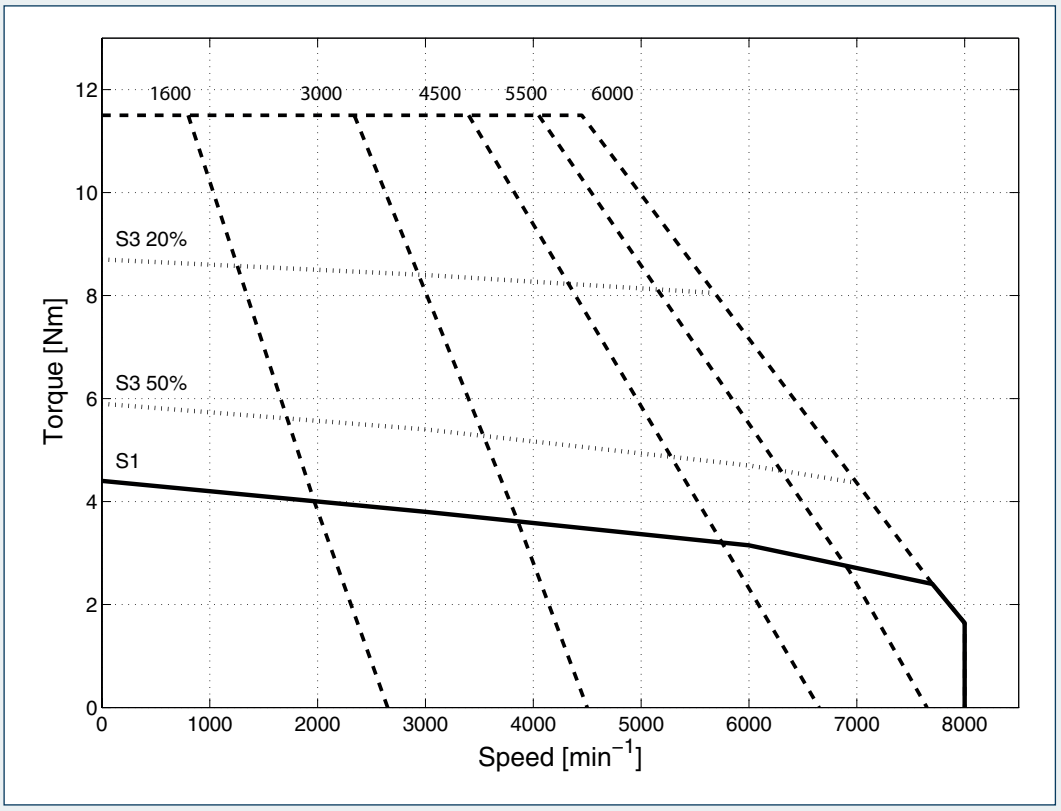
MMD 82 • 3.2 Nm - 400V

Parameter	Symbol	Unit	Speed [min^{-1}]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]	3.2				
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	332	358	312	323	308
Rated Torque (dT=105K)	M_n	[Nm]	3.15	3	2.8	2.6	2.5
Current at rated speed	I_n	[A]	1.36	2.16	3.4	3.8	4.3
Standstill current	I_0	[A]	1.39	2.25	3.9	4.5	5.2
Max Torque	M_{max}	[Nm]	8.5	8.5	8.5	8.5	8.5
Max Current	I_{max}	[A]	4.7	7.69	13.2	15.5	17.7
Back EMF constant	K_e	[V/1000min^{-1}]	159	98	57	49	43
Torque constant	K_T	[Nm/A]	2.31	1.42	0.83	0.71	0.62
Rated Power	P_n	[kW]	0.53	0.94	1.32	1.50	1.57
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	34.3	13.05	4.42	3.23	2.47
Stator phase-phase Inductance	L_{pp}	[mH]	194	73.9	25.0	18.3	14.0
Rotor inertia	J_m	[kgm^2 x 10^{-4}]	1.4				
Electric time constant (at 20°C)	τ_{el}	[ms]	5.7				
Thermal time constant	τ_{therm}	[min]	26				
Motor mass without brake	m_M	[kg]	3.5				
Motor mass with brake	m_{MB}	[kg]	4.1				



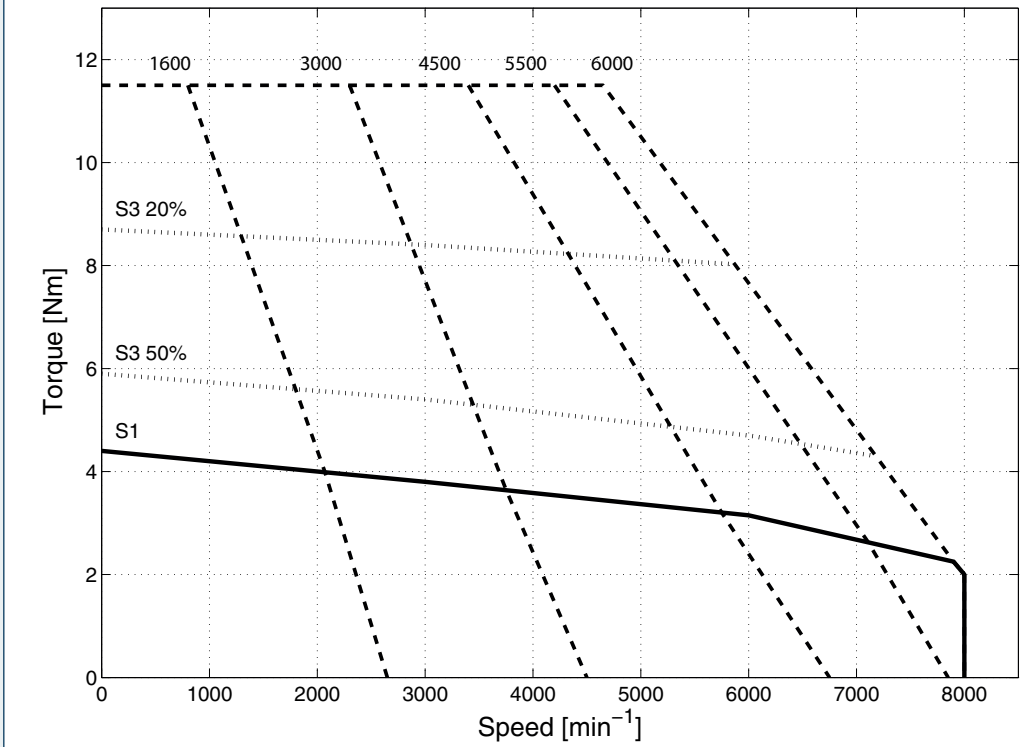
MMD 82 • 4.4 Nm - 230V

Parameter	Symbol	Unit	Speed [min $^{-1}$]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]	4.4				
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	181	208	188	196	197
Rated Torque (dT=105K)	M_n	[Nm]	4.2	3.8	3.55	3.3	3.15
Current at rated speed	I_n	[A]	3.1	4.6	6.8	7.3	7.6
Standstill current	I_0	[A]	3.3	5.3	8.4	9.7	10.6
Max Torque	M_{max}	[Nm]	11.5	11.5	11.5	11.5	11.5
Max Current	I_{max}	[A]	9.8	15.9	25.1	29.2	32
Back EMF constant	K_e	[V/1000min $^{-1}$]	93	57	36	31	29
Torque constant	K_T	[Nm/A]	1.35	0.83	0.53	0.45	0.42
Rated Power	P_n	[kW]	0.70	1.19	1.67	1.90	2.0
Stator phase-phase Resistance (at 20°C)	R_{pp}	[W]	6.89	2.63	1.05	0.78	0.66
Stator phase-phase Inductance	L_{pp}	[mH]	39.0	14.9	6.0	4.4	3.7
Rotor inertia	J_m	[kgm ^{2} x 10 $^{-4}$]	1.7				
Electric time constant (at 20°C)	t_{el}	[ms]	5.7				
Thermal time constant	t_{therm}	[min]	33				
Motor mass without brake	m_M	[kg]	4.6				
Motor mass with brake	m_{MB}	[kg]	5.2				



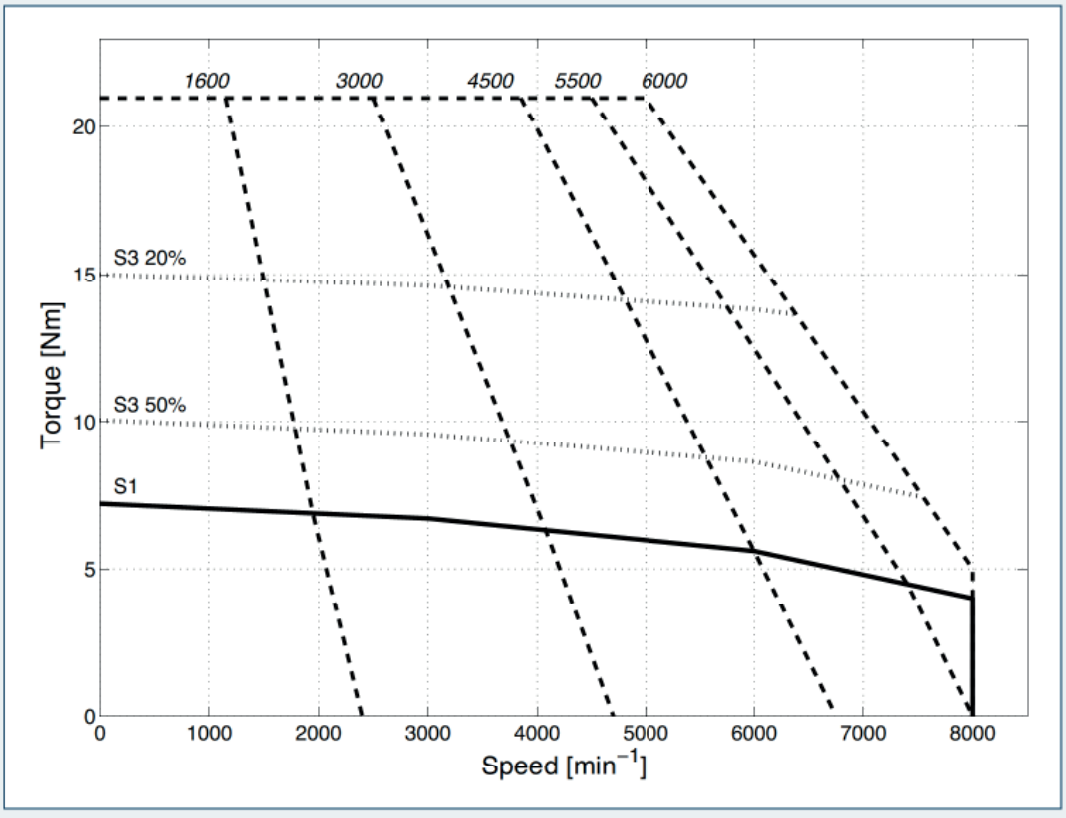
MMD 82 • 4.4 Nm - 400V

Parameter	Symbol	Unit	Speed [min $^{-1}$]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]			4.4		
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	315	356	328	335	335
Rated Torque (dT=105K)	M_n	[Nm]	4.2	3.8	3.55	3.3	3.15
Current at rated speed	I_n	[A]	1.76	2.7	3.9	4.3	4.5
Standstill current	I_0	[A]	1.88	3.1	4.8	5.7	6.2
Max Torque	M_{max}	[Nm]	11.5	11.5	11.5	11.5	11.5
Max Current	I_{max}	[A]	5.6	9.2	14.4	17.1	18.6
Back EMF constant	K_e	[V/1000min $^{-1}$]	161	99	63	53	49
Torque constant	K_T	[Nm/A]	2.34	1.43	0.92	0.77	0.71
Rated Power	P_n	[kW]	0.70	1.19	1.67	1.90	2.0
Stator phase-phase Resistance (at 20°C)	R_{pp}	[W]	20.8	6.80	3.21	2.26	1.92
Stator phase-phase Inductance	L_{pp}	[mH]	118	44.1	18.1	12.8	10.8
Rotor inertia	J_m	[kgm ^{2} x 10 $^{-4}$]			1.7		
Electric time constant (at 20°C)	t_{el}	[ms]			5.7		
Thermal time constant	t_{therm}	[min]			33		
Motor mass without brake	m_M	[kg]			4.6		
Motor mass with brake	m_{MB}	[kg]			5.2		



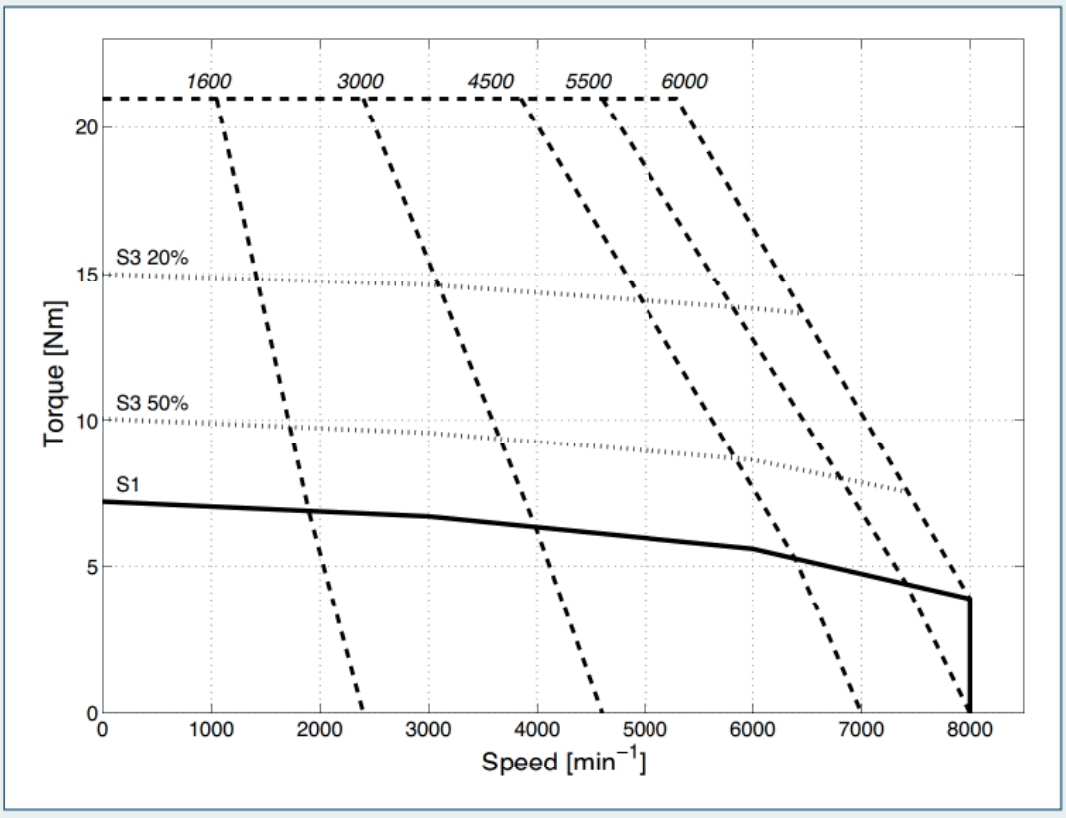
MMD 102 • 7.2 Nm - 230V

Parameter	Symbol	Unit	Speed [min^{-1}]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]	7.2				
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	187	208	182	183	185
Rated Torque (dT=105K)	M_n	[Nm]	7	6.7	6	5.8	5.6
Current at rated speed	I_n	[A]	5.0	8.0	12.6	14.4	15.4
Standstill current	I_0	[A]	5.0	8.2	13.9	16.9	18.2
Max Torque	M_{max}	[Nm]	21	21	21	21	21
Max Current	I_{max}	[A]	18.3	29.7	51	61	66
Back EMF constant	K_e	[V/1000min^{-1}]	94	58	34	28	26
Torque constant	K_T	[Nm/A]	1.43	0.88	0.52	0.43	0.40
Rated Power	P_n	[kW]	1.17	2.10	2.83	3.3	3.5
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	3.02	1.15	0.40	0.27	0.23
Stator phase-phase Inductance	L_{pp}	[mH]	25.4	9.7	3.3	2.3	1.9
Rotor inertia	J_m	[kgm² x 10^{-4}]	3.4				
Electric time constant (at 20°C)	τ_{el}	[ms]	8.4				
Thermal time constant	τ_{therm}	[min]	31				
Motor mass without brake	m_M	[kg]	5.8				
Motor mass with brake	m_{MB}	[kg]	7				



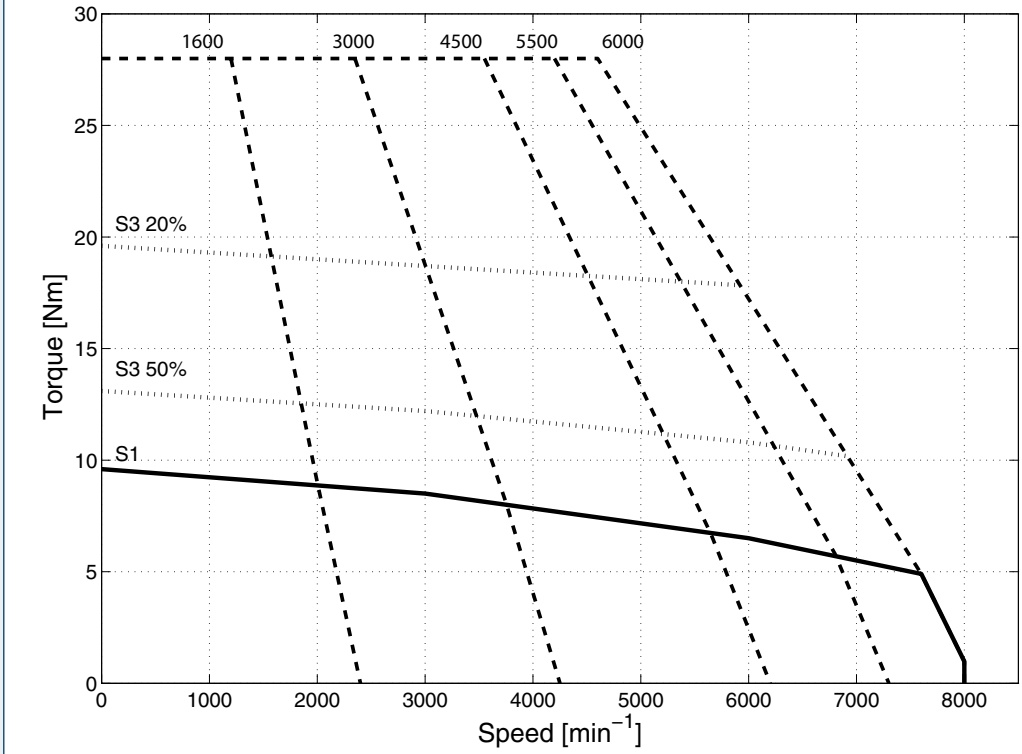
MMD 102 • 7.2 Nm - 400V

Parameter	Symbol	Unit	Speed [min⁻¹]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]			7.2		
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	320	355	305	320	305
Rated Torque (dT=105K)	M_n	[Nm]	7	6.7	6	5.8	5.6
Current at rated speed	I_n	[A]	2.92	4.7	7.5	8.2	9.3
Standstill current	I_0	[A]	2.94	4.8	8.3	9.7	11.0
Max Torque	M_{max}	[Nm]	21	21	21	21	21
Max Current	I_{max}	[A]	10.7	17.4	30	35	40
Back EMF constant	K_e	[V/1000min⁻¹]	161	99	57	49	43
Torque constant	K_T	[Nm/A]	2.45	1.51	0.87	0.75	0.65
Rated Power	P_n	[kW]	1.17	2.10	2.83	3.3	3.5
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	8.87	3.35	1.11	0.82	0.63
Stator phase-phase Inductance	L_{pp}	[mH]	74.7	28.2	9.4	6.9	5.3
Rotor inertia	J_m	[kgm² x 10⁻⁴]			3.7		
Electric time constant (at 20°C)	τ_{el}	[ms]			8.4		
Thermal time constant	τ_{therm}	[min]			31		
Motor mass without brake	m_M	[kg]			5.8		
Motor mass with brake	m_{MB}	[kg]			7		



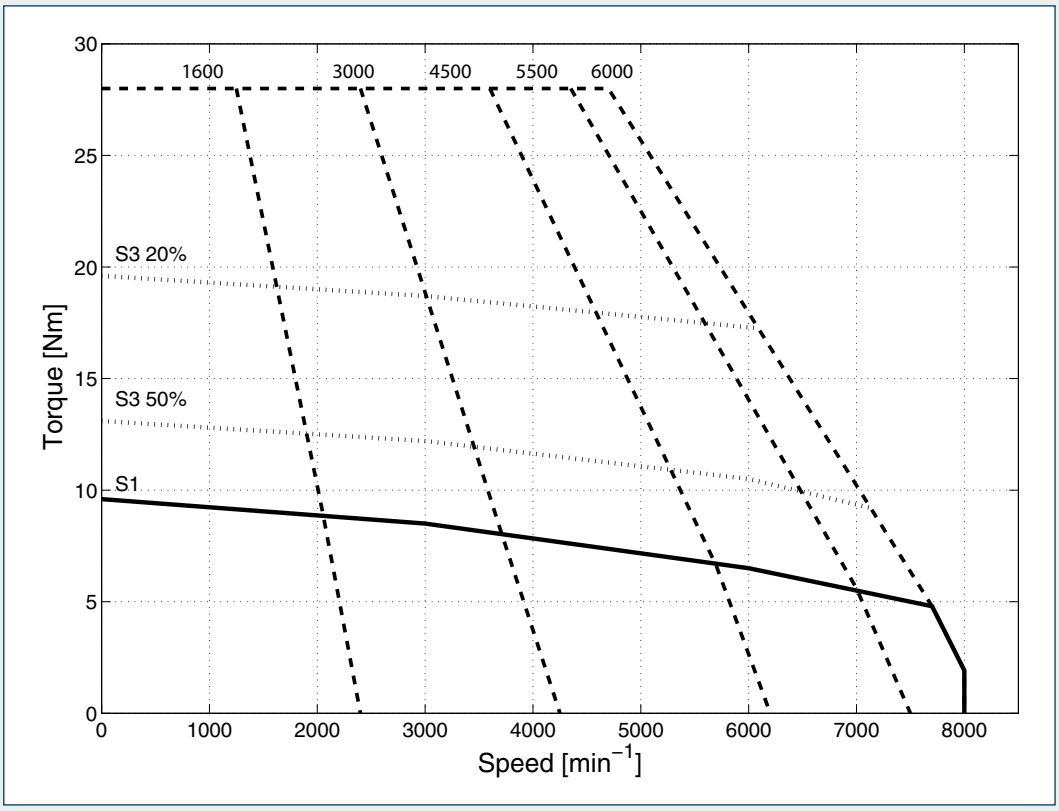
MMD 102 • 9.6 Nm - 230V

Parameter	Symbol	Unit	Speed [min $^{-1}$]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]	9.6				
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	183	184	187	192	190
Rated Torque (dT=105K)	M_n	[Nm]	9.2	8.5	7.7	6.9	6.5
Current at rated speed	I_n	[A]	6.0	10.2	13.5	14.3	14.8
Standstill current	I_0	[A]	6.3	11.5	16.8	19.8	21.8
Max Torque	M_{max}	[Nm]	28	28	28	28	28
Max Current	I_{max}	[A]	20.4	37	54	64	70
Back EMF constant	K_e	[V/1000min $^{-1}$]	102	56	38	33	30
Torque constant	K_T	[Nm/A]	1.52	0.84	0.57	0.48	0.44
Rated Power	P_n	[kW]	1.54	2.7	3.6	4.0	4.1
Stator phase-phase Resistance (at 20°C)	R_{pp}	[W]	2.24	0.68	0.32	0.23	0.19
Stator phase-phase Inductance	L_{pp}	[mH]	18.8	5.7	2.7	1.9	1.6
Rotor inertia	J_m	[kgm ^{2} x 10 $^{-4}$]	4.7				
Electric time constant (at 20°C)	t_{el}	[ms]	8.4				
Thermal time constant	t_{therm}	[min]	38				
Motor mass without brake	m_M	[kg]	7.4				
Motor mass with brake	m_{MB}	[kg]	8.6				



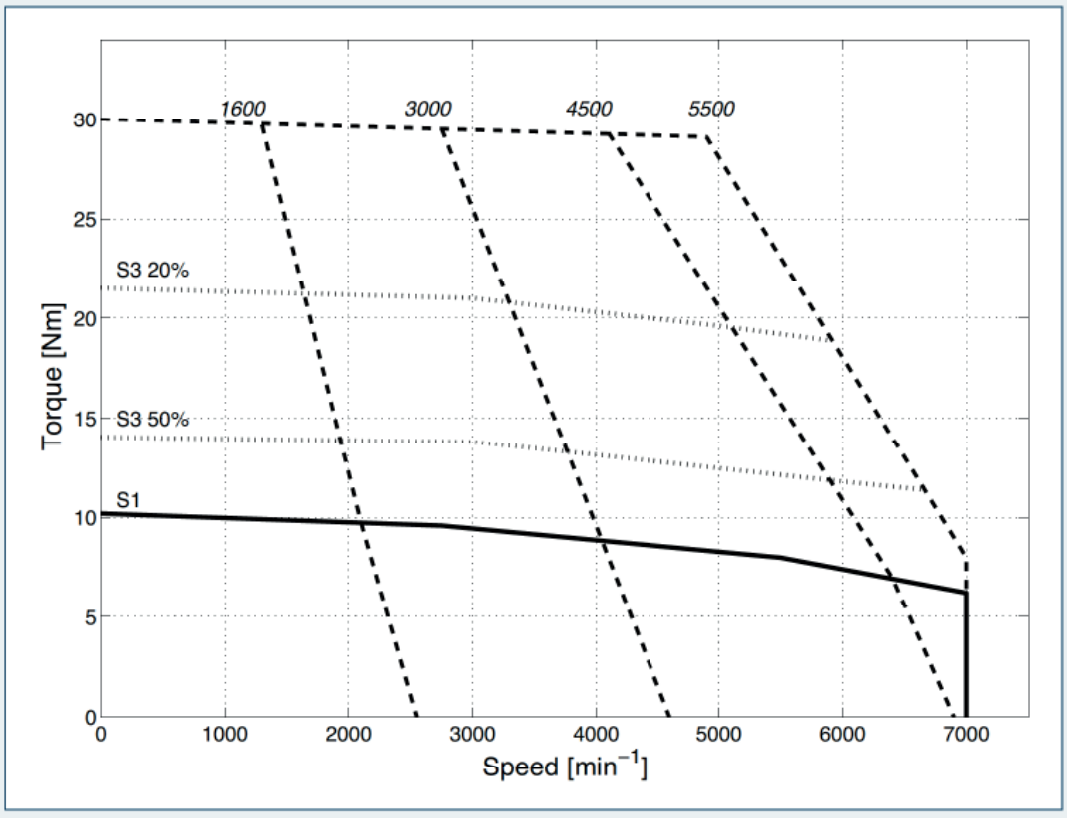
MMD 102 • 9.6 Nm - 400V

Parameter	Symbol	Unit	Speed [min $^{-1}$]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]			9.6		
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	318	324	323	332	333
Rated Torque (dT=105K)	M_n	[Nm]	9.2	8.5	7.7	6.9	6.5
Current at rated speed	I_n	[A]	3.4	5.8	7.8	8.3	8.4
Standstill current	I_0	[A]	3.6	6.5	9.7	11.5	12.4
Max Torque	M_{max}	[Nm]	28	28	28	28	28
Max Current	I_{max}	[A]	11.7	21.0	31	37	40
Back EMF constant	K_e	[V/1000min $^{-1}$]	177	99	66	56	52
Torque constant	K_T	[Nm/A]	2.65	1.48	0.99	0.84	0.77
Rated Power	P_n	[kW]	1.54	2.7	3.6	4.0	4.1
Stator phase-phase Resistance (at 20°C)	R_{pp}	[W]	6.77	2.11	0.95	0.68	0.58
Stator phase-phase Inductance	L_{pp}	[mH]	56.8	17.7	8.0	5.7	4.8
Rotor inertia	J_m	[kgm ^{2} x 10 $^{-4}$]			4.7		
Electric time constant (at 20°C)	t_{el}	[ms]			8.4		
Thermal time constant	t_{therm}	[min]			38		
Motor mass without brake	m_M	[kg]			7.4		
Motor mass with brake	m_{MB}	[kg]			8.6		



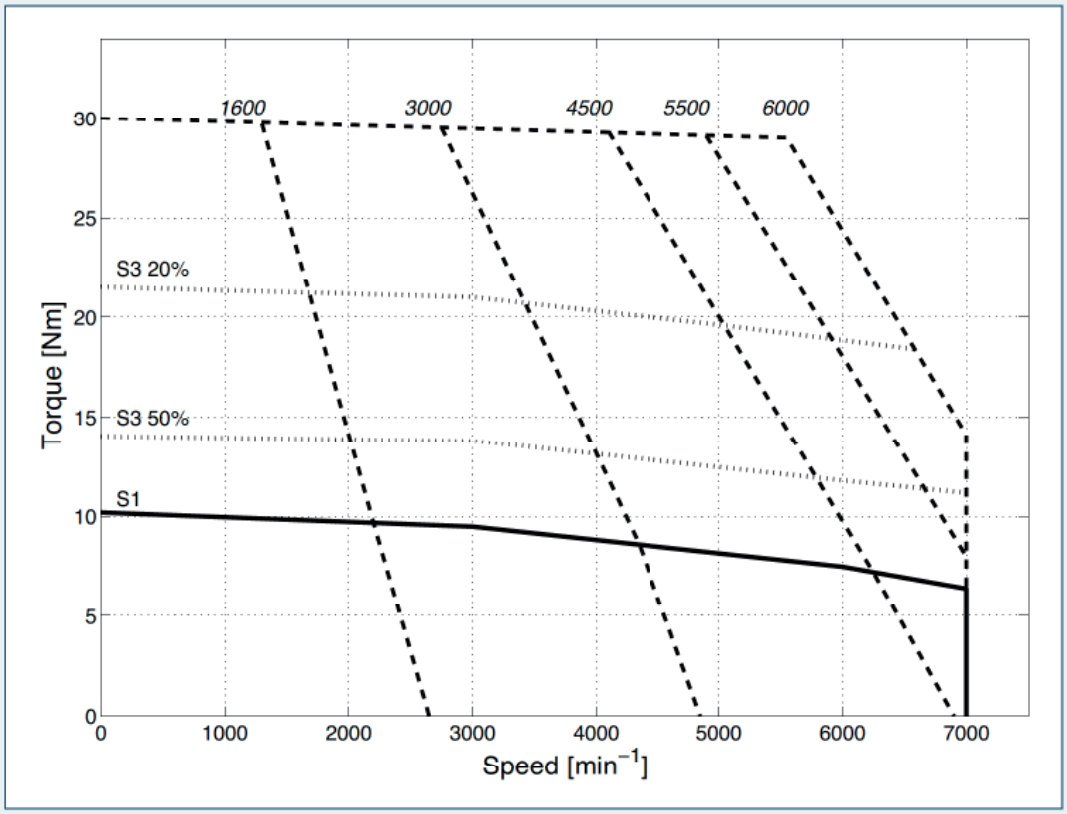
MMD 118 • 10.2 Nm - 230V

Parameter	Symbol	Unit	Speed [min^{-1}]			
			1600	3000	4500	5500
Standstill torque (dT=105K)	M_0	[Nm]	10.2			
Motor rated frequency	f_n	[Hz]	107	200	300	367
Motor rated voltage	V_n	[V_{AC}]	184	178	174	196
Rated Torque (dT=105K)	M_n	[Nm]	10	9.5	8.5	8
Current at rated speed	I_n	[A]	7.2	13.5	18.3	17.4
Standstill current	I_0	[A]	7.2	13.7	20.8	22.6
Max Torque	M_{max}	[Nm]	30	30	30	30
Max Current	I_{max}	[A]	25.3	48	73	79
Back EMF constant	K_e	[V/1000min^{-1}]	95	50	33.1	30.4
Torque constant	K_T	[Nm/A]	1.41	0.75	0.49	0.45
Rated Power	P_n	[kW]	1.7	3.0	4.0	4.6
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	1.56	0.43	0.19	0.16
Stator phase-phase Inductance	L_{pp}	[mH]	20.5	5.7	2.5	2.1
Rotor inertia	J_m	[kgm² x 10^{-4}]	7.8			
Electric time constant (at 20°C)	τ_{el}	[ms]	13			
Thermal time constant	τ_{therm}	[min]	34			
Motor mass without brake	m_M	[kg]	9.7			
Motor mass with brake	m_{MB}	[kg]	11.9			



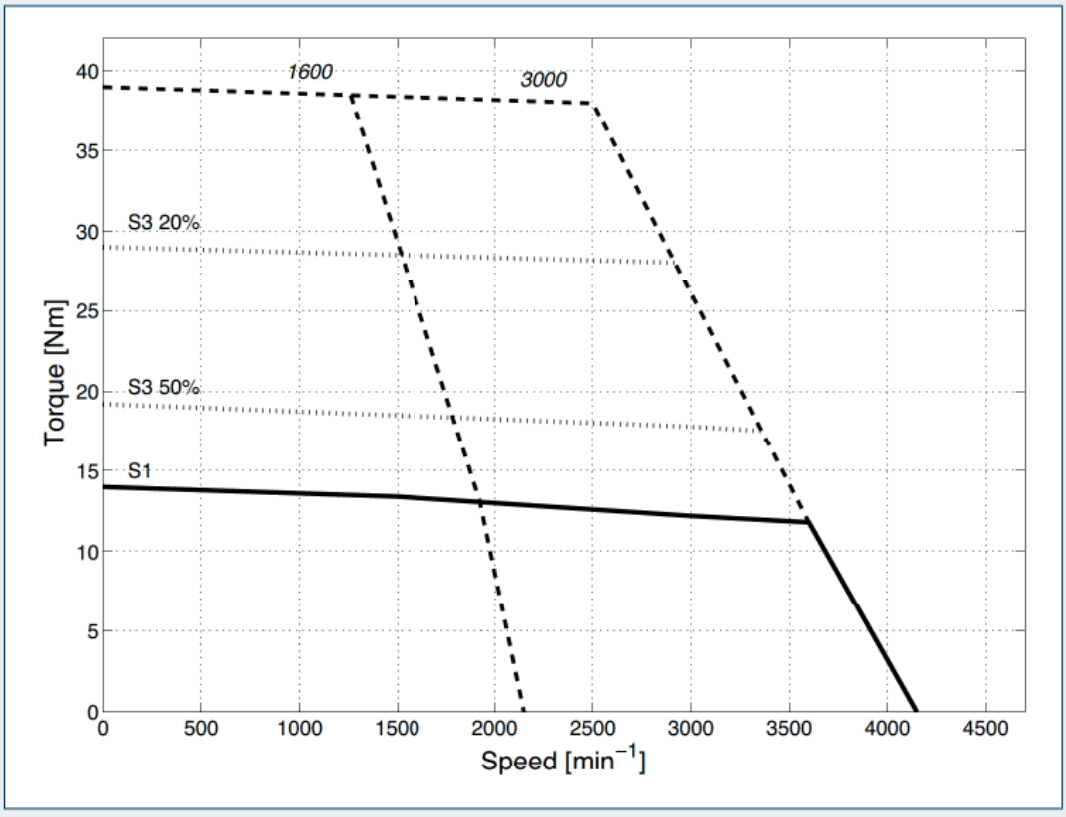
MMD 118 • 10.2 Nm - 400V

Parameter	Symbol	Unit	Speed [min^{-1}]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]	10.2				
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	312	342	314	323	306
Rated Torque (dT=105K)	M_n	[Nm]	10	9.5	8.5	8	7.5
Current at rated speed	I_n	[A]	4.2	6.7	10.2	10.5	11.4
Standstill current	I_0	[A]	4.3	6.8	11.6	13.7	15.8
Max Torque	M_{max}	[Nm]	30	30	30	30	30
Max Current	I_{max}	[A]	14.9	23.6	40	48	55
Back EMF constant	K_e	[V/1000min^{-1}]	161	102	60	50	44
Torque constant	K_T	[Nm/A]	2.39	1.51	0.88	0.75	0.65
Rated Power	P_n	[kW]	1.68	3.0	4.0	4.6	4.7
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	4.47	1.78	0.61	0.43	0.33
Stator phase-phase Inductance	L_{pp}	[mH]	58.8	23.4	8.0	5.7	4.3
Rotor inertia	J_m	[kgm^2 x 10^{-4}]	7.8				
Electric time constant (at 20°C)	τ_{el}	[ms]	13				
Thermal time constant	τ_{therm}	[min]	34				
Motor mass without brake	m_M	[kg]	9.7				
Motor mass with brake	m_{MB}	[kg]	11.9				



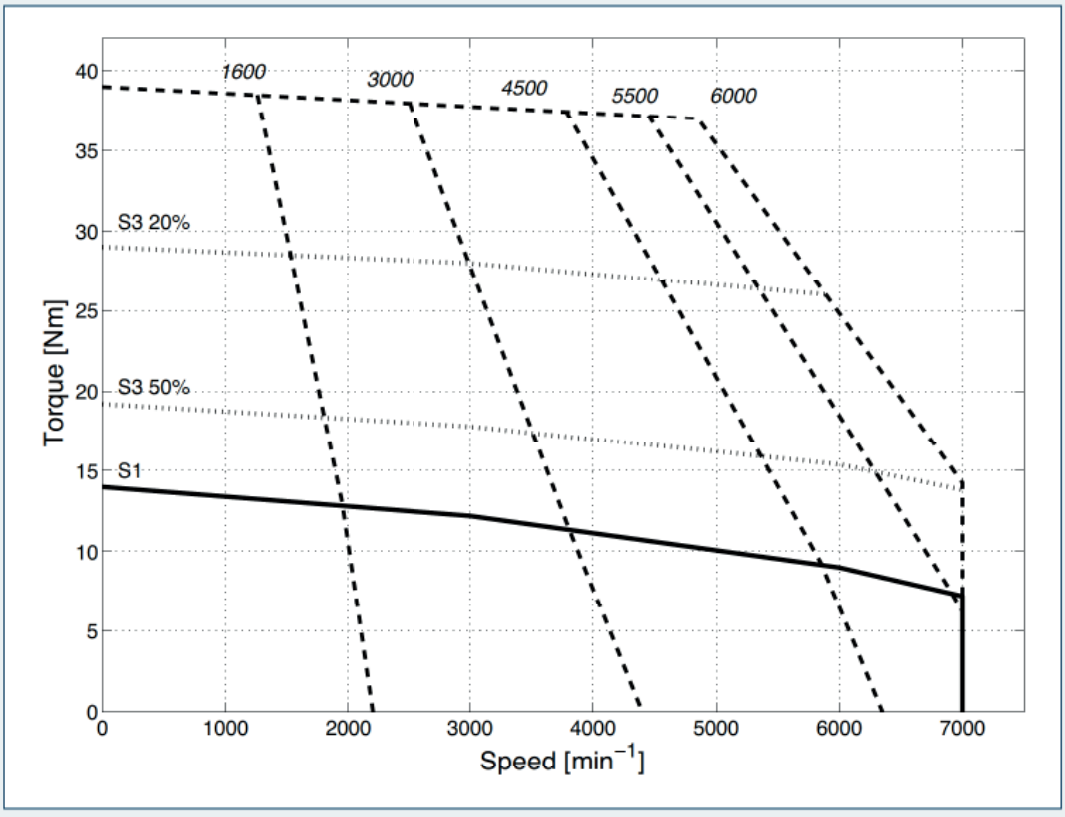
MMD 118 • 14 Nm - 230V

Parameter	Symbol	Unit	Speed [min^{-1}]	
			1600	3000
Standstill torque (dT=105K)	M_0	[Nm]	14.0	
Motor rated frequency	f_n	[Hz]	107	200
Motor rated voltage	V_n	[V_{AC}]	184	192
Rated Torque (dT=105K)	M_n	[Nm]	13.3	12.2
Current at rated speed	I_n	[A]	8.6	14.0
Standstill current	I_0	[A]	9.2	16.3
Max Torque	M_{max}	[Nm]	39	39
Max Current	I_{max}	[A]	30	53
Back EMF constant	K_e	[V/1000min^{-1}]	104	59
Torque constant	K_T	[Nm/A]	1.51	0.86
Rated Power	P_n	[kW]	2.2	3.8
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	1.17	0.37
Stator phase-phase Inductance	L_{pp}	[mH]	15.4	4.9
Rotor inertia	J_m	[kgm^2 x 10^{-4}]	9.9	
Electric time constant (at 20°C)	τ_{el}	[ms]	13	
Thermal time constant	τ_{therm}	[min]	42	
Motor mass without brake	m_M	[kg]	11.7	
Motor mass with brake	m_{MB}	[kg]	12.9	



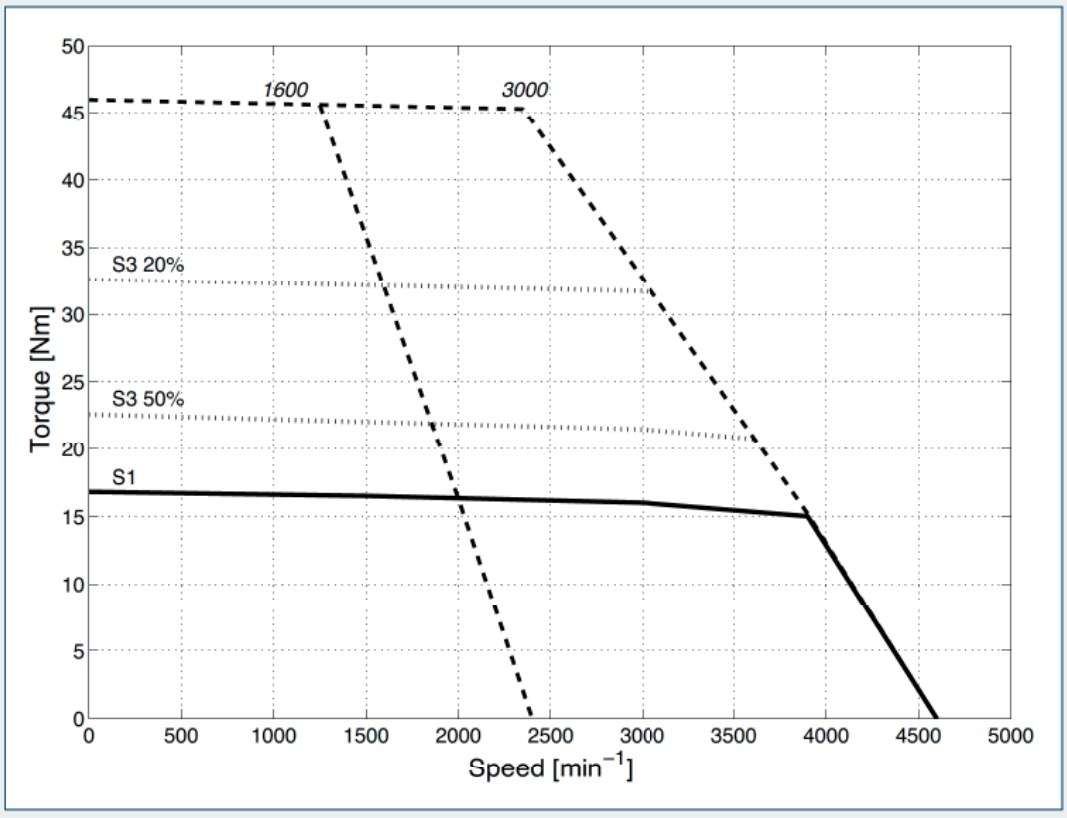
MMD 118 • 14 Nm - 400V

Parameter	Symbol	Unit	Speed [min^{-1}]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]			14.0		
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	323	320	325	335	329
Rated Torque (dT=105K)	M_n	[Nm]	13.3	12.2	10.9	9.7	9.0
Current at rated speed	I_n	[A]	4.9	8.4	10.9	11.4	11.8
Standstill current	I_0	[A]	5.3	9.8	14.4	16.9	18.9
Max Torque	M_{max}	[Nm]	39	39	39	39	39
Max Current	I_{max}	[A]	17.2	32	47	55	62
Back EMF constant	K_e	[V/1000min^{-1}]	182	98	67	57	51
Torque constant	K_T	[Nm/A]	2.66	1.43	0.97	0.83	0.74
Rated Power	P_n	[kW]	2.2	3.8	5.0	5.3	5.3
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	3.60	1.04	0.48	0.35	0.28
Stator phase-phase Inductance	L_{pp}	[mH]	47.4	13.7	6.3	4.6	3.7
Rotor inertia	J_m	[kgm² x 10^{-4}]			9.9		
Electric time constant (at 20°C)	τ_{el}	[ms]			13		
Thermal time constant	τ_{therm}	[min]			42		
Motor mass without brake	m_M	[kg]			11.7		
Motor mass with brake	m_{MB}	[kg]			12.9		



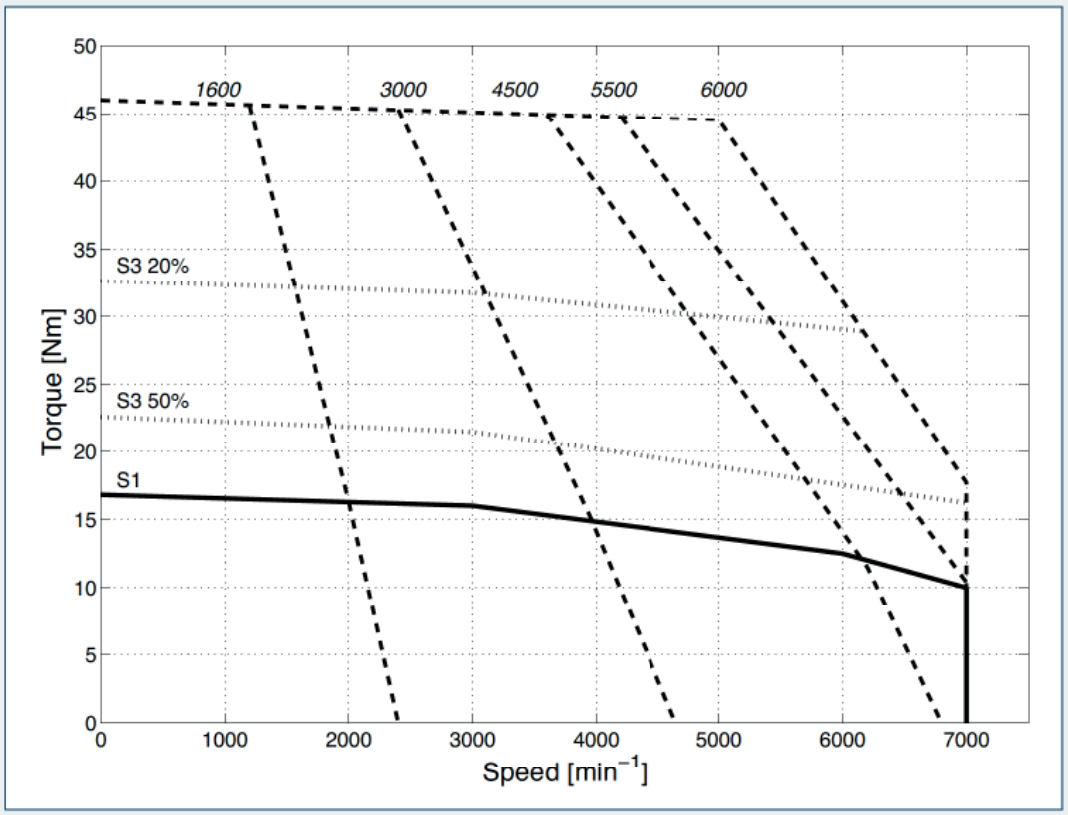
MMD 145 • 16.8 Nm - 230V

Parameter	Symbol	Unit	Speed [min^{-1}]	
			1600	3000
Standstill torque (dT=105K)	M_0	[Nm]	16.8	
Motor rated frequency	f_n	[Hz]	107	200
Motor rated voltage	V_n	[V_{AC}]	180	176
Rated Torque (dT=105K)	M_n	[Nm]	16.5	16
Current at rated speed	I_n	[A]	11.9	21.9
Standstill current	I_0	[A]	12.1	22.8
Max Torque	M_{max}	[Nm]	46	46
Max Current	I_{max}	[A]	46	88
Back EMF constant	K_e	[V/1000min^{-1}]	89	47
Torque constant	K_T	[Nm/A]	1.39	0.74
Rated Power	P_n	[kW]	2.76	5.0
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	0.84	0.24
Stator phase-phase Inductance	L_{pp}	[mH]	13.3	3.8
Rotor inertia	J_m	[kgm² x 10^{-4}]	12.8	
Electric time constant (at 20°C)	τ_{el}	[ms]	16	
Thermal time constant	τ_{therm}	[min]	36	
Motor mass without brake	m_M	[kg]	15.2	
Motor mass with brake	m_{MB}	[kg]	17.8	



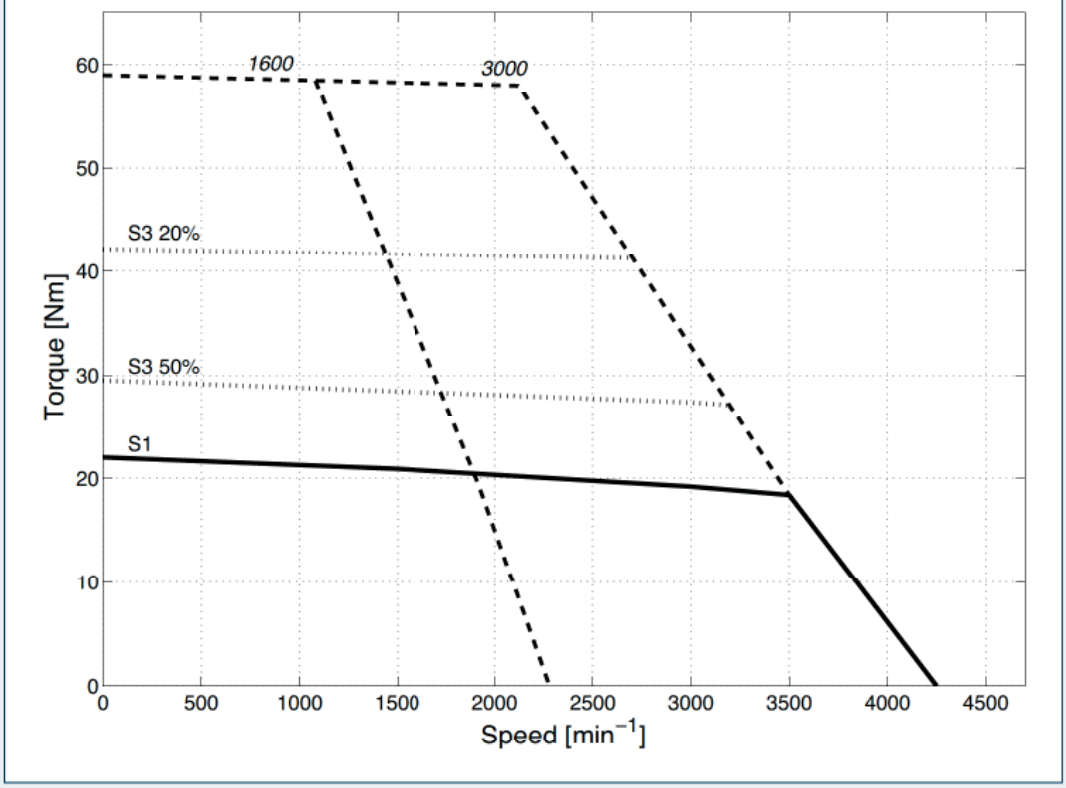
MMD 145 • 16.8 Nm - 400V

Parameter	Symbol	Unit	Speed [min⁻¹]				
			1600	3000	4500	5500	6000
Standstill torque (dT=105K)	M_0	[Nm]	16.8				
Motor rated frequency	f_n	[Hz]	107	200	300	367	400
Motor rated voltage	V_n	[V_{AC}]	314	358	314	319	305
Rated Torque (dT=105K)	M_n	[Nm]	16.5	16	14	13	12.5
Current at rated speed	I_n	[A]	6.8	10.5	16.4	17.5	19
Standstill current	I_0	[A]	6.9	10.9	19.0	22.8	26
Max Torque	M_{max}	[Nm]	46	46	46	46	46
Max Current	I_{max}	[A]	26.7	42.0	73	88	100
Back EMF constant	K_e	[V/1000min⁻¹]	156	99	57	47	42
Torque constant	K_T	[Nm/A]	2.42	1.54	0.88	0.74	0.65
Rated Power	P_n	[kW]	2.76	5.0	6.6	7.5	7.9
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	2.53	1.02	0.34	0.24	0.18
Stator phase-phase Inductance	L_{pp}	[mH]	40.4	16.3	5.4	3.8	2.9
Rotor inertia	J_m	[kgm² x 10⁻⁴]	12.8				
Electric time constant (at 20°C)	τ_{el}	[ms]	16				
Thermal time constant	τ_{therm}	[min]	36				
Motor mass without brake	m_M	[kg]	15.2				
Motor mass with brake	m_{MB}	[kg]	17.8				



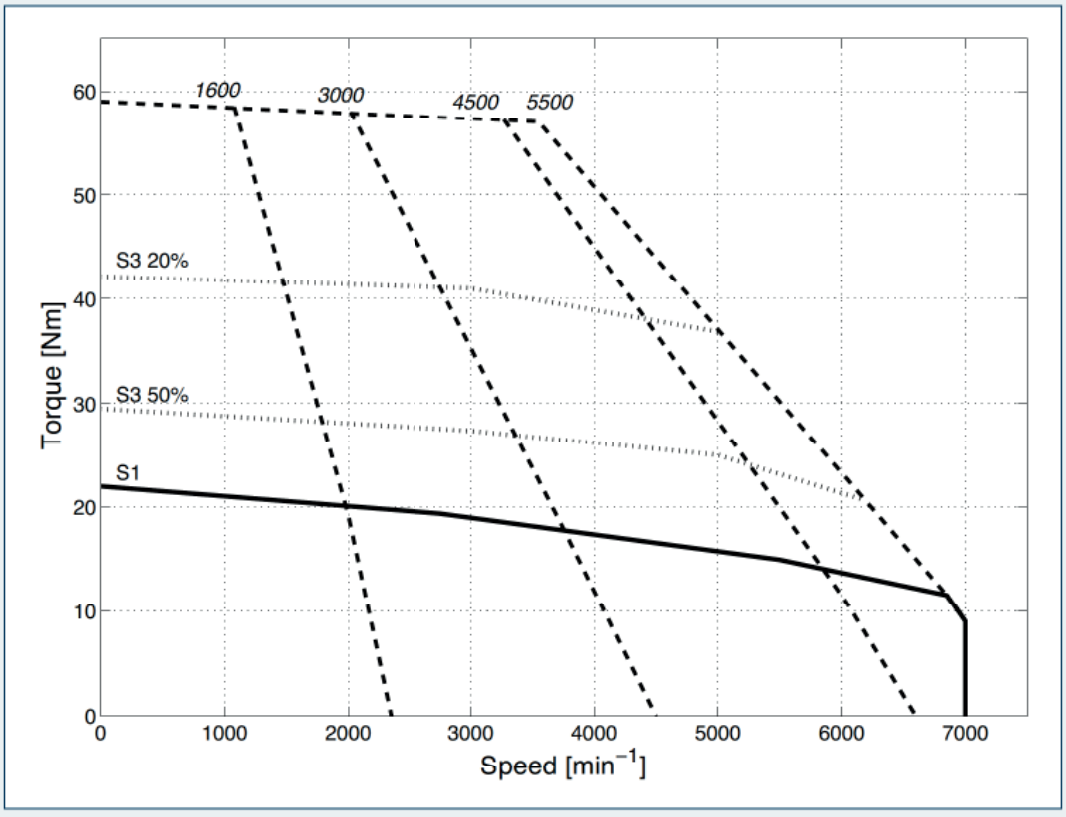
MMD 145 • 22 Nm - 230V

Parameter	Symbol	Unit	Speed [min^{-1}]	
			1600	3000
Standstill torque (dT=105K)	M_0	[Nm]	22.0	
Motor rated frequency	f_n	[Hz]	107	200
Motor rated voltage	V_n	[V_{AC}]	185	202
Rated Torque (dT=105K)	M_n	[Nm]	20.7	19.2
Current at rated speed	I_n	[A]	14.5	22.9
Standstill current	I_0	[A]	15.4	26.5
Max Torque	M_{max}	[Nm]	59	59
Max Current	I_{max}	[A]	51	87
Back EMF constant	K_e	[V/1000min^{-1}]	102	60
Torque constant	K_T	[Nm/A]	1.42	0.83
Rated Power	P_n	[kW]	3.5	6.0
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	0.67	0.23
Stator phase-phase Inductance	L_{pp}	[mH]	10.6	3.6
Rotor inertia	J_m	[kgm^2 x 10^{-4}]	17.6	
Electric time constant (at 20°C)	τ_{el}	[ms]	16	
Thermal time constant	τ_{therm}	[min]	47	
Motor mass without brake	m_M	[kg]	18.2	
Motor mass with brake	m_{MB}	[kg]	20.8	



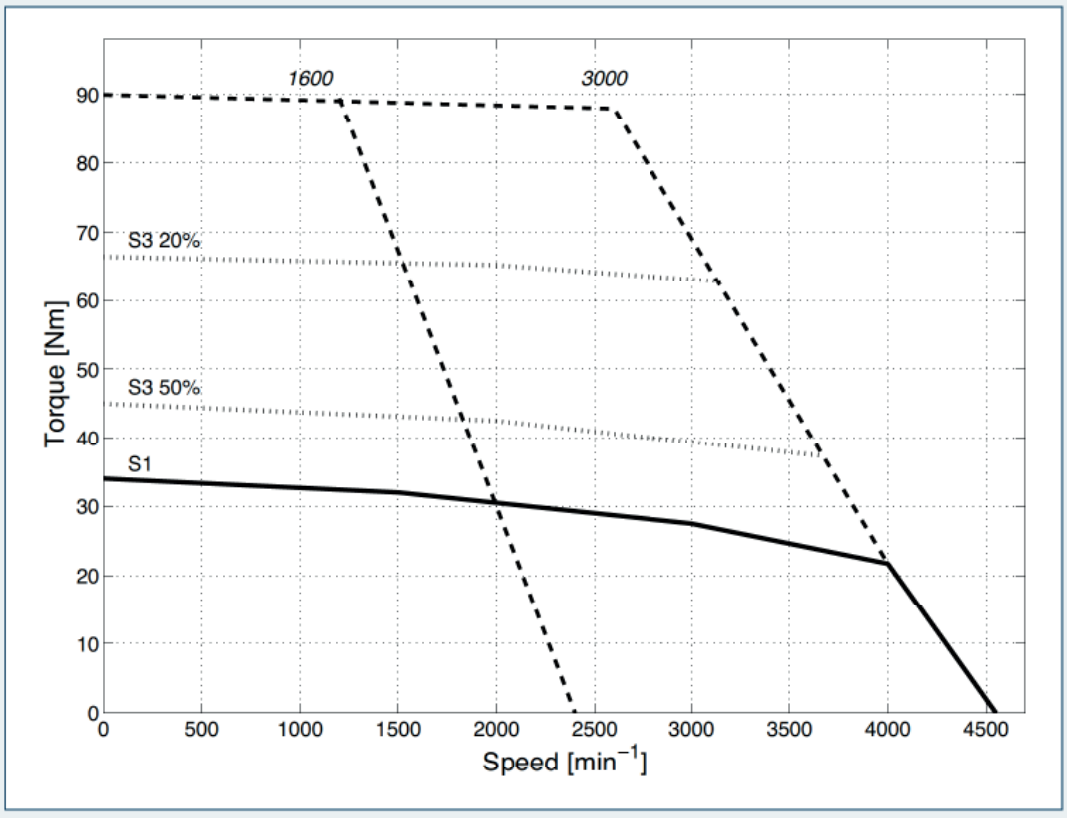
MMD 145 • 22 Nm - 400V

Parameter	Symbol	Unit	Speed [min^{-1}]			
			1600	3000	4500	5500
Standstill torque (dT=105K)	M_0	[Nm]	22.0			
Motor rated frequency	f_n	[Hz]	107	200	300	367
Motor rated voltage	V_n	[V_{AC}]	319	321	323	357
Rated Torque (dT=105K)	M_n	[Nm]	20.7	19.2	17	15
Current at rated speed	I_n	[A]	8.4	14.2	18.3	17.6
Standstill current	I_0	[A]	9.0	16.4	24.3	26.5
Max Torque	M_{max}	[Nm]	59	59	59	59
Max Current	I_{max}	[A]	29.5	54	80	87
Back EMF constant	K_e	[V/1000min^{-1}]	176	96	65	59
Torque constant	K_T	[Nm/A]	2.45	1.34	0.90	0.83
Rated Power	P_n	[kW]	3.5	6.0	8.0	8.6
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	1.97	0.59	0.27	0.23
Stator phase-phase Inductance	L_{pp}	[mH]	31.5	9.4	4.3	3.6
Rotor inertia	J_m	[kgm^2 x 10^{-4}]	17.6			
Electric time constant (at 20°C)	τ_{el}	[ms]	16			
Thermal time constant	τ_{therm}	[min]	47			
Motor mass without brake	m_M	[kg]	18.2			
Motor mass with brake	m_{MB}	[kg]	20.8			



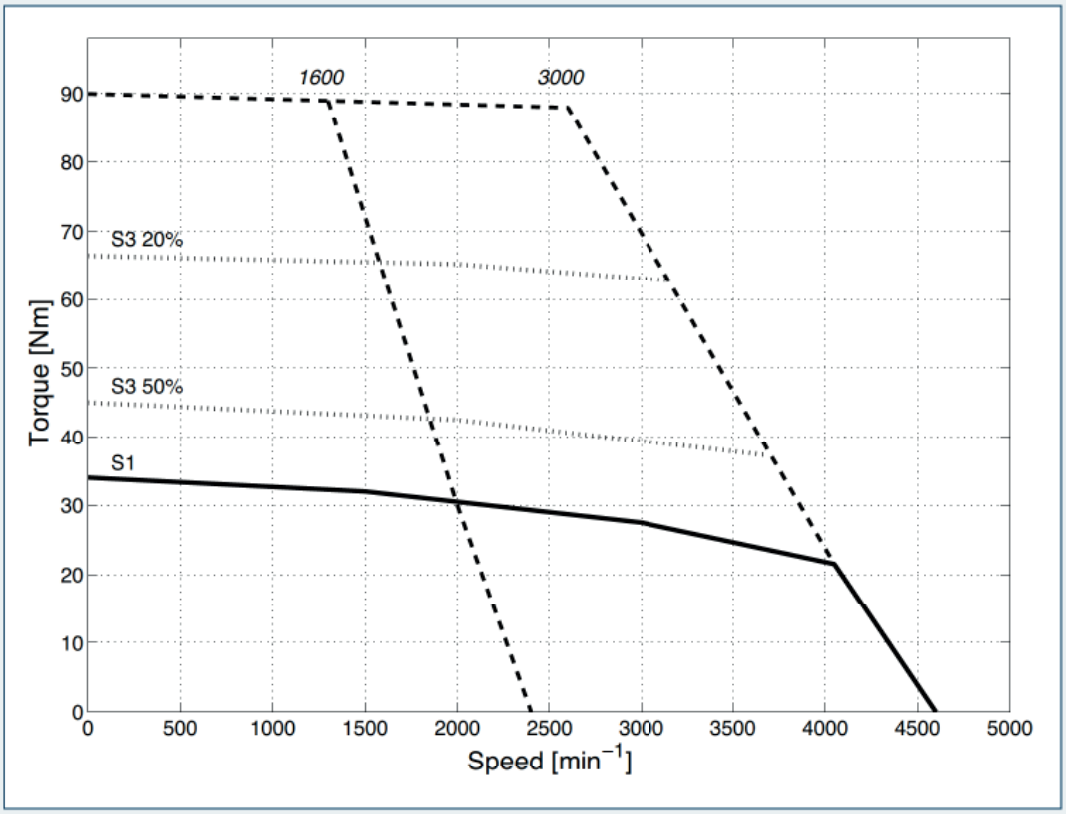
MMD 170 • 34 Nm - 230V

Parameter	Symbol	Unit	Speed [min^{-1}]	
			1600	3000
Standstill torque (dT=105K)	M_0	[Nm]	34.0	
Motor rated frequency	f_n	[Hz]	107	200
Motor rated voltage	V_n	[V_{AC}]	181	182
Rated Torque (dT=105K)	M_n	[Nm]	31	27.5
Current at rated speed	I_n	[A]	19.7	32.2
Standstill current	I_0	[A]	21.8	40.4
Max Torque	M_{max}	[Nm]	90	90
Max Current	I_{max}	[A]	66	121
Back EMF constant	K_e	[V/1000min^{-1}]	99	54
Torque constant	K_T	[Nm/A]	1.56	0.84
Rated Power	P_n	[kW]	5.2	8.6
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	0.30	0.09
Stator phase-phase Inductance	L_{pp}	[mH]	5.8	1.7
Rotor inertia	J_m	[kgm^2 x 10^{-4}]	28.2	
Electric time constant (at 20°C)	τ_{el}	[ms]	20	
Thermal time constant	τ_{therm}	[min]	50	
Motor mass without brake	m_M	[kg]	25	
Motor mass with brake	m_{MB}	[kg]	29.5	



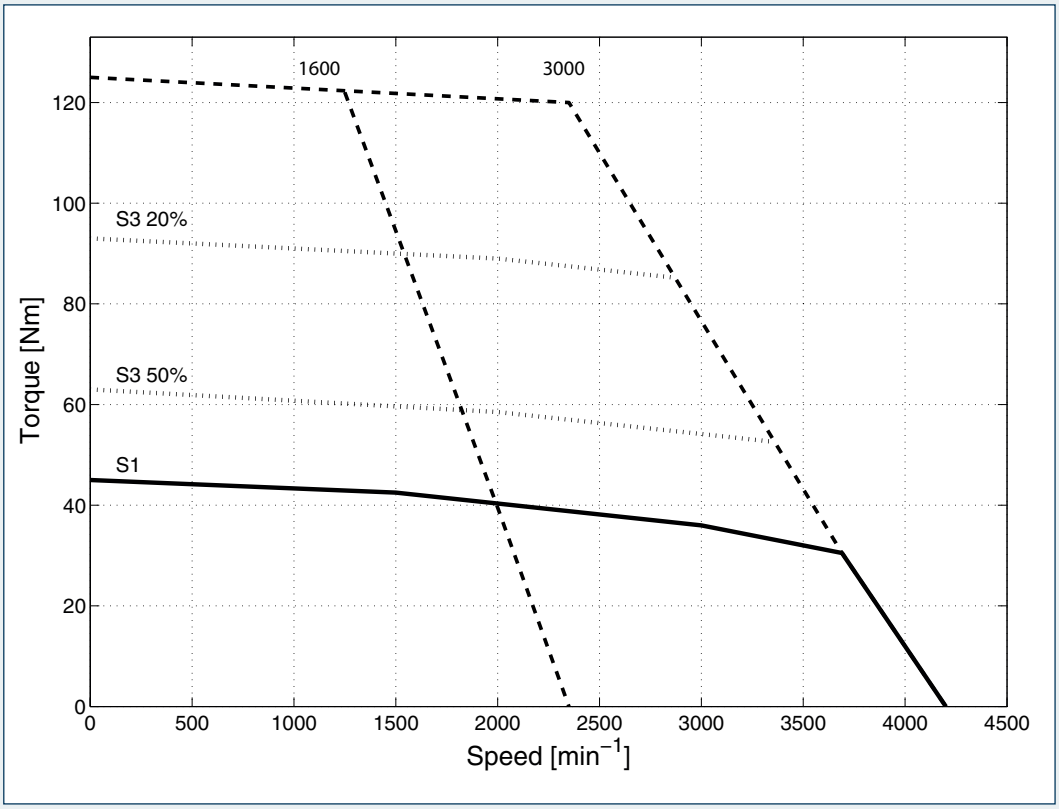
MMD 170 • 34 Nm - 400V

Parameter	Symbol	Unit	Speed [min^{-1}]	
			1600	3000
Standstill torque (dT=105K)	M_0	[Nm]	34.0	
Motor rated frequency	f_n	[Hz]	107	200
Motor rated voltage	V_n	[V_{AC}]	319	315
Rated Torque (dT=105K)	M_n	[Nm]	31	27.5
Current at rated speed	I_n	[A]	11.2	18.6
Standstill current	I_0	[A]	12.4	23.3
Max Torque	M_{max}	[Nm]	90	90
Max Current	I_{max}	[A]	37	70
Back EMF constant	K_e	[V/1000min^{-1}]	174	93
Torque constant	K_T	[Nm/A]	2.74	1.46
Rated Power	P_n	[kW]	5.2	8.6
Stator phase-phase Resistance (at 20°C)	R_{pp}	[Ω]	0.91	0.26
Stator phase-phase Inductance	L_{pp}	[mH]	17.9	5.1
Rotor inertia	J_m	[kgm^2 x 10^{-4}]	28.2	
Electric time constant (at 20°C)	τ_{el}	[ms]	20	
Thermal time constant	τ_{therm}	[min]	50	
Motor mass without brake	m_M	[kg]	25	
Motor mass with brake	m_{MB}	[kg]	29.5	

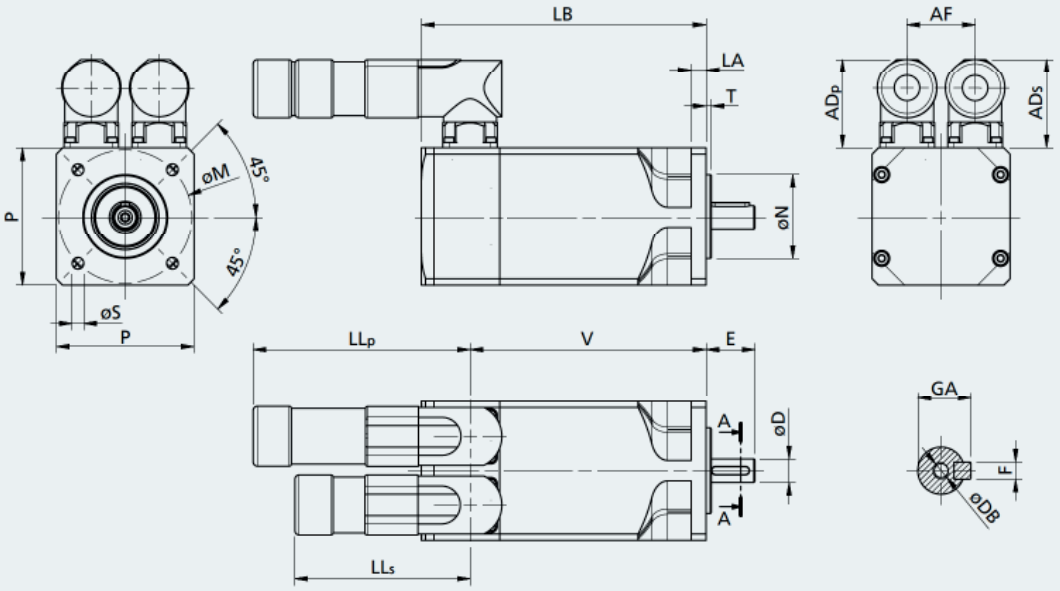


MMD 170 • 45 Nm - 400V

Parameter	Symbol	Unit	Speed [min $^{-1}$]	
			1600	3000
Standstill torque (dT=105K)	M_0	[Nm]	45.0	
Motor rated frequency	f_n	[Hz]	107	200
Motor rated voltage	V_n	[V_{AC}]	310	314
Rated Torque (dT=105K)	M_n	[Nm]	42	36
Current at rated speed	I_n	[A]	15.9	24.9
Standstill current	I_0	[A]	17.1	31
Max Torque	M_{max}	[Nm]	125	125
Max Current	I_{max}	[A]	52	96
Back EMF constant	K_e	[V/1000min $^{-1}$]	185	101
Torque constant	K_T	[Nm/A]	2.74	1.50
Rated Power	P_n	[kW]	7.0	11.3
Stator phase-phase Resistance (at 20°C)	R_{pp}	[W]	0.57	0.17
Stator phase-phase Inductance	L_{pp}	[mH]	11.1	3.3
Rotor inertia	J_m	[kgm ^{2} x 10 $^{-4}$]	47.5	
Electric time constant (at 20°C)	t_{el}	[ms]	19	
Thermal time constant	t_{therm}	[min]	65	
Motor mass without brake	m_M	[kg]	30	
Motor mass with brake	m_{MB}	[kg]	34.5	



Dimensions (from MMD 65 to MMD 102)



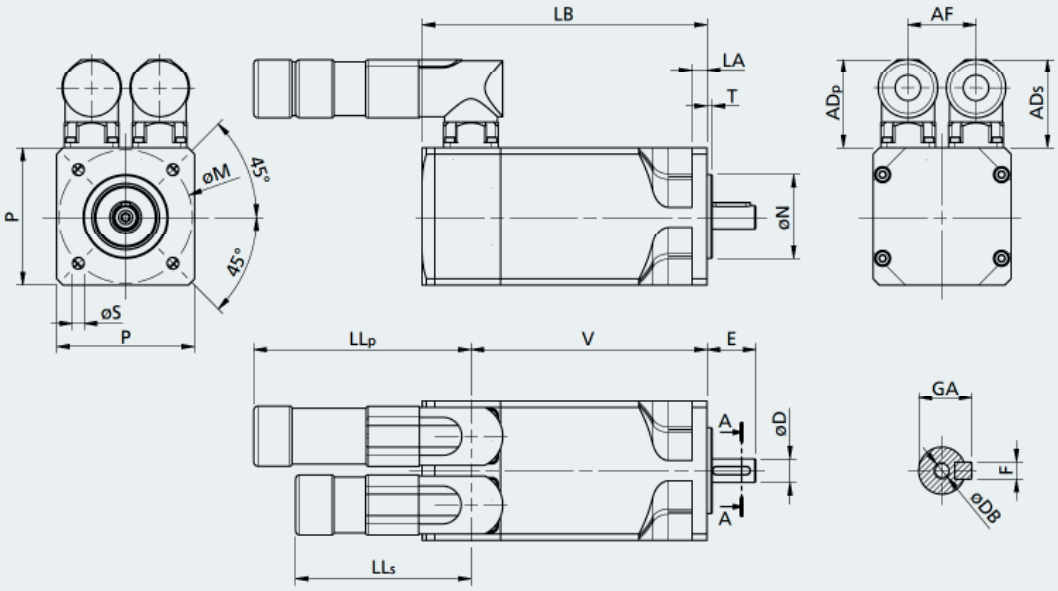
Type	Shaft				
	D	E	DB	GA(1)	F(1)
65	9	20	M3	10.2	3
	11	23	M4	12.5	4
82	11	23	M4	12.5	4
	14	30	M5	16	5
	19	40	M6	21.5	6
102	19	40	M6	21.5	6
	24	50	M8	27	8

Type	Flange					
	M	N	P	S	T	LA
65	63	40	65	5.5	2.5	7
	75	60	65	6	2.5	7
82	100	80	82	6.5	3	10
	115	95	100	9	3	10
102	100	80	102	7	3	10
	115	95	102	9	3	10

Type							Motor				
	T_0	AC	LB_2	LB_3	LB_4	LB_5	AD_P	AD_P	AF	LL_P	LL_S
65	0.85	65	112	143	130	179	41,5	41,5	32	96	96
	1.7		135	166	153	202					
	2.2		161	192	179	228					
82	3.2	82	160	200	183	246	41,5	41,5	36	96	96
	4.4		180	220	203	266					
102	7.2	102	180	220	203	266	41,5	41,5	39	96	96
	9.6		207	247	230	293					

Notes:
(1) Motor shaft extension without key available
LB_2 Motor length with resolver or in sensorless version without brake
LB_3 Motor length with resolver or in sensorless version with brake or flywheel
LB_4 Motor length with Hiperface encoder A0 without brake
LB_5 Motor length with Hiperface encoder A0 with brake or flywheel

Dimensions (from MMD 118 to MMD 170)



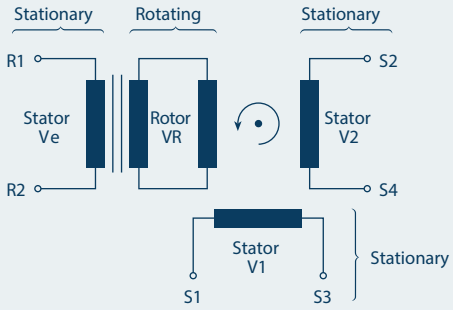
Type	Shaft				
	D	E	DB	GA(1)	F(1)
118	19	40	M6	21.5	6
	24	50	M8	27	8
	28	60	M10	31	8
145	19	40	M6	21.5	6
	24	50	M8	27	8
	28	60	M10	31	8
170	24	50	M8	27	8
	28	60	M10	31	8
	32	60	M12	35	10

Type	Flange					
	M	N	P	S	T	LA
118	130 (2)	95	118	9	3.5	10
	130	110	118	9	3.5	10
	165	130	145	11.5	3.5	10
145	165	130	145	11.5	3.5	12
170	165	130	170	11.5	3.5	12

Type							Motor				
	T_0	AC	LB_2	LB_3	LB_4	LB_5	AD_P	AD_P	AF	LL_P	LL_S
118	10.2	118	210	260	210	260	41,5	41,5	32	96	96
	14		243	293	243	293					
145	16.8	145	230	280	230	280	41,5	41,5	36	96	96
	22		265	315	265	315					
102	34	170	265	340	303	378	41,5	41,5	39	96	96
	45		319	394	357	432					

Notes:
(1) Motor shaft extension without key available
(2) Mechanical interface 130S
LB_2 Motor length with resolver or in sensorless version without brake
LB_3 Motor length with resolver or in sensorless version with brake or flywheel
LB_4 Motor length with Hiperface encoder A0 without brake
LB_5 Motor length with Hiperface encoder A0 with brake or flywheel

Feedback devices: Resolver datasheet



Item	BMD65	BMD82-BMD170
	RES2	RES1
Poles number	2	2
Transformation ratio	0.5±5%	$0.5^{+15\%}_{-5\%}$
Input voltage [Vac_{ms}]	7	11
Input current [mA]	65	57
Input frequency [kHz]	10	8
Phase shift	0º	-11º
Input impedance Zro (W)	70+j100	75+j185
Input impedance Zss (W)	175+j275	135+j265
Electrical error	±10′	±10′
Accuracy ripple	1′max	1′max
Operating temperature	-55°C...+155°C	-55°C...+155°C
Max Speed [min^{-1}]	10000	20000
Mass [kg]	0.065	0.28
Rotor Inertia [$Kgm^2 x10^{-6}$]	3.0	5.0

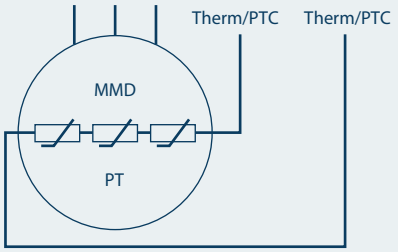
Encoder datasheet

SICK ENCODERS

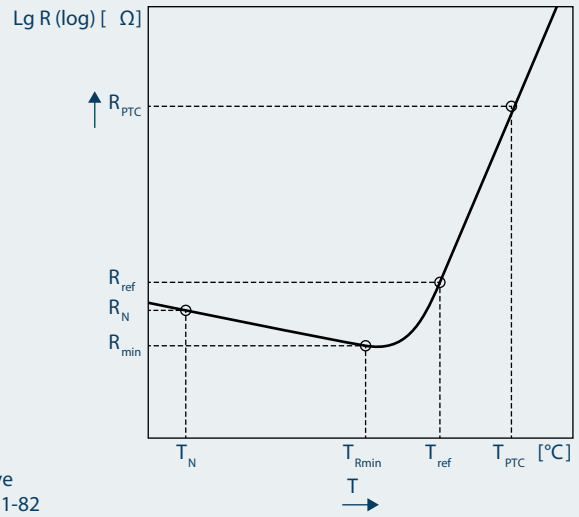
Item	BMD65-170
	A0
Data interface	Hiperface
Model	SKM36
Type	Multi turn
Power supply	7VDC ... 12VDC
Current consumption	60mA
Periods per revolution	128
Position per revolution	4096 (12 bits)
Revolutions	4096 (12 bits)
Operating temperature	-30ºC...+110ºC
Max Speed [min $^{-1}$]	10000
Mass [kg]	0.07
Rotor Inertia [Kgm ^{2} x10^{-6}]	0.45

PTC/KTY thermal protection

All motors in the MMD Series are equipped with an integrated PTC temperature as standard to protect the windings against overtemperatures exceeding the limit of the motor class F insulation.
These sensors are in conformity to standard DIN 44081-82.
Optionally a KTY sensor is available, to fit any needs for temperature feedback.
The PTC temperature sensor consists of a special ceramic resistor whose ohmic value varies with the temperature of the electrical winding with which it is held on close contact. Each temperature value generates a known resistance, so that provided the resistor is fed at a constant voltage, the output current can be used to determine the corresponding temperature. If temperature reaches an established limit, the circuit monitoring the signal trips the necessary cutout to disconnect power to the motor and prevent damage.



A triple PTC thermistor rated to 150°C is placed into the motor winding. The resistance curve of the PTC thermistor is in accordance with DIN 44081-82.



PTC characteristic curve
according to DIN 44081-82

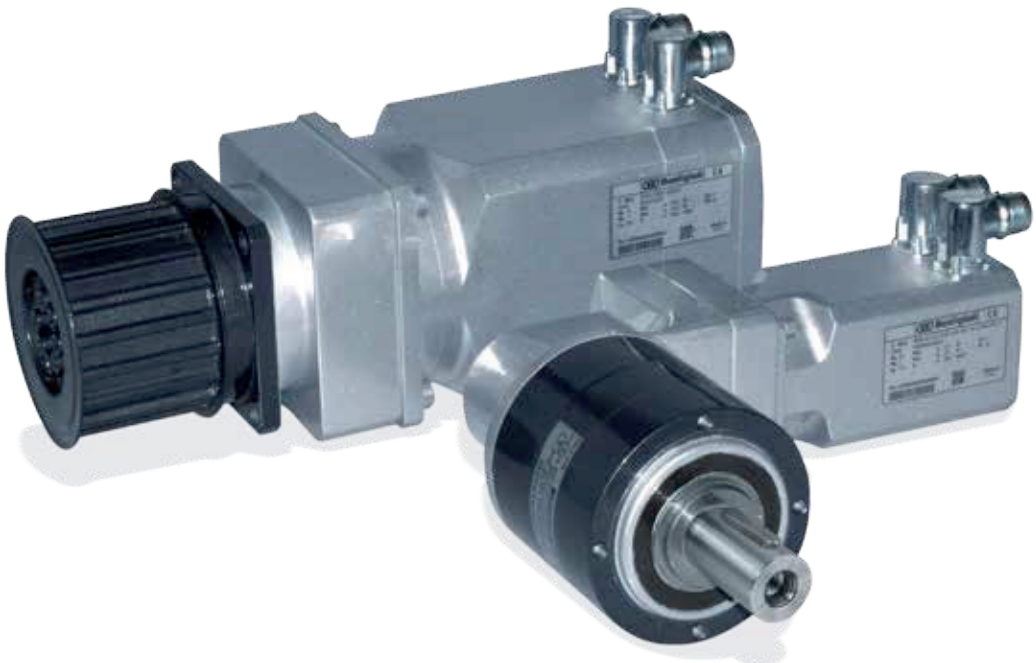
Servo gearheads

Motion application requires the use of precision planetary gearboxes to adapt speeds and torques, while ensuring the precision demanded by the application.
Bonfiglioli Riduttori has chosen to use planetary gearboxes with the MMD range of servo motors.
Bonfiglioli precision planetary gearboxes (PPG) match withMMD Permanent Magnet synchronous motors and provide industrial motion control equipment with torque multiplication and proper inertial matching.
These gearheads combined with powerful drive electronics are designed for servo applications requiring highest standards in terms of dynamics, precision, robustness, durability, and long trouble-free operation.

Low backlash at a competitive price.
The LC Series of planetary gearboxes is characterized by low backlash, silent running and easy motor coupling.

High precision for excellent results.
The MP Series of low backlash planetary gearboxes is characterized by a wide range of mounting configurations, silent running, and superbly easy motor coupling.

Maximum precision for highly dynamic applications.
The TQ Series of precision planetary gearboxes is designed to deliver the highest level of transmission precision. Low backlash combined with a high torsional stiffness guarantees a very performing product, for in high dynamic and reversing applications. The technical design of this gearbox also allows high axial and radial loads on the output shaft.



MMD Servomotor / LC series Precision Planetary Gearbox combination

Ratios from 3:1 to 70:1

Type	Motor stall torque	Ratios											Motor inertia
	[Nm]	3:1	4:1	5:1	7:1	10:1	16:1	20:1	25:1	40:1	50:1	70:1	kgm ^{2} x 10 $^{-3}$
MMD 65	0.85		LC 050	LC 050	LC 050	LC 050 LC 070	LC 090	LC 090	LC 090	LC 090 LC 120	LC 090 LC 120	LC 120	0.02
	1.7	LC 050 LC 070	LC 050 LC 070	LC 050 LC 070	LC 070 LC 090	LC 070 LC 090	LC 090	LC 090 LC 120	LC 090 LC 120	LC 120	LC 120		0.04
	2.2	LC 050 LC 070	LC 050 LC 070	LC 050 LC 070	LC 070 LC 090	LC 090	LC 090	LC 090 LC 120	LC 120	LC 120	LC 120		0.06
MMD 82	3.2	LC 050 LC 070	LC 070 LC 090	LC 070 LC 090	LC 070 LC 090	LC 090 LC 120	LC 120	LC 120	LC 120 LC 155	LC 155	LC 155		0.14
	4.4	LC 070 LC 090	LC 070 LC 090	LC 070 LC 090	LC 070 LC 090	LC 120	LC 120	LC 120	LC 120 LC 155	LC 155	LC 155		0.17
MMD 102	7.2	LC 090	LC 090	LC 090 LC 120	LC 120	LC 120 LC 155	LC 155	LC 155	LC 155	LC 155			0.34
	9.6	LC 090	LC 090	LC 090 LC 120	LC 120	LC 155	LC 155	LC 155	LC 155				0.47
MMD 118	10.2	LC 090 LC 120	LC 120	LC 120	LC 120	LC 155	LC 155	LC 155	LC 155				0.9
	14	LC 120	LC 120	LC 120	LC 120	LC 155	LC 155	LC 155					0.99
MMD 145	16.8	LC 120	LC 120	LC 120 LC 155	LC 155	LC 155	LC 155						1.4
	22	LC 120	LC 120	LC 120 LC 155	LC 155	LC 155							1.76
MMD 170	34	LC 155	LC 155	LC 155	LC 155								2.9
	45	LC 155	LC 155	LC 155									4.75

Distribution of gearbox output torque [Nm]											
	3	4	5	7	10	16	20	25	40	50	70
LC 050	10	12	12	12	-	12	12	12	-	-	-
LC 070	18	25	25	25	18	25	25	25	25	25	25
LC 090	37	43	43	43	37	43	43	43	43	43	43
LC 120	95	110	110	110	95	110	110	110	110	110	110
LC 155	250	300	300	300	250	300	300	300	300	300	300

Notes:
Input speed lower than 3000 min $^{-1}$.
Safety factor $1 < S \leq 4$.
For any additional technical information about gearboxes selection see relevant catalogues.

MMD Servomotor / MP series Precision Planetary Gearbox combination

Ratios from 3:1 to 70:1

Type	Motor stall torque	Ratios												Motor inertia
	[Nm]	3:1	4:1	5:1	6:1	7:1	10:1	16:1	20:1	25:1	40:1	50:1	70:1	kgm ^{2} x 10 $^{-3}$
MMD 65	0.85			MP 053	MP 053	MP 053	MP 060	MP 053 MP 060	MP 053 MP 060	MP 060 MP 080	MP 080	MP 080	MP 080	0.02
	1.7	MP 053 MP 060	MP 053 MP 060	MP 053 MP 060	MP 053 MP 060	MP 053 MP 060	MP 060 MP 080	MP 060 MP 080	MP 080 MP 080	MP 080 MP 080	MP 080 MP 105	MP 105 MP 105	MP 105 MP 105	0.04
	2.2	MP 053 MP 060	MP 053 MP 060	MP 053 MP 060	MP 053 MP 060	MP 053 MP 060	MP 060 MP 080	MP 080	MP 080 MP 080	MP 080 MP 080	MP 080 MP 105	MP 105 MP 105	MP 105 MP 105	0.06
MMD 82	3.2	MP 053 MP 060	MP 053 MP 060	MP 060 MP 080	MP 060 MP 080	MP 060 MP 080	MP 080 MP 105	MP 080 MP 105	MP 080 MP 105	MP 105	MP 105 MP 130	MP 105 MP 130	MP 130 MP 160	0.14
	4.4	MP 060	MP 060	MP 060 MP 080	MP 060 MP 080	MP 060 MP 080	MP 080 MP 105	MP 080 MP 105	MP 080 MP 105	MP 105	MP 105 MP 130	MP 105 MP 130	MP 130 MP 160	0.17
MMD 102	7.2	MP 080	MP 080	MP 080	MP 080 MP 105	MP 080 MP 105	MP 105	MP 105	MP 105 MP 130	MP 130	MP 130 MP 160	MP 130 MP 160	MP 160	0.34
	9.6	MP 080	MP 080	MP 080	MP 105	MP 105	MP 105	MP 105	MP 105 MP 130	MP 130	MP 130 MP 160	MP 130 MP 160	MP 160	0.47
MMD 118	10.2	MP 105	MP 105	MP 105	MP 105	MP 105	MP 130 MP 160	MP 130	MP 130 MP 160	MP 130 MP 160	MP 130 MP 160	MP 160	MP 190	0.9
	14	MP 105	MP 105	MP 105	MP 105	MP 105	MP 130 MP 160	MP 130	MP 130 MP 160	MP 130 MP 160	MP 130 MP 160	MP 160	MP 190	0.99
MMD 145	16.8	MP 105	MP 105	MP 105	MP 105 MP 130	MP 105 MP 130	MP 130 MP 160	MP 130 MP 160 MP 190	MP 130 MP 160 MP 190	MP 160 MP 190	MP 160 MP 190	MP 190		1.4
	22	MP 105	MP 105	MP 105	MP 105 MP 130	MP 130	MP 160	MP 130 MP 160 MP 190	MP 130 MP 160 MP 190	MP 160 MP 190	MP 160 MP 190	MP 190		1.76
MMD 170	34	MP 105	MP 105 MP 130	MP 130	MP 130	MP 130	MP 160	MP 160 MP 190	MP 160 MP 190	MP 190				2.9
	45	MP 130	MP 130	MP 130	MP 130 MP 160	MP 130 MP 160	MP 190	MP 160 MP 190	MP 160 MP 190	MP 190				4.75

Distribution of gearbox output torque [Nm]												
	3	4	5	6	7	10	16	20	25	40	50	70
MP 053	12	15	15	15	15	-	20	20	20	-	-	-
MP 060	18	25	25	25	25	18	30	30	30	30	30	30
MP 080	40	50	50	50	50	40	70	70	70	70	70	70
MP 105	100	140	140	140	140	100	170	170	170	170	170	170
MP 130	215	380	380	380	380	215	450	450	450	450	450	450
MP 160	350	500	500	500	500	350	700	700	700	700	700	700
MP 190	500	700	700	700	700	500	1000	1000	1000	1000	1000	1000

Notes:
Input speed lower than 3000 min $^{-1}$.
Safety factor $1 < S \leq 4$.
For any additional technical information about gearboxes selection see relevant catalogues.

MMD Servomotor / TQ series Precision Planetary Gearbox combination

Ratios from 3:1 to 70:1

Type	Motor stall torque	Ratios											Motor inertia
	[Nm]	3:1	4:1	5:1	7:1	10:1	16:1	20:1	25:1	40:1	50:1	70:1	kgm ^{2} x 10 $^{-3}$
MMD 65	0.85					TQ 060	TQ 060	TQ 060	TQ 060 TQ 070	TQ 070	TQ 070	TQ 070	0.02
	1.7	TQ 060 TQ 070	TQ 060 TQ 070	TQ 060 TQ 070	TQ 060 TQ 070	TQ 060 TQ 070	TQ 060 TQ 070	TQ 070	TQ 070	TQ 070			0.04
	2.2	TQ 060 TQ 070	TQ 060 TQ 070	TQ 060 TQ 070	TQ 060 TQ 070	TQ 070	TQ 070	TQ 070	TQ 070				0.06
MMD 82	3.2	TQ 070	TQ 070	TQ 070	TQ 070	TQ 090	TQ 070	TQ 070	TQ 090	TQ 090	TQ 090		0.14
	4.4	TQ 070	TQ 070	TQ 070	TQ 070	TQ 090	TQ 090	TQ 090	TQ 090	TQ 090			0.17
MMD 102	7.2	TQ 070	TQ 090	TQ 090 TQ 090	TQ 070 TQ 090	TQ 090	TQ 090	TQ 090	TQ 090	TQ 090			0.34
	9.6	TQ 070	TQ 090	TQ 090 TQ 090	TQ 070 TQ 090	TQ 090	TQ 090	TQ 130	TQ 130	TQ 130			0.47
MMD 118	10.2	TQ 070 TQ 090	TQ 070 TQ 090	TQ 070 TQ 090	TQ090	TQ090	TQ 130	TQ 130	TQ 130	TQ 160	TQ 160		0.9
	14	TQ 090	TQ 090	TQ 090	TQ 090 TQ130	TQ130	TQ 130	TQ 130	TQ 130	TQ 160	TQ 160		0.99
MMD 145	16.8	TQ 090	TQ 090	TQ 090	TQ 090 TQ130	TQ130	TQ 160	TQ 160	TQ 160	TQ 160			1.4
	22	TQ 090	TQ 090	TQ 090	TQ 090 TQ130	TQ130	TQ 160	TQ 160	TQ 160				1.76
MMD 170	34	TQ 090 TQ 130	TQ 090 TQ 130	TQ 090 TQ 130	TQ130	TQ 160	TQ 160	TQ 160					2.9
	45	TQ 130	TQ 130	TQ 130	TQ130	TQ 160	TQ 160						4.75

Distribution of gearbox output torque [Nm]											
	3	4	5	7	10	16	20	25	40	50	70
TQ 060	21	30	30	25	20	30	30	30	30	30	25
TQ 070	45	70	70	60	40	70	70	70	70	70	60
TQ 090	130	200	180	160	110	200	180	180	200	180	160
TQ 130	260	400	400	360	280	400	400	400	400	400	360
TQ 160	530	800	800	750	550	800	800	800	800	800	750

Notes:
Input speed lower than 3000 min $^{-1}$.
Safety factor $1 < S \leq 4$.
For any additional technical information about gearboxes selection see relevant catalogues.

Additional inertia feature

MMD Permanent Magnet AC Synchronous Motor series is provided optionally with additional inertia.
The MMD motors with additional inertia have higher rotor moment of inertia in comparison with basic version.

Additional inertia is designed to be used in application with high load inertia. The increased rotor moment of inertia provides a comfortable control response due to "higher" inertial matching of the machine.

Motor	Motor stall torque	Additional inertia	Additional weight
	Nm	Kgm^2x10^{-4}	kg
65	0.85	0.5	0.3
	1.7		
	2.2		
82	3.2	3	0.7
	4.4		
102	7.2	7.5	1.3
	9.6		
118	10.2	15	2.4
	14		
145	16.8	35	3.6
	22		
170	34	70	5.5
	45		

Produtc designation

MMD	65	1.7	3000	400	63	11	NK	65	TC1	RES2	P1N	S1N	-	-	1,26

Kt
value of the kt motors

Flywheel*
(blank): no flywheel (default)
F1: flywheel

*if F24 is present, F1 can not be and vice versa

Brake*
(blank): no brake (default)
F24: brake 24Vdc

Signal connector
S1: rotatable connector, with plug
S1N: rotatable connector, without plug (default)

Power connector
P1: rotatable connector, with plug
P1N: rotatable connector, without plug (default)

Feedback device
SEN: sensorless
RES1: 2 poles resolver 8kHz for all sizes except size 65 (default)
RES2: 2 poles resolver 10kHz only for size 65 (default)
A0: encoder Hiperface Multi Turn SKM36 (128 sin)

Thermal protection
TC1: PT1000

Degree protection
65: IP65 (default)
67: IP67

Shaft keway
K: with key
NK: without key (default)

Shaft diameter
9: size 65
11: size 65, 82
14: size 82
19: size 82, 102, 118, 145
24: size 102, 118, 145, 170
28: size 118,145, 170
32: size 170

Mechanical Interface (ref to M value of the flange dimension - MMD catalogue)
63: size 65
75: size 65
100: size 82, 102
115: size 82, 102
130: size 118
130S: size 118
165: size 118, 145, 170

Motor AC voltage: **See the following table
230
400

Motor rated speed: **See the following table
1600 (min^{-1})
3000 (min^{-1})
4500 (min^{-1})
5000 (min^{-1})
6000 (min^{-1})

Motors stall torque: **See the following table

0.85 (Nm): size 65	10.2 (Nm): size 118
1.7 (Nm): size 65	14 (Nm): size 118
2.2 (Nm): size 65	16.8 (Nm): size 145
3.2 (Nm): size 82	22 (Nm): size 145
4.4 (Nm): size 82	34 (Nm): size 170
7.2 (Nm): size 102	45 (Nm): size 170
9.6 (Nm): size 102	

Motors size:
65,82,102,118,170

Produtc designation

**Possible combinations

Type	230 Vac					400Vac				
	1600	3000	4500	5500	6000	1600	3000	4500	5500	6000
MMD65 0.85	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MMD65 1.7	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MMD65 2.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MMD82 3.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MMD82 4,4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MMD102 7.2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MMD102 9,6	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MMD118 10,2	✓	✓	✓	✓	×	✓	✓	✓	✓	✓
MMD118 14	✓	✓	×	×	×	✓	✓	✓	✓	✓
MMD145 16,8	✓	✓	×	×	×	✓	✓	✓	✓	✓
MMD145 22	✓	✓	×	×	×	✓	✓	✓	✓	×
MMD170 34	✓	✓	×	×	×	✓	✓	×	×	×
MMD170 45	×	×	×	×	×	✓	✓	×	×	×

FACTORY AND
HEADQUARTERS

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