aerospace
climate control
electromechanical
filtration
fluid & gas handling
hydraulics
pneumatics
process control
sealing & shielding

Brushless Servo Motors

SMH / SMB Motors from 0.35 to 15 Nm
MH / MB Motors from 0.2 to 285 Nm

Parker

ENGINEERING **YOUR** SUCCESS.

Contents

SMH / SMB

Servo Motors for Complex and Demanding Applications

The SMH / SMB Series of highly-dynamic brushless servo motors have been designed to combine the cutting-edge technology of Parker Hannifin products with an extremely high performance.

Thanks to the innovative "salient pole" technology, the motor dimensions are drastically reduced with significant advantages in terms of specific torque, overall dimensions and dynamic performances. Compared to traditional-technology brushless servo motor, the specific torque is about 30 % higher, overall dimensions are considerable reduced and, consequently rotor inertias are extremely low. Thanks to the high quality of Neodymium-Iron-Boron magnets, and also the encapsulation method used to fasten them to the shaft, the SMH / SMB motors can achieve very high accelerations and withstand high overloads without risk of demagnetisation or detachment of the magnets.

Specific applications of the SMH / SMB Series include any type of automation machinery, especially packaging and handling industry, and all those applications where very high dynamic performances and very low inertias are required.

Technical Data from 0.35 to 15 Nm

TECHNICAL SPECIFICATIONS	
Power supply	230 VAC or 400 VAC
Protection	IP64/IP65 optional
Ambient temperature	-10/+40 °C

Options

- Flying cables
- Terminal box (power and resolver)
- External encoder
- Increased inertia
- Brake
- Feedback - resolver, incremental, SinCos, absolute encoder very high dynamic, low inertia

- 2-pole resolver feedback
- 8 poles motor (10 poles SMB 42)
- NdFeB magnets
- Insulation cabling class F, winding class H
- Bearing lubrificated for life

Motors for 230 VAC power supply

Model	Size	Stall Torque $T_{065}(T_{105})$ [Nm]	Stall Current I_{065} [A]	Nominal Torque T_{n065} [Nm]	Nominal Speed ω [min⁻¹]	Nominal Current I_{n065} [A]	Peak Torque T_{max} [Nm]	Inertia No brake J [kgm²·10⁻³]	Inertia With brake J [kgm²·10⁻³]	Ke K_e [Vs]	Kt K_t [Nm/Arms]
SMB 42 60 0,35...230	42	0.35	0.78	0.15	6000	0.38	0.9	0.013	------	0.29	0.46
SMH 60 30 0,55...230		0.55 (0.68)	0.7	0.48	3000	0.63	1.7	0.018	0.0305	0.44	0.76
SMH 60 45 0,55...230			1.0	0.39	4500	0.74				0.30	0.53
SMH 60 60 0,55...230			1.4	0.24	6000	0.60				0.23	0.40
SMH 60 30 1,4...400	60	1.4 (1.7)	0.95	1.35	1600	0.91	4.4	0.03	0.0425	0.85	1.48
SMH 60 60 1,4...400			1.73	1.20	3000	1.50				0.47	0.81
SMH 60 45 1,4...230			2.37	1.00	4500	1.69				0.34	0.59
SMH 60 60 1,4...230			2.98	0.80	6000	1.70				0.27	0.47
SMH 60 75 1,4...230			3.85	0.15	7500	0.41				0.21	0.36
SMH 82 10 03...230		3 (3.7)	1.2	2.9	1000	1.2	9	0.14	0.183	1.43	2.48
SMH 82 30 03...400			1.8	2.9	1600	1.8				0.96	1.66
SMH 82 56 03...400			3.1	2.7	3000	2.8				0.55	0.96
SMH 82 60 03 ...400	82		3.5	2.4	3300	2.8				0.49	0.85
SMH 82 45 03 ...230			4.7	2.2	4500	3.4				0.37	0.64
SMH 82 60 03 ...230			6.1	1.5	6000	3.1				0.28	0.49
SMH 82 75 03 ...230			7.5	0.6	7500	1.6				0.23	0.40
SMH 100 30 06...400		6 (9)	3.7	5.8	1600	3.6	18	0.336	0.44	0.92	1.60
SMH 100 56 06...400			5.9	5.0	3000	4.9				0.59	1.02
SMH 100 75 06...400	100		9.4	3.5	4500	5.5				0.37	0.64
SMH 100 55 06...230			11.8	2.6	5500	5.1				0.29	0.51
SMH 100 75 06...230			14.7	0.6	7500	1.5				0.24	0.41
SMH 115 30 10...400		10 (12.5)	6.0	9.0	1600	5.42	32	0.9	1	0.96	1.66
SMH 115 56 10...400	115		10.5	8.0	3000	8.40				0.55	0.95
SMH 115 40 10...230			14.7	7.6	4000	11.19				0.39	0.68
SMH 115 54 10...230			18.2	7.1	5400	12.93				0.32	0.55
SMH 142 30 15...400	142	15 (19)	9.7	13.3	1800	8.6	47	1.4	1.6	0.89	1.54
SMH 142 56 15...400			16.0	12.5	3000	13.4				0.54	0.94

Motors for 400 VAC power supply

Model	Size	Stall Torque $T_{065}(T_{105})$ [Nm]	Stall Current I_{065} [A]	Nominal Torque T_{n065} [Nm]	Nominal Speed ω [min⁻¹]	Nominal Current I_{n065} [A]	Peak torque T_{max} [Nm]	Inertia No brake J [kgm²·10⁻³]	Inertia With brake J [kgm²·10⁻³]	Ke K_e [Vs]	Kt K_t [Nm/Arms]
SMH 60 30 1,4...400		1.4 (1.7)	0.95	1.2	3000	0.81	4.4	0.03	0.0425	0.81	1.48
SMH 60 45 1,4...400	60		1.37	1.0	4500	0.98				0.59	1.02
SMH 60 60 1,4...400			1.73	0.8	6000	0.99				0.68	0.81
SMH 60 75 1,4...400			2.15	0.15	7500	0.23				0.38	0.65
SMH 82 30 03...400		3 (3.7)	1.8	2.7	3000	1.6	9	0.14	0.183	0.96	1.66
SMH 82 45 03 ...400			2.7	2.2	4500	2.0				0.64	1.11
SMH 82 56 03 ...400	82		3.1	1.6	5600	1.7				0.55	0.96
SMH 82 60 03...400			3.5	1.7	6000	2.0				0.49	0.85
SMH 82 75 03...400			4.4	0.6	7500	0.9				0.39	0.68
SMH 100 30 06...400		6 (9)	3.7	5.0	3000	3.1	18	0.336	0.44	0.92	1.60
SMH 100 45 06...400	100		5.6	3.5	4500	3.3				0.62	1.07
SMH 100 56 06...400			5.9	2.5	5600	2.4				0.59	1.02
SMH 100 75 06...400			9.4	0.6	7500	0.9				0.37	0.64
SMH 115 20 10...400		10 (12.5)	4.5	9.0	2000	4.06	32	0.9	1	1.28	2.22
SMH 115 30 10...400	115		6.0	8.0	3000	4.82				0.96	1.66
SMH 115 40 10...400			8.0	7.6	4000	6.05				0.73	1.26
SMH 115 56 10...400			10.5	6.0	5600	6.30				0.55	0.95
SMH 142 20 15...400		15 (19)	6.4	13.0	2000	5.5	47	1.4	1.6	1.36	2.35
SMH 142 30 15...400	142		9.7	12.5	3000	8.1				0.89	1.54
SMH 142 45 15...400			14.4	10.9	4500	10.5				0.60	1.04
SMH 142 56 15...400			16.0	9.2	5600	9.8				0.54	0.94

These data are referred to a 20 °C ambient temperature

Curves

SMB 42
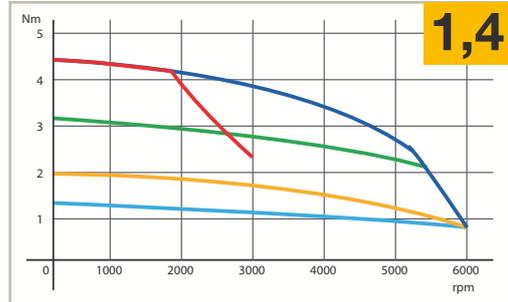
6000 min⁻¹ **230 V**
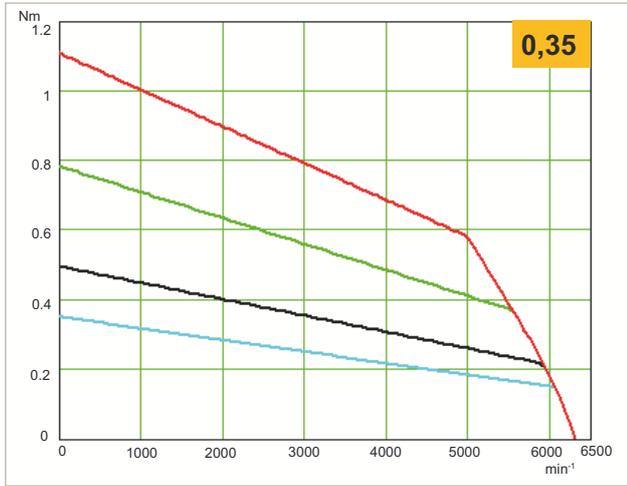
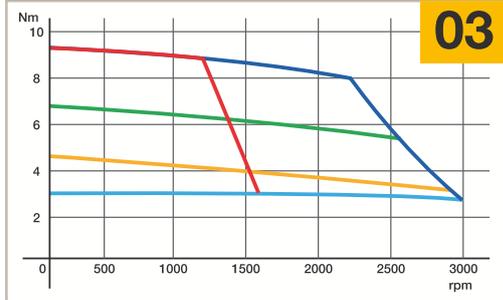## SMH 60

1600rpm 230V - 3000rpm 400V
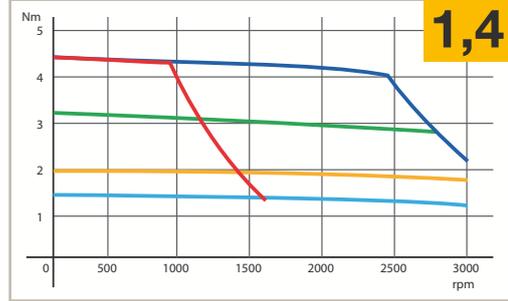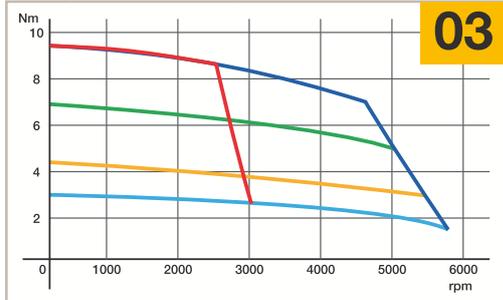

3000rpm 230V - 6000rpm 400V

■ S1 65K ΔT   ■ S3 50% 5min   ■ S3 20% 5min
■ S3 10% 5min 230V   ■ S3 10% 5min 400V

SMH 82

1600rpm 230V - 3000rpm 400V

3000rpm 230V - 5600rpm 400V

■ S1 65K ΔT   ■ S3 50% 5min   ■ S3 20% 5min
■ S3 10% 5min 230V   ■ S3 10% 5min 400V

SMH 100

1600rpm 230V - 3000rpm 400V

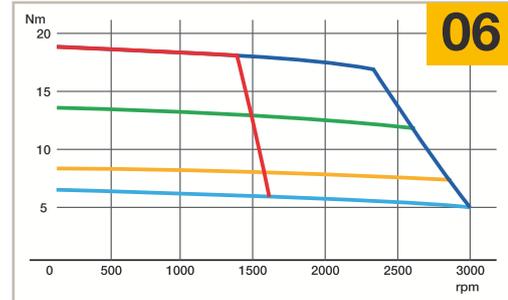**3000rpm 230V - 5600rpm 400V**

■ S1 65K ΔT   ■ S3 50% 5min   ■ S3 20% 5min
■ S3 10% 5min 230V   ■ S3 10% 5min 400V

SMH 115

1600rpm 230V - 3000rpm 400V

3000rpm 230V - 5600rpm 400V

S1 65K ΔT   S3 50% 5min   S3 20% 5min
S3 10% 5min 230V   S3 10% 5min 400V

SMH 142

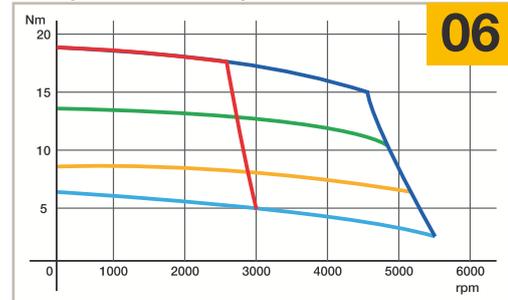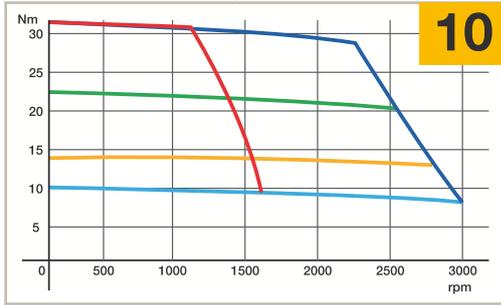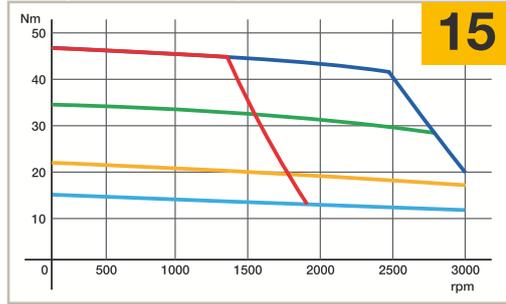**1800rpm 230V - 3000rpm 400V**
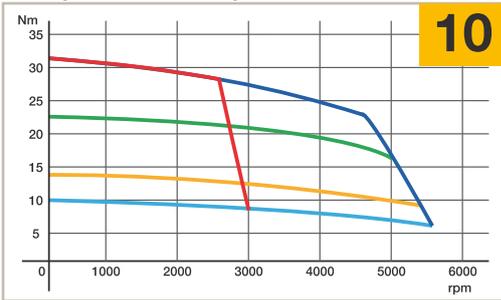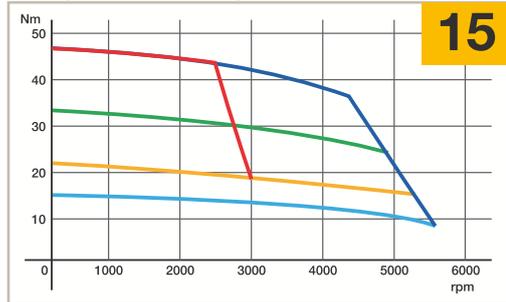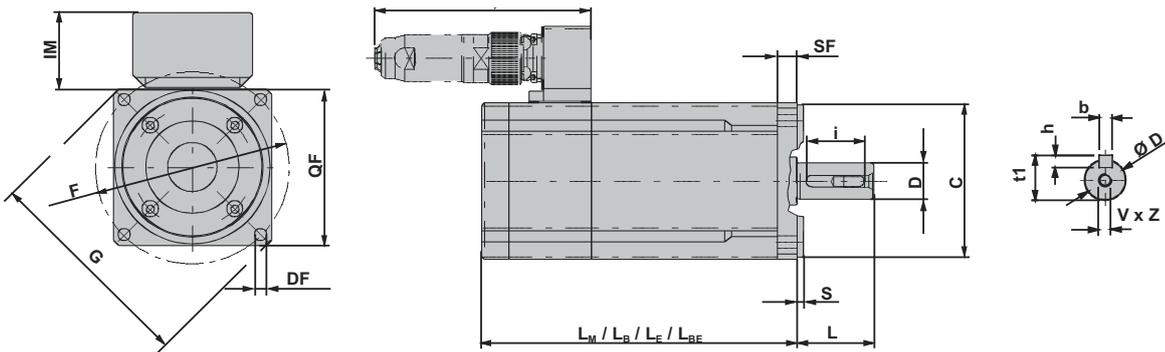

3000rpm 230V - 5600rpm 400V

S1 65K ΔT   S3 50% 5min   S3 20% 5min
S3 10% 5min 230V   S3 10% 5min 400V

Dimensions and Weights

SMB 42
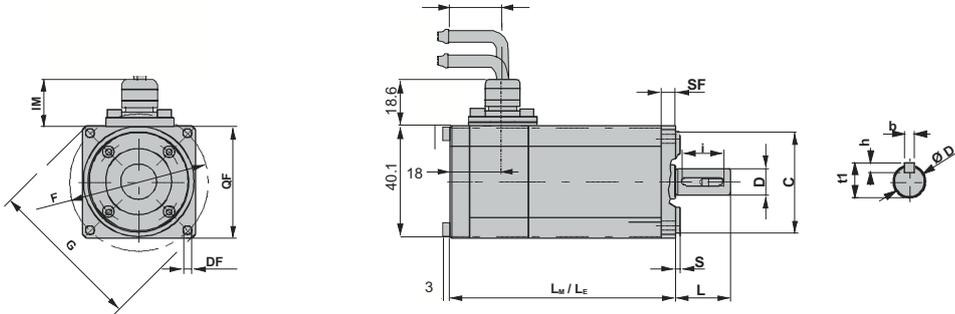
SMH 60 - 142

Servo motor	Type	LM/LB/ LE/LBE	SF	IM	Flange	DF	F	D x L	b x h x i	t1	V x Z	QF	C x S		G	kg
SMB 42	0.35	100/--/--/--	6	--	5	3.2	50	9 x 25	----	--	M3 x 9	42	Ø30	j6 x 2.5	57	1
SMH 60	1.4	129.5/161/ 163/209/ 142.5/187.5	7	40	8	5.5	63	9 x 20 11 x 23	3 x 3 x 16 4 x 4 x 18	10.2	---	60	Ø40	h6 x 2.5	74	1.5
					5	6.0	75			12.5	M4 x 10	70	Ø60		90	
SMH 82	03	163.5/206.5/ 183.5/226.5	10	40	8	6.5	100	14 x 30	5 x 5 x 25	16.0	M5 x 12.5	82	Ø80	h6 x 3.5	112	3.6
					5	9.0	115	19 x 40	6 x 6 x 30	21.5	M6 x 16	100	Ø95		135	
SMH 100	06	191.5/238.5/ 211.5/258.5	10	40	5	9.0	115	19 x 40	6 x 6 x 30	21.5	M6 x 16	100	Ø95	h6 x 3.5	135	4.7
								24 x 50	8 x 7 x 40	27.0	M8 x 19					
SMH 115	10	220/265/ 220/265	10	41.5	8	9.0	130	19 x 40	6 x 6 x 30	21.5	M6 x 16	115	Ø95	h6 x 3.5	156	7.7
					7	9.0	130	24 x 50	8 x 7 x 40	27.0	M8 x 19	130	Ø110		156	
					5	11	165	28 x 60	8 x 7 x 50	31.0	M10 x 22	145	Ø130		196.5	
SMH 142	15	243/293/ 243/293	12	41.5	5	11	165	19 x 40	6 x 6 x 30	21.5	M6 x 16	142	Ø130	h6 x 3.5	192.5	13
								24 x 50	8 x 7 x 40	27.0	M8 x 19					
								28 x 60	8 x 7 x 50	31.0	M10 x 22					

mm for dimensions, kg for weight

Feedback Details

Code	Description
Incremental encoder	
A1	Incremental encoder 2000 i/t, 8 poles Precision ±32", Differential Line Driver 20 mA
A2	Incremental encoder 2048 i/t, 8 poles Precision ±32", Differential Line Driver 20 mA
A3	Incremental encoder 4096 i/t, 8 poles Precision ±16", Differential Line Driver 20 mA
B1	Incremental encoder 3000 i/t, 4 poles Precision ±22", Differential Line Driver 20 mA
B3	Incremental encoder 2048 i/t, 8 poles Precision ±32", Differential Line Driver 20 mA
B8	Incremental encoder 3000 i/t, 8 poles Precision ±22", Differential Line Driver 20 mA
C2	Incremental encoder 2048 i/t, 4 poles Precision ±32", Differential Line Driver 20 mA
Absolute encoder Hiperface	
C6	Single turn optical encoder, 1 Vpp, 128 sinusoid/t, Hiperface Protocol, 4096 positions/g Precision ±320"
C7	Single turn optical encoder, 1 Vpp, 128 sinusoid/t, Hiperface Protocol, 4096 positions/g, 4096 turns Precision ±320"
A6	Single turn optical encoder, 1 Vpp, 1024 sinusoid/t, Hiperface Protocol, 32 768 positions/g Precision ±90"
A7	Single turn optical encoder, 1 Vpp, 1024 sinusoid/t, Hiperface Protocol, 32 768 positions/g, 4096 turns Precision ±90"
Absolute encoder EnDat	
D5	Multiturn optical encoder, 1 Vpp, 512 sinusoid/t, EnDat Protocol, 8192 positions/t , 4096 turn Precision ±60"
B6	Single turn optical encoder, 1 Vpp, 2048 sinusoid/t, EnDat Protocol, 8192 positions/t Precision ±20"
C8	Multiturn optical encoder, 1 Vpp, 2048 sinusoid/t,EnDat Protocol, 8192 positions/t , 4096 turns Precision ±20"
C9	Single turn optical encoder, 1 Vpp, 32 sinusoid/t, EnDat Protocol, 131 072 positions/t Precision ±400"
B9	Multiturn optical encoder, 1 Vpp, 32 sinusoid/t, EnDat Protocol, 131 072 positions/t , 4096 turns Precision ±400"
F2	Multiturn optical encoder, 1 Vpp, 512 sinusoid/t, EnDat Protocol, 8192 positions/t, 4096 turn Precision ±60”
F3	Single turn optical encoder, 1 Vpp, 512 sinusoid/t, EnDat Protocol, 8192 positions/t, 4096 turn Precision ±60”

Options

Code	Option description	Motor sizes					
		SMB 42	**SMH 60**	**SMH 82**	**SMH 100**	**SMH 115**	**SMH 142**
A	Holding brake 24 VDC		√	√	√	√	√
4	Flange B14			√	√		
5	Flange B5	√	√	√	√	√	√
7	Flange B7			√		√	
8	Flange B8		√	√	√	√	
9	Flange B9					√	
S	Smooth shaft	√	√	√	√	√	√
0V	Cables output and flying connectors Faston	√	√				
2IB/2ID	Axial Interconnectron connectors cables output front/back		√	√	√	√	√
2I	Axial Interconnectron connectors rotary cables output					√	√
IP64	Protections	√	√	√	√	√	√
IP65 (optional)		√	√	√	√	√	√
B3/B1/B8/C2	Feedback		√	√			
C6/C7			√	√			
C9/D5/C8/B9/B6			√	√	√	√	√
A6/A7			√	√	√	√	√
F3/F2			√				
A1/A2/A3			√	√	√	√	√
M	Increased inertia (middle inertia)		√	√	√	√	√
230 V	Supply voltage	√	√	√	√	√	√
400 V			√	√	√	√	√

Order Code SMH / SMB

SM...	A	60	30	1,4	5	11	S	2IB	64	F2	M	4
1	2	3	4	5	6	7	8	9	10	11	12	13

1	Motors family	SMH / SMB: Motor with resolver (integrated)
		SME: Encoder feedback (integrated)
2	Brake	A: Holding brake
3	Motor size	42/60/82/100/115/142
4	Nominal speed	[100 min^{-1}] - example 30 = 3000 min^{-1}
5	Stall torque	65K (T_{065}) [Nm] - example 1.4 = 1.4 Nm
6	Flange	4: Flange B14
		5: Flange B5
		7: Flange B7
		8: Flange B8
		9: Flange B9
7	Shaft diameter	6/9/11/14/19/24/28 [mm]
8	Smooth shaft (without key)	S
9	Cables and connectors	0V: Cables output and flying connectors Faston
		2IB/2ID: Axial Interconnectron connectors cables output front/back
		2I: Axial Interconnectron connectors rotary cables output
10	Protections	64: IP64
		65: IP65
11	Feedback	please see page with options
12	Inertia	M: Middle inertia
13	Power supply	2: 230 VAC
		4: 400 VAC

STANDARDS

In compliance with: EN 60034-5, EN 60529, EN 60529/A1.   Marked C E   Marked UL (except SMB 42)

MH / MB

High-Performance Brushless Servo Motors

The MH / MB series caters for torques in the range of 0.2 to 285 Nm, speeds up to 10 000 min^{-1} and includes a total of 75 models available across 6 frame sizes. Thanks to the high quality and performance of the Neodymium-Iron-Boron magnets, and also the encapsulation method used to fasten them to the shaft, the MH / MB series of motors can achieve very high accelerations and withstand high overload without the risk of demagnetisation or detachment of the magnets.

Furthermore, shaft and flange size flexibility on all models provides the user with the possibility to optimise their motor selection for any given application.

Adequate mechanical over-sizing, low inertia in an extra-strong mechanism and a broad range of models permits the application of the MH / MB series in all fields where high dynamic performance and utmost reliability are crucial features.

Typical applications include any type of automatic machinery, especially in the product packaging and handling industry, and wherever the demand exists for axis speed and position synchronisation.

Technical Data from 0.2 to 285 Nm

TECHNICAL SPECIFICATIONS	
Power supply	230 VAC or 400 VAC
Protection	IP64/IP65 optional
Ambient temperature	-10/+40 °C

Available Options

- Flying cables
- Terminal box (power and resolver)
- External encoder
- Increased inertia
- Brake
- Feedback - resolver/incremental/SinCos/absolute encoder full range of motors

- 2-pole resolver feedback
- 4 and 8 poles motor
- NdFeB magnets
- Insulation cabling class F, winding class H
- Bearing lubrificated for life

Motors for 230 VAC power supply

Model	Size	Stall		Nominal			Peak Torque	Inertia		Ke	Kt
		Torque	Current	Torque	Speed	Current		No brake	With brake		
		T_{065} (T_{105}) [Nm]	I_{065} [A]	T_{n065} [Nm]	ω [min^{-1}]	I_{n065} [A]	T_{max} [Nm]	J [kgm^{2}10^{-3}]	J [kgm^{2}10^{-3}]	Ke [Vs]	Kt [Nm/A$_{rms}$]
MH 56 50 0,2...400	56	0.2 (0.40)	0.27	0.21	2500	0.26	1.3	0.011	0.028	0.48	0.83
MH 56 95 0,2...400			0.46	0.19	5000	0.42				0.28	0.48
MH 56 100 0,2...230			0.84	0.15	10000	0.60				0.15	0.26
MH 56 50 0,4...400		0.4 (0.80)	0.49	0.40	2500	0.46	2.5	0.016	0.033	0.52	0.91
MH 56 95 0,4...400			0.84	0.35	5000	0.71				0.30	0.53
MH 56 100 0,4...230			1.52	0.21	10000	0.81				0.17	0.29
MH 56 50 0,6...400		0.6 (1.14)	0.67	0.60	2500	0.63	3.6	0.021	0.038	0.57	0.99
MH 56 95 0,6...400			1.21	0.51	5000	0.98				0.32	0.55
MH 56 100 0,6...230			2.18	0.18	10000	0.71				0.18	0.31
MH 70 37 0,5...400	70	0.5 (0.9)	0.44	0.5	2000	0.43	2.8	0.026	0.055	0.67	1.17
MH 70 70 0,5...400			0.72	0.4	3800	0.66				0.41	0.71
MH 70 75 0,5...230			1.37	0.4	7500	1.00				0.22	0.38
MH 70 37 01...400		1.0 (1.6)	0.84	1.0	2000	0.80	5.1	0.040	0.069	0.72	1.25
MH 70 70 01...400			1.39	0.8	3800	1.23				0.42	0.72
MH 70 75 01...230			2.65	0.5	7500	1.43				0.23	0.39
MH 70 37 1,5...400		1.5 (2.2)	1.23	1.5	2000	1.18	6.8	0.054	0.083	0.73	1.27
MH 70 70 1,5...400			2.25	1.4	3800	1.96				0.42	0.72
MH 70 75 1,5...230			4.07	0.7	7500	1.85				0.23	0.39
MH 70 37 02...400		2.0 (2.7)	1.55	1.9	2000	1.47	8.4	0.068	0..097	0.78	1.36
MH 70 70 02...400			2.82	1.7	3800	2.40				0.43	0.75
MH 70 75 02...230			5.36	0.6	7500	1.74				0.23	0.39
MH 70 37 2,5...400		2.5 (3.1)	1.90	2.4	2000	1.82	9.8	0.081	0.11	0.79	1.36
MH 70 70 2,5...400			3.56	2.1	3800	3.01				0.42	0.73
MH 70 75 2,5...230			6.77	0.6	7500	1.77				0.22	0.38
MH 105 30 02...400	105	2.2 (3.5)	1.5	2.2	1600	1.4	11.0	0.19	0.253	0.9	1.63
MH 105 45 02...400			2.1	2.1	2500	2.0				0.6	1.11
MH 105 60 02...400			2.8	2.1	3000	2.6				0.5	0.83
MH 105 50 02...230			4.3	1.8	5000	3.5				0.3	0.55
MH 105 30 04...400		4.0 (6.1)	2.6	4.0	1600	2.5	19.5	0.34	0.403	1.0	1.65
MH 105 45 04...400			3.8	3.7	2500	3.5				0.7	1.13
MH 105 60 04...400			5.0	3.6	3000	4.4				0.5	0.85
MH 105 50 04...230			7.4	2.7	5000	5.0				0.3	0.58
MH 105 30 06...400		6.0 (8.3)	3.9	5.9	1600	3.7	26.2	0.48	0.543	1.0	1.65
MH 105 45 06...400			5.6	5.5	2500	5.0				0.7	1.15
MH 105 60 06...400			7.4	5.2	3000	6.4				0.5	0.87
MH 105 50 06...230			11.2	3.6	5000	6.7				0.3	0.58
MH 105 30 08...400		8.0 (10.0)	5.2	7.8	1600	5.0	31.7	0.62	0.683	1.0	1.65
MH 105 45 08...400			7.5	7.2	2500	6.6				0.7	1.15
MH 105 60 08...400			9.7	6.8	3000	8.2				0.5	0.88
MH 105 50 08...230			14.2	4.4	5000	7.9				0.4	0.61
MH 145 10 04...400	145	4.5 (9)	1.1	4.6	550	1.1	28	0.78	0.975	2.1	3.65
MH 145 20 04...400			2.3	4.6	1100	2.4				1.2	2.03
MH 145 30 04...400			3.4	4.5	1600	3.3				0.8	1.42
MH 145 45 04...400			4.7	4.3	2500	4.5				0.6	1.01
MH 145 40 04...230			8.1	4.1	4000	7.2				0.4	0.60
MH 145 10 08...400		8.7 (16)	2.0	8.7	550	2.0	49	1.05	1.245	2.7	4.69
MH 145 20 08...400			3.7	8.7	1100	3.6				1.4	2.49
MH 145 30 08...400			5.4	8.6	1600	5.2				1.0	1.70
MH 145 45 08...400			8.2	8.1	2500	7.4				0.7	1.14
MH 145 40 08...230			12.3	7.0	4000	9.7				0.4	0.76

Motors for 230 VAC power supply

Model	Size	Stall		Nominal			Peak Torque	Inertia		Ke	Kt
		Torque	Current	Torque	Speed	Current		No brake	With brake		
		T_{065} (T_{105}) [Nm]	I_{065} [A]	T_{n065} [Nm]	ω [min^{-1}]	I_{n065} [A]	T_{max} [Nm]	J [kgm^{2}10^{-3}]	J [kgm^{2}10^{-3}]	Ke [Vs]	Kt [Nm/A$_{rms}$]
MH 145 10 15...400		15.0 (27)	3.3	15.0	550	3.2	86	1.60	1.795	2.9	4.94
MH 145 20 15...400			6.2	14.7	1100	5.9				1.5	2.59
MH 145 30 15...400			9.1	14.3	1600	8.5				1.0	1.78
MH 145 45 15...400			14.2	13.6	2500	12.5				0.7	1.14
MH 145 40 15...230			21.3	10.9	4000	15.0				0.4	0.76
MH 145 10 22...400		22.0 (37)	4.7	21.9	550	4.6	117	2.15	2.345	2.9	5.03
MH 145 20 22...400			8.9	21.3	1100	8.4				1.5	2.65
MH 145 30 22...400	145		13.1	20.8	1600	12.1				1.0	1.80
MH 145 45 22...400			20.8	19.1	2500	17.6				0.7	1.13
MH 145 40 22...230			31.1	13.4	4000	18.6				0.4	0.76
MH 145 10 28...400		28.0 (45)	5.9	27.8	550	5.8	143	2.70	2.895	2.9	5.07
MH 145 20 28...400			11.3	26.9	1100	10.6				1.5	2.65
MH 145 30 28...400			17.0	26.2	1600	15.5				1.0	1.78
MH 145 45 28...400			26.5	23.2	2500	21.4				0.7	1.13
MH 145 40 28...230			39.6	14.1	4000	19.7				0.4	0.76
MH 205 20 15...400		15 (22)	6.3	14.7	1150	6.2	69	3.5	4.035	1.4	2.38
MH 205 30 15...400			8.6	14.4	1700	8.3				1	1.74
MH 205 10 28...400		28 (39)	6.9	28.6	550	6.9	123	5	5.535	2.5	4.35
MH 205 20 28...400			13.0	28.2	1150	12.7				1.3	2.31
MH 205 30 28...400			20.1	27.6	1700	19.3				0.9	1.50
MH 205 10 50...400		50 (70)	12.4	51.3	550	12.3	222	8	8.535	2.5	4.35
MH 205 20 50...400	205		22.1	50.0	1150	21.3				1.4	2.45
MH 205 30 50...400			33.1	48.0	1700	30.8				0.9	1.63
MH 205 10 70...400		70 (98)	16.8	71.1	550	16.5	310	11	11.535	2.6	4.49
MH 205 20 70...400			30.7	68.6	1150	29.3				1.4	2.45
MH 205 30 70...400			46.1	65.0	1700	41.7				0.9	1.63
MH 205 10 90...400		90 (126)	22.1	90.9	550	21.8	398	14	14.535	2.5	4.35
MH 205 20 90...400			44.3	87.0	1150	41.8				1.3	2.18
MH 205 30 90...400			59	81.7	1700	52.4				0.9	1.63

Motors for 400 VAC power supply

Model	Size	Stall		Nominal			Peak Torque	Inertia		Ke	Kt
		Torque	Current	Torque	Speed	Current		No brake	With brake		
		T_{065} (T_{105}) [Nm]	I_{065} [A]	T_{n065} [Nm]	ω [min^{-1}]	I_{n065} [A]	T_{max} [Nm]	J [kgm^{2}10^{-3}]	J [kgm^{2}10^{-3}]	Ke [Vs]	Kt [Nm/A$_{rms}$]
MH 56 50 0,2...400		0.2 (0.40)	0.27	0.19	5000	0.24	1.3	0.011	0.028	0.48	0.83
MH 56 95 0,2...400			0.46	0.16	9500	0.36				0.28	0.48
MH 56 50 0,4...400	56	0.4 (0.80)	0.49	0.34	5000	0.40	2.5	0.016	0.033	0.52	0.91
MH 56 95 0,4...400			0.84	0.23	9500	0.48				0.30	0.53
MH 56 50 0,6...400		0.6 (1.14)	0.67	0.50	5000	0.54	3.6	0.021	0.038	0.57	0.99
MH 56 95 0,6...400			1.21	0.25	9500	0.51				0.32	0.55
MH 70 37 0,5...400		0.5 (0.9)	0.44	0.5	3700	0.41	2.8	0.026	0.055	0.67	1.17
MH 70 70 0,5...400			0.72	0.4	7000	0.55				0.41	0.71
MH 70 37 01...400		1.0 (1.6)	0.84	0.9	3700	0.74	5.1	0.040	0.069	0.72	1.25
MH 70 70 01...400			1.39	0.6	7000	0.85				0.42	0.72
MH 70 37 1,5...400	70	1.5 (2.2)	1.23	1.3	3700	1.07	6.8	0.054	0.083	0.73	1.27
MH 70 70 1,5...400			2.25	0.8	7000	1.27				0.42	0.72
MH 70 37 2,0...400		2.0 (2.7)	1.55	1.7	3700	1.32	8.4	0.068	0.097	0.78	1.36
MH 70 70 2,0...400			2.82	0.9	7000	1.35				0.43	0.75
MH 70 37 2,5...400		2.5 (3.1)	1.90	2.1	3700	1.60	9.8	0.081	0.11	0.79	1.36
MH 70 70 2,5...400			3.56	1.2	7000	1.73				0.42	0.73

Motors for 400 VAC power supply

Model	Size	Stall		Nominal			Peak Torque	Inertia		Ke	Kt
		Torque	Current	Torque	Speed	Current		No brake	With brake		
		T_{065} (T_{105}) (Nm)	I_{065} (A)	T_{n065} (Nm)	ω (min^{-1})	I_{n065} (A)	T_{max} (Nm)	J (kgm^{2}10^{-3}]	J (kgm^{2}10^{-3}]	Ke (Vs]	Kt (Nm/A$_{rms}$]
MH 105 30 02...400	105	2.2 (3.5)	1.5	2.1	3000	1.4	11.0	0.19	0.253	0.9	1.63
MH 105 45 02...400			2.1	1.9	4500	1.8				0.6	1.11
MH 105 60 02...400			2.8	1.7	6000	2.2				0.5	0.83
MH 105 30 04...400		4.0 (6.1)	2.6	3.6	3000	2.3	19.5	0.34	0.403	1.0	1.65
MH 105 45 04...400			3.8	3.0	4500	2.8				0.7	1.13
MH 105 60 04...400			5.0	2.4	6000	3.0				0.5	0.85
MH 105 30 06...400		6.0 (8.3)	3.9	5.3	3000	3.4	26.2	0.48	0.543	1.0	1.65
MH 105 45 06...400			5.6	4.1	4500	3.8				0.7	1.15
MH 105 60 06...400			7.4	3.0	6000	3.7				0.5	0.87
MH 105 30 08...400		8.0 (10.0)	5.2	6.9	3000	4.4	31.7	0.62	0.683	1.0	1.65
MH 105 45 08...400			7.5	5.2	4500	4.9				0.7	1.15
MH 105 60 08...400			9.7	3.6	6000	4.4				0.5	0.88
MH 145 10 04...400	145	4.5 (9)	1.1	4.5	1000	1.1	28	0.78	0.975	2.1	3.65
MH 145 20 04...400			2.3	4.5	2000	2.3				1.2	2.03
MH 145 30 04...400			3.4	4.3	3000	3.2				0.8	1.42
MH 145 45 04...400			4.7	3.9	4500	4.0				0.6	1.01
MH 145 10 08...400		8.7 (16)	2.0	8.7	1000	1.9	49	1.05	1.245	2.7	4.69
MH 145 20 08...400			3.7	8.4	2000	3.5				1.4	2.49
MH 145 30 08...400			5.4	7.9	3000	4.8				1.0	1.70
MH 145 45 08...400			8.2	7.1	4500	6.6				0.7	1.14
MH 145 10 15...400		15.0 (27)	3.3	14.8	1000	3.1	86	1.60	1.795	2.9	4.94
MH 145 20 15...400			6.2	13.7	2000	5.5				1.5	2.59
MH 145 30 15...400			9.1	12.7	3000	7.5				1.0	1.78
MH 145 45 15...400			14.2	9.8	4500	9.1				0.7	1.14
MH 145 10 22...400		22.0 (37)	4.7	21.4	1000	4.5	117	2.15	2.345	2.9	5.03
MH 145 20 22...400			8.9	19.4	2000	7.6				1.5	2.65
MH 145 30 22...400			13.1	17.3	3000	10.1				1.0	1.80
MH 145 45 22...400			20.8	11.6	4500	10.8				0.7	1.13
MH 145 10 28...400		28.0 (45)	5.9	27.1	1000	5.6	143	2.70	2.895	2.9	5.07
MH 145 20 28...400			11.3	23.9	2000	9.4				1.5	2.65
MH 145 30 28...400			17.0	21.1	3000	12.5				1.0	1.78
MH 145 45 28...400			26.5	10.0	4500	9.4				0.7	1.13
MH 205 20 15...400	205	15 (22)	6.3	14.1	2000	5.9	69	3.5	4.035	1.4	2.38
MH 205 30 15...400			8.6	13.4	3000	7.7				1	1.74
MH 205 10 28...400		28 (39)	6.9	28.2	1000	6.8	123	5	5.535	2.5	4.35
MH 205 20 28...400			13.0	27.3	2000	12.3				1.3	2.31
MH 205 30 28...400			20.1	25.7	3000	18.0				0.9	1.50
MH 205 10 50...400		50 (70)	12.4	50.4	1000	12.1	222	8	8.535	2.5	4.35
MH 205 20 50...400			22.1	47.0	2000	20.1				1.4	2.45
MH 205 30 50...400			33.1	41.7	3000	26.8				0.9	1.63
MH 205 10 70...400		70 (98)	16.8	69.4	1000	16.1	310	11	11.535	2.6	4.49
MH 205 20 70...400			30.7	62.9	2000	26.9				1.4	2.45
MH 205 30 70...400			46.1	52.3	3000	33.7				0.9	1.63
MH 205 10 90...400		90 (126)	22.1	88.2	1000	21.2	398	14	14.535	2.5	4.35
MH 205 20 90...400			44.3	78.3	2000	37.7				1.3	2.18
MH 205 30 90...400			59.0	61.6	3000	39.7				0.9	1.63
MB 265 10 75...400	265	75 (95)	14.6	75	1000	14.1	240	22		3.1	5.3
MB 265 20 75...400			28.5	67	2000	25.1				1.5	2.7
MB 265 30 75...400			43.3	57	3000	32.2				1.0	1.8
MB 265 10 150...400		150 (190)	28.5	144	1000	26.9	480	36		3.1	5.3
MB 265 20 150...400			64.6	127	2000	53.7				1.4	2.4
MB 265 30 150...400			86.0	94	3000	53.0				1.0	1.8
MB 265 10 220...400		220 (280)	41.5	208	1000	39.0	695	49		3.1	5.3
MB 265 20 220...400			82.8	176	2000	65.8				1.5	2.7
MB 265 30 220...400			123.6	114	3000	63.9				1.0	1.8
MB 265 10 285...400		285 (360)	48.2	266	1000	44.9	900	63		3.4	5.9
MB 265 20 285...400			120.7	220	2000	92.9				1.4	2.4

Curves

MH 56

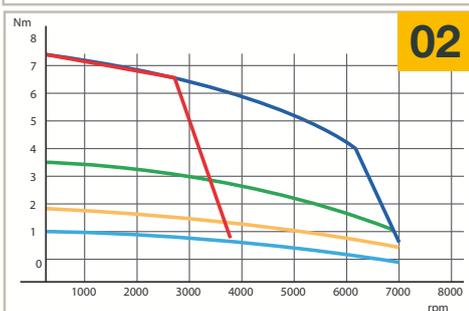**5000rpm 230V   9500rpm 400V**

0,2

0,4

0,6
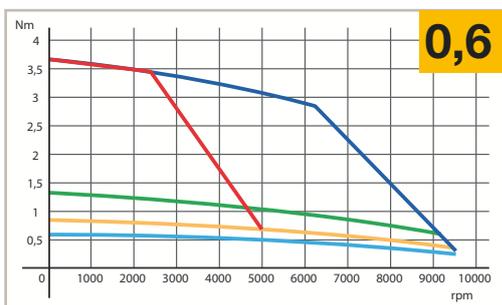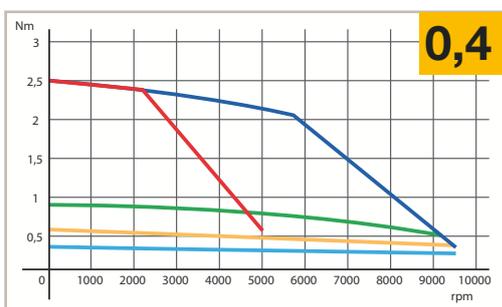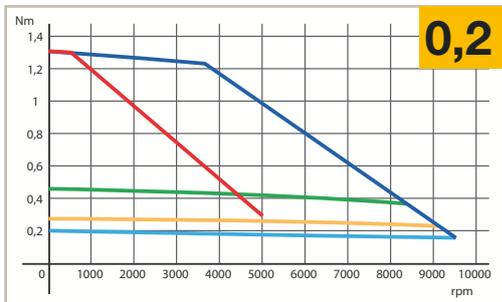
- ▬ S1 65K ΔT
- ▬ S3 50% 5min
- ▬ S3 20% 5min
- ▬ S3 10% 5min 230V
- ▬ S3 10% 5min 400V

MH 70

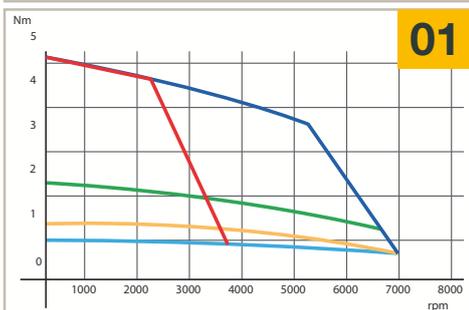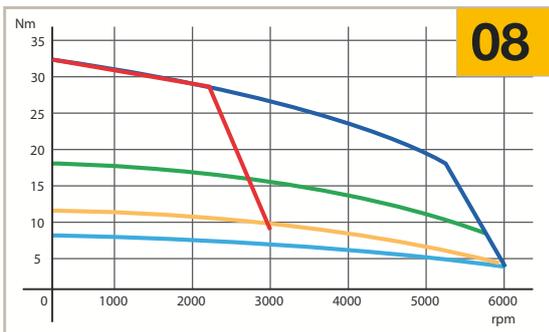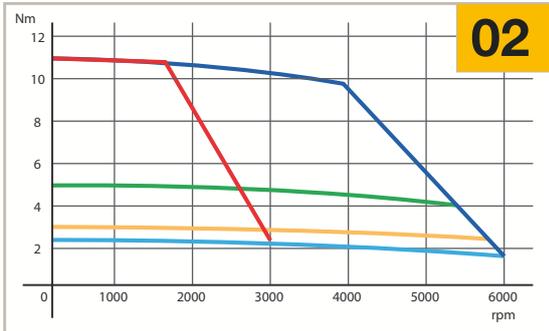**3800 rpm 230V   7000 rpm 400V**

0,5

01

1,5

02

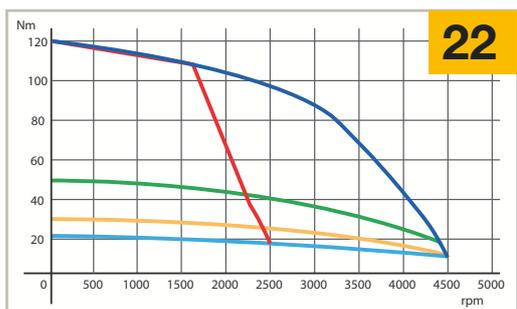**2,5**
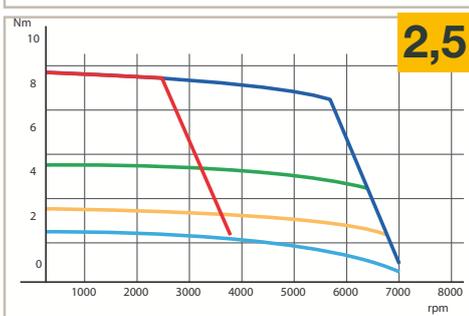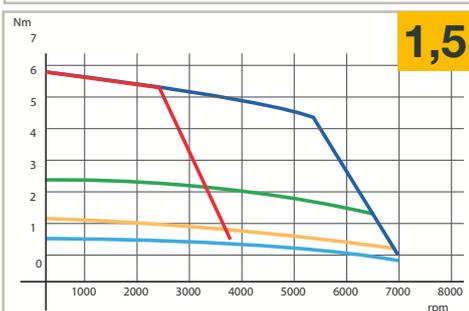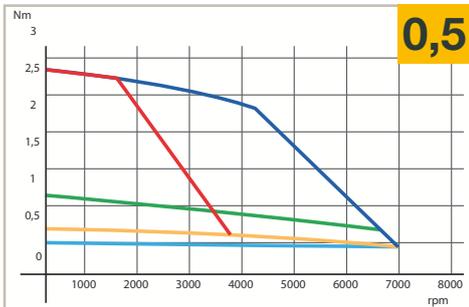
- ▬ S1 65K ΔT
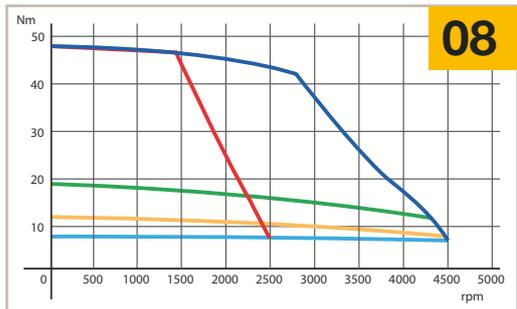- ▬ S3 50% 5min
- ▬ S3 20% 5min
- ▬ S3 10% 5min 230V
- ▬ S3 10% 5min 400V

MH 105

3000 rpm 230V 6000 rpm 400V

02

04

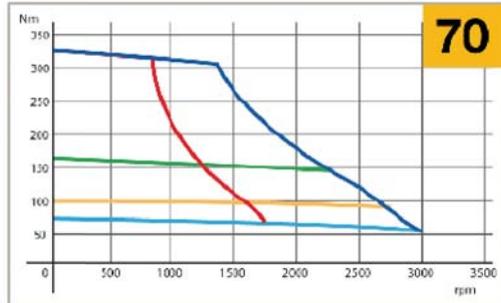
06

08
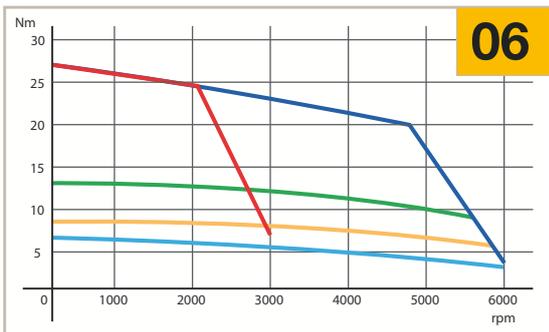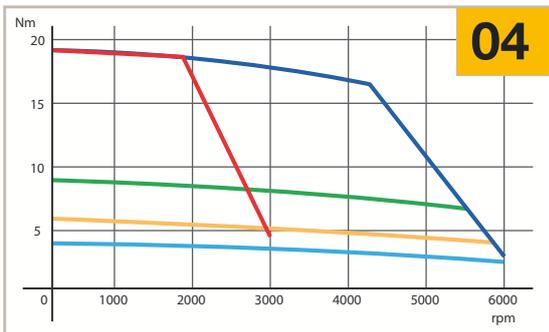
- S1 65K ΔT
- S3 50% 5min
- S3 20% 5min
- S3 10% 5min 230V
- S3 10% 5min 400V

MH 145

2500 rpm 230V 4500 rpm 400V

04

08

15

22

28
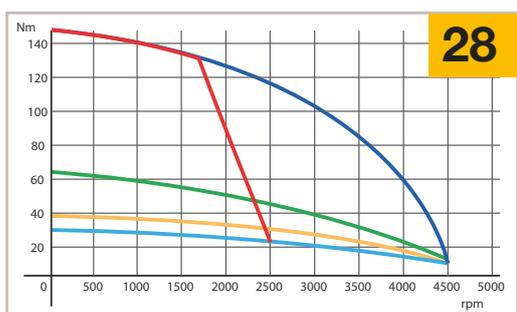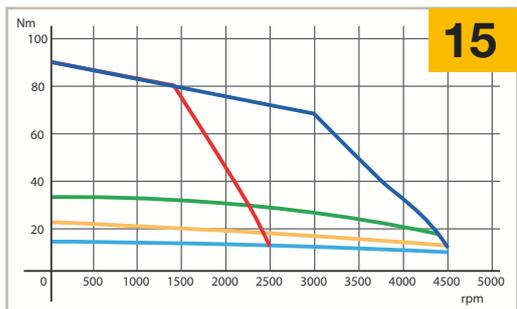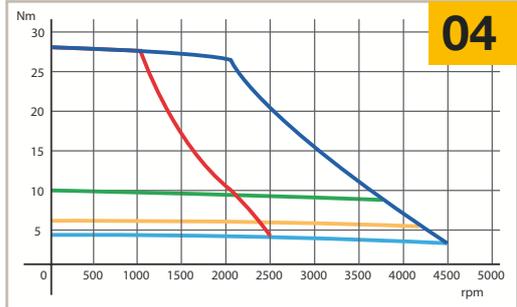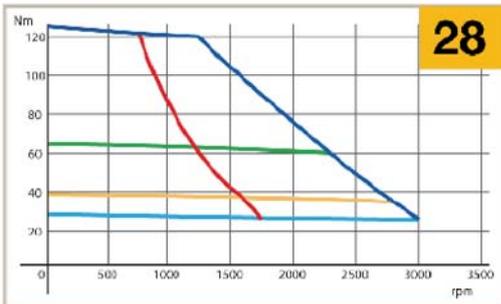
- S1 65K ΔT
- S3 50% 5min
- S3 20% 5min
- S3 10% 5min 230V
- S3 10% 5min 400V

MH 205

1700 rpm 230V 3000 rpm 400V

Graph **15** — Nm (0–70) vs rpm (0–3500)

Graph **28** — Nm (0–120) vs rpm (0–3500)

Graph **50** — Nm (0–250) vs rpm (0–3500)

Graph **70** — Nm (0–350) vs rpm (0–3500)

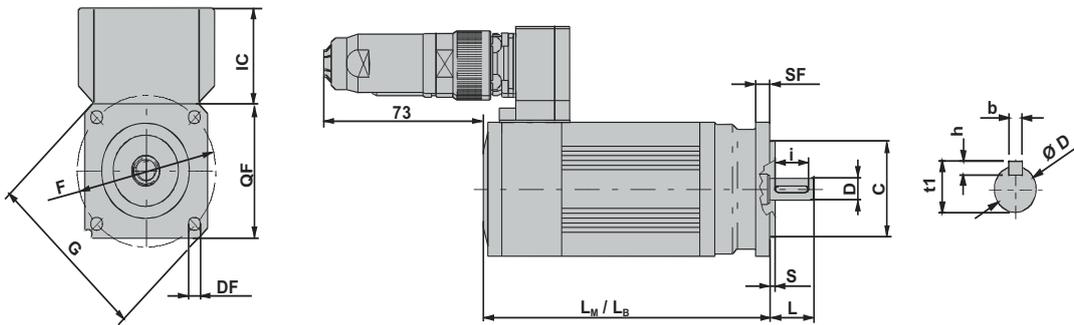Graph **90** — Nm (0–400) vs rpm (0–3500)
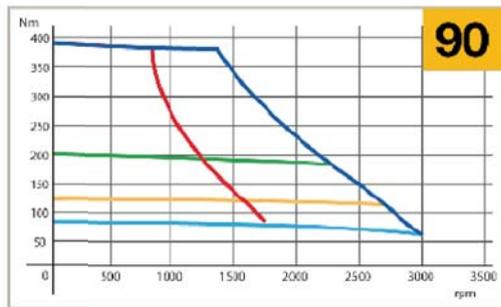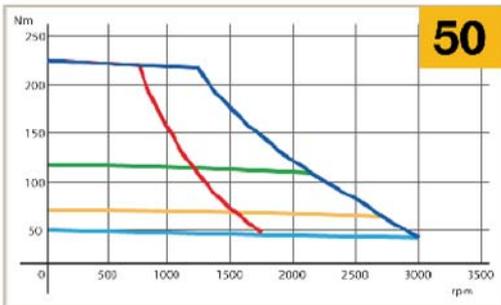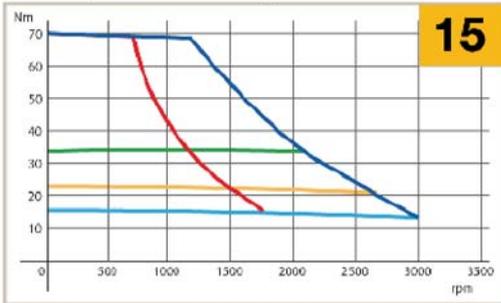
Legend:
- S1 65K ΔT
- S3 50% 5min
- S3 20% 5min
- S3 10% 5min 230V
- S3 10% 5min 400V

MB 265

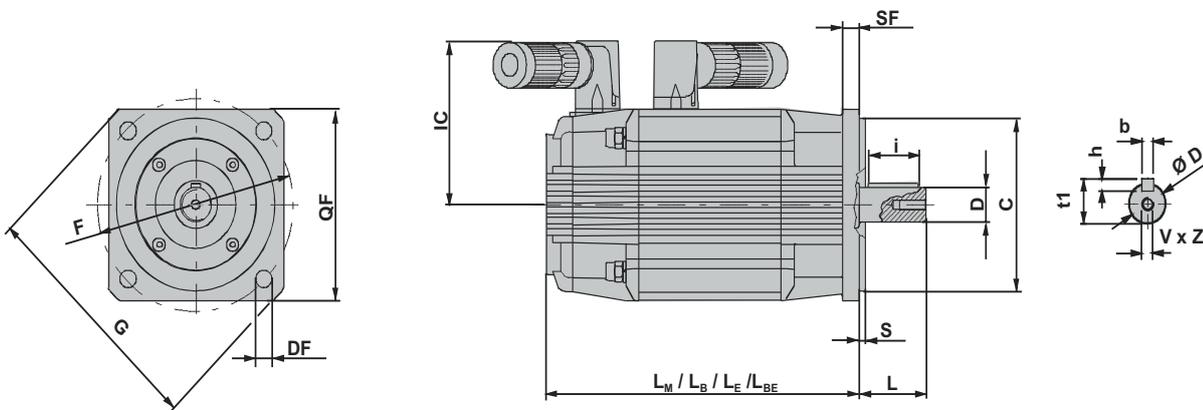**For MB 265 curves, please get in touch with our Technical Department**
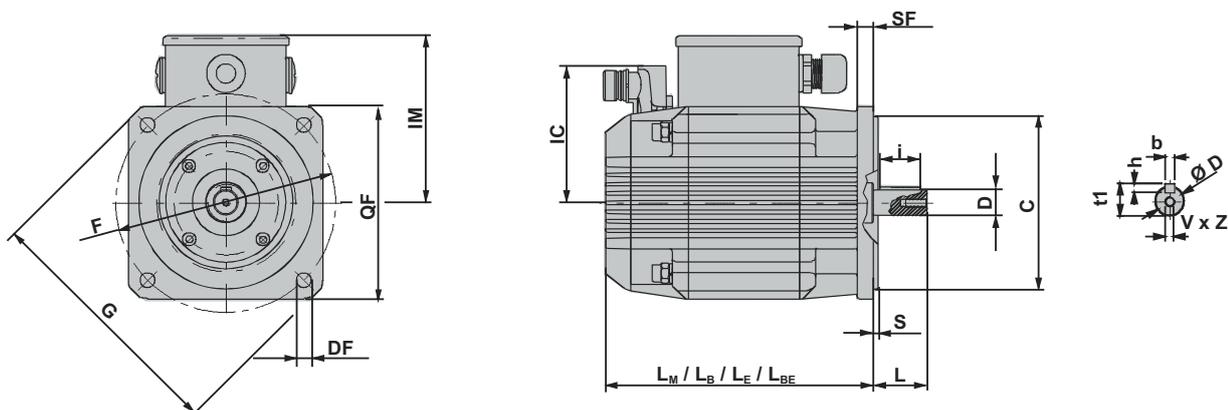
Dimensions and Weight

MH 56

Lenght	Brake	Feedback
LM	no	Resolver
LB	yes	Resolver
LE	no	SinCos
LBE	yes	SinCos

MH 70 & MH 105

MH 145 & 205

Servo motor	Type	LM / LB / LE / LBE	SF	IC	Flange	DF	F	D x L	b x h x i	t1	V x Z	QF	C x S		G	Weight
MH 56	0.2	130.5 / 181.5	6.5	40	5	5.5	63	9 x 20	3 x 3 x 16	10.2	--	56	Ø40	h6 x 2.5	74	0.7
	0.4	150.5 / 201.5						11 x 23	4 x 4 x 18	12.5						1.0
	0.6	170.5 / 221.5														1.3
MH 70	0.5	158 / 214 / --- / ---	8.5	85	5	6	75	11 x 23	4 x 4 x 18	12,5	M4 x 10	70	Ø60	h6 x 2.5	90	2.0
	01	188 / 244 / --- / ---						14 x 30	5 x 5 x 25	16.0	M5 x 12.5					2.8
	1.5	218 / 274 / --- / ---														3.5
	02	248 / 304 / --- / ---														4.3
MH 105 Flange B5 / 14	02	186 / 250 / 206 / 260	10	90	5 14	9,5 M8	115	19 x 40	6 x 6 x 30	21.5	M6 x 16	105	Ø95	h6 x 3.5	140	5.0
	04 (02ML)	229 / 293 / 250 / 304						24 x 50	8 x 7 x 40	27,0	M8 x 19					7.0
	06 (04 ML)	273 / 337 / 294 / 348														9.0
	08 (06 ML)	317 / 381 / 338 / 392														11.00
MH 105 Flange B6 / 9	02	186 / 250 / 206 / 260	10	90	6 9	9 7	130 100	19 x 40	6 x 6 x 30	21.5	M6 x 16	116 96	Ø110 Ø80	h6 x 3.5 h6 x 3.5	155 128	5.0
	04 (02ML)	229 / 293 / 250 / 304						24 x 50	8 x 7 x 40	27.0	M8 x 19					7.0
	06 (04 ML)	273 / 337 / 294 / 348														9.0
	08 (06 ML)	317 / 381 / 338 / 392														11.00

Servo motor	Type	LM / LB / LE / LBE	SF	IM	IC	Flange	DF	F	D x L	b x h x i	t1	V x Z	QF	C x S		G	Weight
MH 145	04	200 / 274 / 220 / 294	12	125	103	5 14	11.5 M10	165	24 x 50	8 x 7 x 40	27	M8 x 19	145	Ø130	h6 x 3.5	200	8.0
	08 (04 ML)	231 / 305 / 251 / 325							28 x 60	8 x 7 x 50	31	M10 x 22					12.0
	15 (08 ML)	292 / 366 / 312 / 396															18.0
	22 (15 ML)	354 / 428 / 374 / 448															23.0
	28 (22 ML)	416 / 490 / 436 / 510															28.0
MH 205	28	273 / 372 / 293* / 392	18	172	132	5	14	215	38 x 80	10 x 8 x 70	41	M12 x 32	205	Ø180	h6 x 4	250	29.0
	50 (28 ML)	342 / 441 / 362* / 461*							42 x 110	12 x 8 x 100	45	M16 x 40					44.0
	70 (50 ML)	411 / 510 / 431* / 530*															59.0
	90 (70 ML)	480 / 579 / 500* / 599*															74.0

mm for dimensions, kg for weight
*applies only to SinCos Multiturn (Option A7), Option A6 (SinCos Singleturn) has no effect on the motor length.
For MB 265 dimensions please get in touch with our Technical Department

Feedback Details

Code	Description
	Incremental encoder
A1	Incremental encoder 2000 i/t, 8 poles Precision ±32", Differential Line Driver 20 mA
A2	Incremental encoder 2048 i/t, 8 poles Precision ±32", Differential Line Driver 20 mA
A3	Incremental encoder 4096 i/t, 8 poles Precision ±16", Differential Line Driver 20 mA
B1	Incremental encoder 3000 i/t, 4 poles Precision ±22", Differential Line Driver 20 mA
B3	Incremental encoder 2048 i/t, 8 poles Precision ±32", Differential Line Driver 20 mA
B8	Incremental encoder 3000 i/t, 8 poles Precision ±22", Differential Line Driver 20 mA
C2	Incremental encoder 2048 i/t, 4 poles Precision ±32", Differential Line Driver 20 mA
	Absolute encoder Hiperface
C6	Single turn optical encoder, 1 Vpp, 128 sinusoid/t, Hiperface Protocol, 4096 positions/g Precision ±320"
C7	Single turn optical encoder, 1 Vpp, 128 sinusoid/t, Hiperface Protocol, 4096 positions/g, 4096 turns Precision ±320"
A6	Single turn optical encoder, 1 Vpp, 1024 sinusoid/t, Hiperface Protocol, 32 768 positions/g Precision ±90"
A7	Single turn optical encoder, 1 Vpp, 1024 sinusoid/t, Hiperface Protocol, 32 768 positions/g, 4096 turns Precision ±90"
	Absolute encoder EnDat
D5	Multiturn optical encoder, 1 Vpp, 512 sinusoid/t, EnDat Protocol, 8192 positions/t , 4096 turn Precision ±60"
B6	Single turn optical encoder, 1 Vpp, 2048 sinusoid/t, EnDat Protocol, 8192 positions/t Precision ±20"
C8	Multiturn optical encoder, 1 Vpp, 2048 sinusoid/t,EnDat Protocol, 8192 positions/t , 4096 turns Precision ±20"
C9	Single turn optical encoder, 1 Vpp, 32 sinusoid/t, EnDat Protocol, 131 072 positions/t Precision ±400"
B9	Multiturn optical encoder, 1 Vpp, 32 sinusoid/t, EnDat Protocol, 131 072 positions/t , 4096 turns Precision ±400"
F2	Multiturn optical encoder, 1 Vpp, 512 sinusoid/t, EnDat Protocol, 8192 positions/t, 4096 turn Precision ±60”
F3	Single turn optical encoder, 1 Vpp, 512 sinusoid/t, EnDat Protocol, 8192 positions/t, 4096 turn Precision ±60”

Options

Code	Option description	Motor sizes					
		MH 56	MH 70	MH 105	MH 145	MH 205	MB 265
X	Increased Safety ATEX II 2G EEx and II T3 explosion proof in compliance with EN 60079-0 - EN 60079-7 - Directive 94/9/CE **			√	√		
A	Holding brake 24 VDC	√	√	√	√	√	√
V	Cooling - selfventilation			√	√	√	
SV	Cooling - servoventilation			√	√	√	
W	Cooling - water				√		
4	Flange B14			√	√		
5	Flange B5	√	√	√	√	√	√
6	Flange B6			√			
9	Flange B9			√			
S	Smooth shaft	√	√	√	√	√	√
2IB/2ID	Axial Interconnectron connectors Cables output front/back	√					
2I	Axial Interconnectron connectors Rotary cables output		√	√			
3I	Terminal box motor cables & Interconnectron connector feedback cable				√	√	
3	Form B3			√	√	√	
IP64	Protections	√	√	√	√	√	√
IP65 (optional)		√	√	√	√	√	√
B3/B1/B8/C2	Feedback		√	√			n.a.
C6/C7			√				n.a.
C9/D5/C8/B9/B6				√	√	√	n.a.
A6/A7			√	√	√	√	n.a.
F3/F2			√				n.a.
A1/A2/A3				√	√	√	n.a.
M/ML	Increased inertia (middle inertia/high inertia)						
230 V	Supply voltage	√	√	√	√	√	
400 V		√	√	√	√	√	√

** The certification is valid only if the motors are driven by HPD H3, with nominal currents from 2 to 16 A_{rms} and supply voltage 400 V and motor derating

Order Code MH / MB

M...	X	A	V	56	40	08	4	9	S	2ID	3	64	A1	M	2
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

1	Motors family	MH / MB: Motor with resolver (integrated)
		ME: Encoder feedback (integrated)
2	Atex	X: Increased Safety ATEX II 2G EEx and II T3
3	Brake	A: Holding brake
		AM: Holding brake with increased braking
4	Ventilation	V: Selfventilation
		SV: Servoventilation
		W: Water cooling
5	Motor size	56/70/105/145/205/265
6	Nominal speed	[100 min^{-1}] - example 40 = 4000 min^{-1}
7	Stall torque	65K (T_{065}) [Nm] - example 08 = 8 Nm
8	Flange	4: Flange B14
		5: Flange B5
		6: Flange B6
		9: Flange B9
9	Shaft diameter	9/11/14/19/24/38 [mm]
10	Smooth shaft (without key)	S
11	Connectors	2IB/2ID: Axial Interconnectron connectors cables output front/back
		2I: Axial Interconnectron connectors rotary cables output
		3I: Terminal box & Interconnectron connector
12	Form	3: Form B3
13	Protections	64: IP64
		65: IP65
14	Feedback	please see page with options
15	Inertia	M: Middle inertia
		ML: High inertia
16	Voltage supply	2: 230 V
		4: 400 V

STANDARDS

In compliance with: EN 60034-5, EN 60529, EN 60529/A1   Marked C E

Additional information available on:

www.parker-eme.com/smh

www.parker-eme.com/smb

www.parker-eme.com/mh

www.parker-eme.com/mb