Servo motors EMMB-AS

Key features

Everything from a single source

Motors EMMB-AS → Page 4

- Brushless, permanently excited synchronous servo motors
- Reliable, dynamic, precise
- Digital absolute displacement encoder with single turn, multi-turn optional
- Optimised connection technology
- Winding variants
  - For single-phase motor controller
  - Optimised for rotational speed
- Holding brake

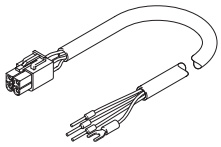
Gear unit EMGA-EAS/-SAS → Page 10

- Low-backlash planetary gear
- Gear ratio i = 3 and 5, available from stock
- Life-time lubrication
- Degree of protection: IP54
- Other gear unit types, ratios, designs and versions on request

Servo drive CMMT-AS → Internet: cmm

- Universal servo drive for synchronous servo motors
- Integrated EMC filters
- Integrated brake chopper
- Integrated braking resistor
- Integrated safety functions
- Position controller
- Speed controller
- Force controller
- Range of control functions
- Interfaces:
  - EtherCAT
  - PROFINET

Motor, encoder and connecting cables NEBM → Page 11



- Suitable for energy chains
- Connection technology on motor side with degree of protection to IP20
- Can be used in a wide temperature range

Axial and parallel kits EAMM → Internet: eamm

- Specific kits for all electromechanical axes from Festo
- Each kit includes the relevant necessary coupling housing, couplings and motor flange as well as all screws
- Optionally with degree of protection IP65

Type codes

001	Series	
EMMB	Motor	

002	Motor type	
AS	AC synchronous	

003	Flange size, motors	
40	40	
60	60	
80	80	

004	Performance class	
01	100 W	
02	200 W	
04	400 W	
07	750 W	

005	Output shaft	
	Smooth shaft	
K	Shaft to DIN 6885	

006	Electrical connection	
S	Straight plug	

007	Cable length [cm]	
30	30 cm	

008	Measuring unit	
S	Absolute encoder, single turn	
M	Absolute encoder, multi-turn	

009	Brake	
	None	
B	With brake	

NEW

Data sheet

Note

Motors and motor controllers from Festo have been specially designed to be used together. Trouble-free operation cannot be guaranteed in combination with third-party controllers.

Technical data					
Flange size		40	60		80
Performance class		01	02	04	07
Motor					
Nominal voltage	[V DC]	300	300	300	300
Nominal current	[A]	1.3	1.4	2.4	3.8
Continuous stall current	[A]	1.43	1.5	2.6	4.2
Peak current	[A]	3.9	4.2	7.2	11.4
Nominal power	[W]	100	200	400	750
Nominal torque	[Nm]	0.32	0.64	1.27	2.39
Peak torque	[Nm]	0.96	1.92	3.81	7.17
Stall torque	[Nm]	0.352	0.7	1.4	2.63
Nominal rotary speed	[rpm]	3000	3000	3000	3000
Max. rotational speed	[rpm]	6000	6000	6000	5000
Motor constant	[Nm/A]	0.265	0.48	0.562	0.662
Voltage constant (phase-to-phase)	[mVmin]	16.2	29	34	40
Number of pole pairs		5	3	3	3
Winding resistance	[Ω]	7.9	11.2	5.8	2.1
Winding inductance	[mH]	10.5	20.9	11.5	10.5
Total output moment of inertia					
Without brake	[kgcm²]	0.059	0.214	0.405	0.942
With brake	[kgcm²]	0.063	0.234	0.425	0.978
Shaft load at nominal rotary speed					
Radial	[N]	120	180	180	335
Axial	[N]	60	90	90	167.5
Brake					
Operating voltage	[V DC]	24	24	24	24
Power	[W]	5.9	7.2	7.2	11.5
Holding torque	[Nm]	0.32	1.3	1.3	3.2
Mass moment of inertia	[kgcm²]	0.004	0.004	0.004	0.012

Weights [kg]				
Flange size	40	60		80
Performance class	01	02	04	07
Without brake	0.8	1.1	1.6	2.8
With brake	1	1.6	2.1	3.5

Data sheet

Technical data – Encoder			
Measuring unit		Absolute, single turn	Absolute, multi-turn
Interface/protocol		Nikon A format	
Operating voltage	[V DC]	5 (±5%)	
Operating voltage range	[V DC]	4.75 ... 5.25	
Measuring principle		Optical	
Position values per revolution		1048576	
Resolution	[bit]	20	
Absolute detectable revolutions		1	65536, 16 bits
System accuracy of angle measurement	[arcsec]	±120	

Operating and environmental conditions				
Flange size		40	60	80
Conforms to standard		IEC60034		
Degree of protection				
Motor shaft (without rotary shaft seal)		IP40		
Motor shaft (with rotary shaft seal)[1]		IP54		
Motor housing (without connection technology)		IP65		
Ambient temperature	[°C]	–15 ... +40		
Note on ambient temperature		Up to 60 °C with derating of –1.5% per degree Celsius		
Storage temperature	[°C]	–20 ... +55		
Max. setup altitude	[m]	4000		
Note on max. setup altitude		As of 1000 m only with derating of –1.0% per 100 m		
Insulation class		F (up to 155 °C)		
Temperature monitoring		Digital motor temperature transmission via Nikon A format		
Rating class to EN 60034-1		S1 (continuous operation)		
Relative humidity	[%]	0 ... 90 (non-condensing)		
Vibration resistance		Transport application test with severity level 2 to FN 942017-4 and EN 60068-2-6		
Shock resistance		Shock test with severity level 2 to FN 942017-5 and EN 60068-2-27		
CE marking (see declaration of conformity)		To EU Low Voltage Directive		
		To EU-EMC Directive[2]		
		To EU RoHS Directive		
UKCA marking (see declaration of conformity)		To UK instructions for EMC		
		To UK RoHS instructions		
		To UK regulations for electrical equipment		
Certification		c UL us - Recognized (OL)		
Note on materials		RoHS-compliant		
		Contains paint-wetting impairment substances		

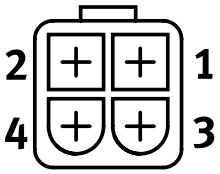
1) The rotary shaft seal is included in the scope of delivery of the motor.

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp ➔ Certificates.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Data sheet

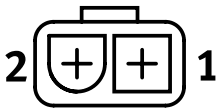
Pin allocation – Motor side

Motor



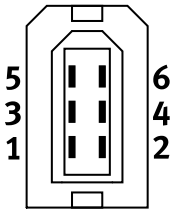
PIN	Function	
1	U	Phase
2	V	Phase
3	W	Phase
4	PE	Protective earthing

Brake



PIN	Function
1	BR+
2	BR–

Encoder

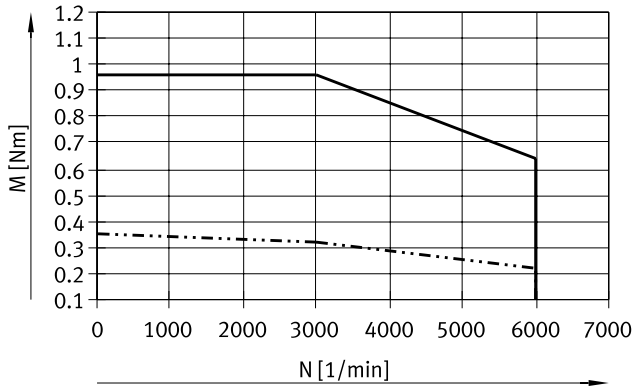


PIN	Function
1	Vcc
2	GND
3	BAT+
4	BAT–
5	SD+
6	SD–

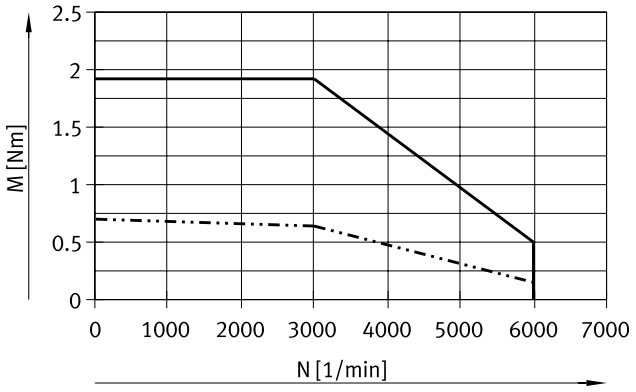
Data sheet

Torque M as a function of rotational speed n

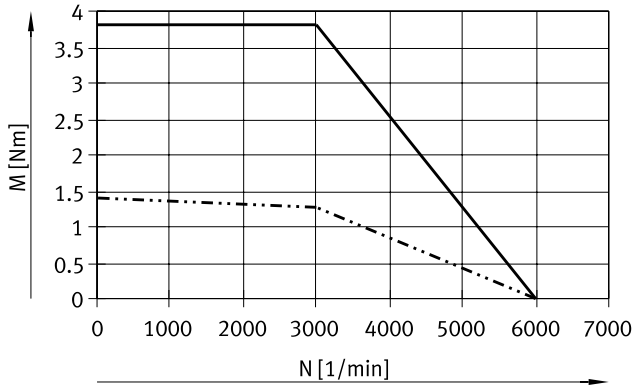
Flange size 40
Performance class 01



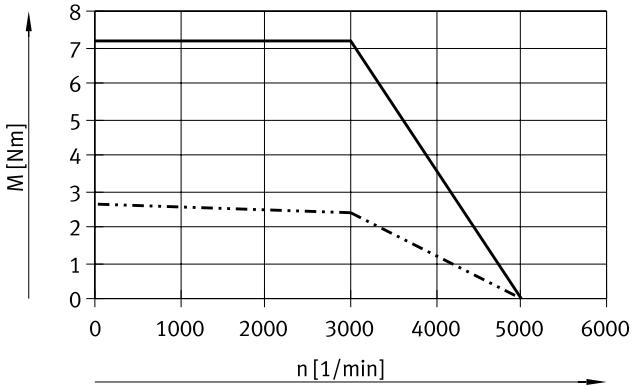
Flange size 60
Performance class 02



Flange size 60
Performance class 04



Flange size 80
Performance class 07



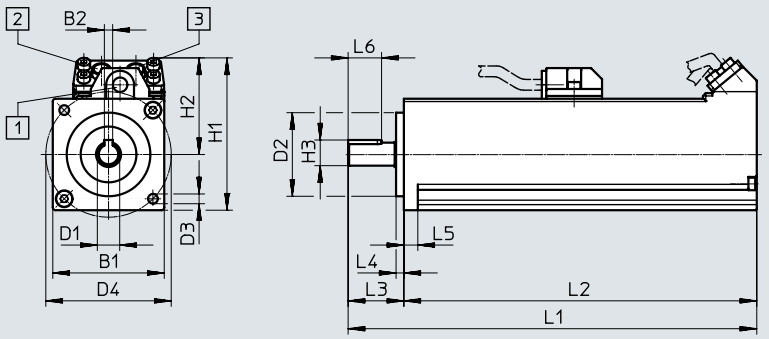
Peak torque
Nominal torque

Note
Typical motor characteristic curve with nominal voltage and optimal motor controller.

Data sheet

Dimensions Download CAD data ➔ www.festo.com

EMMB-AS-40



[1] Electrical connection for motor
[2] Electrical connection for brake
[3] Electrical connection for encoder

Type	Featherkey	B1	B2 −0.014	D1 ø −0.013	D2 ø −0.021	D3 ø	D4 ø ±0.2
EMMB-AS-40	Without	40	–	8	30	3.5	45
	With		3				

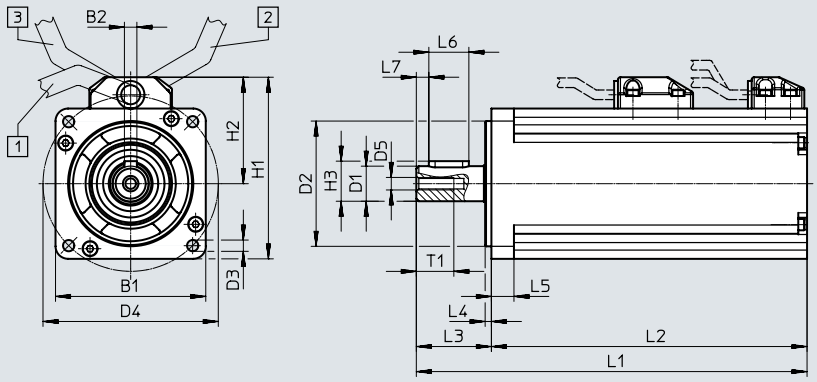
Type	Featherkey	H1 max.	H2 max.	H3	L1		L2	
					Without brake +1.5/−1.7	With brake +1.5/−1.7	Without brake ±1	With brake ±1
EMMB-AS-40	Without	70	50	–	116.6	146.6	96.6	126.6
	With			9.7				

Type	Featherkey	L3 +0.5/−0.7	L4	L5	L6
EMMB-AS-40	Without	20	2.8	5	–
	With				12

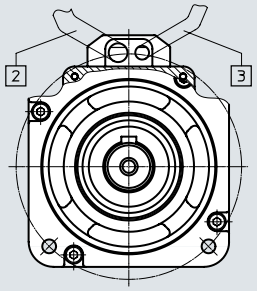
Data sheet

Dimensions Download CAD data ➔ www.festo.com

EMMB-AS-60/-80



EMMB-AS-80



[1] Electrical connection for motor
[2] Electrical connection for encoder
[3] Electrical connection for brake

Type	Featherkey	B1	B2	D1 Ø	D2 Ø	D3 Ø	D4 Ø ±0.1	D5 Ø
EMMB-AS-60-02	Without	60	–	$14_{-0.011}$	$50_{-0.016}$	4.5	70	5
	With		5					
EMMB-AS-60-04	Without	60	–	$14_{-0.011}$	$50_{-0.016}$	4.5	70	5
	With		5					
EMMB-AS-80-07	Without	80	–	$19_{-0.013}$	$70_{-0.02}$	5.5	90	6
	With		6					

Type	Featherkey	H1	H2	H3 –0.13	L1		L2	
					Without brake	With brake	Without brake ±1.5	With brake ±1.5
EMMB-AS-60-02	Without	72.5	42.5	16	$124_{\pm 2.5}$	$156_{\pm 2.5}$	94	126
	With							
EMMB-AS-60-04	Without	72.5	42.5	16	$150_{\pm 2.5}$	$182_{\pm 2.5}$	120	152
	With							
EMMB-AS-80-07	Without	94	54	21.5	$164_{+2.4/-2}$	$193.5_{+2.4/-2}$	129.5	159
	With							

Type	Featherkey	L3	L4	L5 ±1	L6	L7	T1
EMMB-AS-60-02	Without	$30_{\pm 1}$	2.5	9	–	–	15
	With				16	5	
EMMB-AS-60-04	Without	$30_{\pm 1}$	2.5	9	–	–	15
	With				16	5	
EMMB-AS-80-07	Without	$34.5_{+0.9/-0.5}$	3	10	–	–	15
	With				22	4	

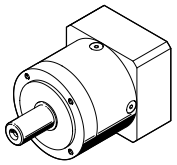
Data sheet

Ordering data

Nominal power [W]				Measuring unit		Variant		Part no.	Type
100	200	400	750	Encoder, single turn	Encoder, multi-turn	With featherkey	With brake		
Flange size 40									
■				■				8097163	EMMB-AS-40-01-S30S
■				■			■	8097164	EMMB-AS-40-01-S30SB
■				■		■		8097165	EMMB-AS-40-01-K-S30S
■				■		■	■	8097166	EMMB-AS-40-01-K-S30SB
■					■			8097167	EMMB-AS-40-01-S30M
■					■		■	8097168	EMMB-AS-40-01-S30MB
■					■	■		8097169	EMMB-AS-40-01-K-S30M
■					■	■	■	8097170	EMMB-AS-40-01-K-S30MB
Flange size 60									
	■			■				8097171	EMMB-AS-60-02-S30S
	■			■			■	8097172	EMMB-AS-60-02-S30SB
	■			■		■		8097173	EMMB-AS-60-02-K-S30S
	■			■		■	■	8097174	EMMB-AS-60-02-K-S30SB
	■				■			8097175	EMMB-AS-60-02-S30M
	■				■		■	8097176	EMMB-AS-60-02-S30MB
	■				■	■		8097177	EMMB-AS-60-02-K-S30M
	■				■	■	■	8097178	EMMB-AS-60-02-K-S30MB
		■		■				8097179	EMMB-AS-60-04-S30S
		■		■			■	8097180	EMMB-AS-60-04-S30SB
		■		■		■		8097181	EMMB-AS-60-04-K-S30S
		■		■		■	■	8097182	EMMB-AS-60-04-K-S30SB
		■			■			8097183	EMMB-AS-60-04-S30M
		■			■		■	8097184	EMMB-AS-60-04-S30MB
		■			■	■		8097185	EMMB-AS-60-04-K-S30M
		■			■	■	■	8097186	EMMB-AS-60-04-K-S30MB
Flange size 80									
			■	■				8097187	EMMB-AS-80-07-S30S
			■	■			■	8097188	EMMB-AS-80-07-S30SB
			■	■		■		8097189	EMMB-AS-80-07-K-S30S
			■	■		■	■	8097190	EMMB-AS-80-07-K-S30SB
			■		■			8097191	EMMB-AS-80-07-S30M
			■		■		■	8097192	EMMB-AS-80-07-S30MB
			■		■	■		8097193	EMMB-AS-80-07-K-S30M
			■		■	■	■	8097194	EMMB-AS-80-07-K-S30MB

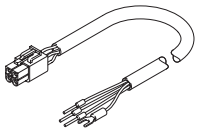
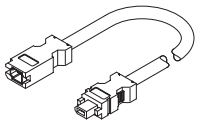
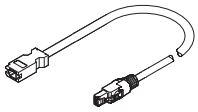
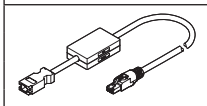
Accessories

Ordering data – Gear unit

	For motor flange size	Gear ratio	Part no.	Type
	40P	3	2297684	EMGA-40-P-G3-EAS-40
		5	2297685	EMGA-40-P-G5-EAS-40
	60P	3	2297686	EMGA-60-P-G3-EAS-60
		5	2297687	EMGA-60-P-G5-EAS-60
	80P	3	2297690	EMGA-80-P-G3-EAS-80
		5	2297691	EMGA-80-P-G5-EAS-80

Accessories

Technical data – Cables			
Designation		Motor cable	Encoder cable
Type		NEBM-H6G4-E-...	NEBM-REG6-E-...
Cable composition		4x 0.79 mm²	2x 0.51 mm² + 4x 0.205 mm²
Cable diameter	[mm]	7.3	7.4
Pollution degree		3	3
Bending radius			
Fixed cable installation	[mm]	≥ 55	≥ 55
Flexible cable installation	[mm]	≥ 55	≥ 55
Ambient temperature			
Standard	[°C]	–25 ... +90	–40 ... +80
Flexible cable installation	[°C]	–25 ... +90	–10 ... +80
Cable characteristic		Suitable for energy chains	Suitable for energy chains
Degree of protection		IP20 (in mounted state)	IP20 (in mounted state)
CE marking (see declaration of conformity)		To EU Low Voltage Directive	To EU Low Voltage Directive
Material		PVC	PVC
Note on materials		RoHS-compliant	RoHS-compliant
		Contains paint-wetting impairment substances	Contains paint-wetting impairment substances

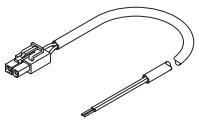
Ordering data			
	Cable length [m]	Part no.	Type
Motor cable			
	2.5	**5219197**	**NEBM-H6G4-E-2.5-Q13N-LE4**
	5	**5219198**	**NEBM-H6G4-E-5-Q13N-LE4**
	7.5	**5219199**	**NEBM-H6G4-E-7.5-Q13N-LE4**
	10	**5219200**	**NEBM-H6G4-E-10-Q13N-LE4**
	15	**8097203**	**NEBM-H6G4-E-15-Q13N-LE4**
	20	**8097204**	**NEBM-H6G4-E-20-Q13N-LE4**
	25	**8097205**	**NEBM-H6G4-E-25-Q13N-LE4**
Encoder cable			
	2.5	**5219213**	**NEBM-REG6-E-2.5-Q14N-REG6**
	5	**5219214**	**NEBM-REG6-E-5-Q14N-REG6**
	7.5	**5219215**	**NEBM-REG6-E-7.5-Q14N-REG6**
	10	**5219216**	**NEBM-REG6-E-10-Q14N-REG6**
	15	**8097200**	**NEBM-REG6-E-15-Q14N-REG6**
	20	**8097201**	**NEBM-REG6-E-20-Q14N-REG6**
	25	**8097202**	**NEBM-REG6-E-25-Q14N-REG6**
Adapter for encoder cable (absolutely essential)			
	**For single turn with CMMT-AS**		
	0.5	**8097197**	**NEFM-REG6-K-0.5-R3G8**
	**For multi-turn with CMMT-AS**[1]		
	0.5	**8097195**	**NEFM-REG6-K-0.5-B-R3G8**
	For multi-turn with CMM-B-AS[1]		
	0.5	**8097196**	**NEFM-REG6-K-0.5-B-REG6**

1) The battery is not included in the scope of delivery

Accessories

Technical data – Cables		
Designation		Connecting cable for brake
Type		NEBM-H7G2-E-...
Cable composition		2x 0.51 mm²
Cable diameter	[mm]	5.1
Pollution degree		3
Bending radius		
Fixed cable installation	[mm]	≥ 21
Flexible cable installation	[mm]	≥ 51
Ambient temperature		
Standard	[°C]	–40 ... +80
Flexible cable installation	[°C]	–10 ... +80
Cable characteristic		Suitable for energy chains
Degree of protection		IP20 (in mounted state)
CE marking (see declaration of conformity)		To EU Low Voltage Directive
Material		PVC
Note on materials		RoHS-compliant
		Contains paint-wetting impairment substances

Ordering data

	Cable length [m]	Part no.	Type
Connecting cable for brake			
	2.5	**5219205**	**NEBM-H7G2-E-2.5-Q14N-LE2**
	5	**5219206**	**NEBM-H7G2-E-5-Q14N-LE2**
	7.5	**5219207**	**NEBM-H7G2-E-7.5-Q14N-LE2**
	10	**5219208**	**NEBM-H7G2-E-10-Q14N-LE2**
	15	**8097206**	**NEBM-H7G2-E-15-Q14N-LE2**
	20	**8097207**	**NEBM-H7G2-E-20-Q14N-LE2**
	25	**8097208**	**NEBM-H7G2-E-25-Q14N-LE2**

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Subject to change