

Servo motors EMMB-AS



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 single-turn absolute displacement encoder
- Optimised connection technology
- Winding variants
 - For single-phase motor controller
 - Speed-optimised
- Holding brake

Gear units EMGA-EAS/-SAS

→ Page 13



- Low-backlash planetary gear unit
- Gear ratio $i = 3$ and 5 , available ex-stock
- Life-time lubrication
- Protection class: IP54
- Other gear unit types, ratios, designs and versions on request

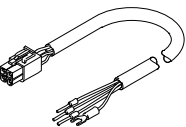
Motor controllers CMMB-AS

→ Internet: cmm



- Digital servo controller (100 W ... 700 W)
- For controlling AC servo motors
- Integrated brake chopper
- I/O interface
- Position controller with closed-loop position control (32 position sets)
- Speed controller
- Torque control via current regulator
- Range of control functions

Motor and encoder cables NEBM → Page 15



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

Axial and parallel kits EAMM

→ Internet: eamm



- Defined 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

Servo motors EMMB-AS

Type codes

EMMB – AS – 80 – 07 – K – S B

Type

EMMB	Motor
------	-------

Motor type

AS	Servo motor
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Motor flange size

40	40 mm
60	60 mm
80	80 mm

Performance class

01	100 W
02	200 W
04	400 W
07	750 W

Output shaft

–	Smooth shaft (standard)
K	Shaft to DIN 6885 (with feather key)

Measuring unit

S	Absolute encoder, single turn
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Brake

–	Without brake
B	With brake

Servo motors EMMB-AS

Technical data



Motors and motor controllers from Festo are specially matched to each other. Fault-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]	1.4	1.4	2.4	3.8
Continuous stall current	[A]	1.54	1.5	2.6	4.2
Peak current	[A]	4.2	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
Standstill torque	[Nm]	0.352	0.7	1.4	2.63
Nominal speed	[rpm]	3000	3000	3000	3000
Maximum speed	[rpm]	6500	6000	6000	5000
Motor constant	[Nm/A]	0.265	0.48	0.562	0.662
Voltage constant (phase-to-phase)	[mV/min]	16	29	34	40
Winding resistance	[Ω]	5.53	11.2	5.8	2.1
Winding inductance	[mH]	6	20.9	11.5	10.5
Total moment of inertia of drive output					
Without brake	[kgcm ²]	0.059	0.214	0.405	1.087
With brake	[kgcm ²]	–	0.218	0.409	1.099
Shaft load at nominal speed					
Radial	[N]	80	180	180	335
Axial	[N]	40	90	90	167
Brake					
Operating voltage	[V DC]	–	24	24	24
Power	[W]	–	7.2	7.2	11.5
Holding torque	[Nm]	–	1.3	1.3	3.2
Mass moment of inertia	[kgcm ²]	–	0.004	0.004	0.012

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

Servo motors EMMB-AS

Technical data

Technical data – Encoders		
Measuring unit		Absolute, single-turn
Interface		Nikon A-format
Measuring principle		Optical
Resolution	[bit]	20
Angular accuracy	[arcmin]	20
Operating voltage	[V DC]	5 (±5%)
Current consumption	[mA]	130
Maximum speed	[rpm]	6000

Operating and environmental conditions				
Flange size		40	60	80
Conforms to		IEC60034		
Degree of protection				
Motor shaft (without radial shaft seal)		IP50		
Motor shaft (with radial shaft seal)		–	IP54	
Motor housing		IP50	IP65	
Ambient temperature	[°C]	–20 ... +40		
Storage temperature	[°C]	–20 ... +70		
Insulation class		F (to 155 °C)		
Temperature monitoring		None		
Rating class to EN 60034-1		S1 (continuous operation)		
Relative humidity	[%]	0 ... 90 (non-condensing)		
CE marking (see declaration of conformity)		To EU Low Voltage Directive To EU EMC Directive ¹⁾		
Certification		c UL us - Recognized (OL)		
Note on materials		RoHS compliant Contains paint-wetting impairment substances		

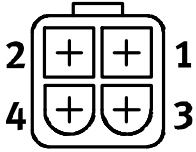
- 1) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp → Certificates.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

Servo motors EMMB-AS

Technical data

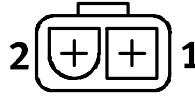
Pin allocation – Motor side

Motor



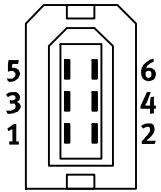
PIN	Function
1	U Phase
2	V Phase
3	W Phase
4	PE Protective earth

Brake



PIN	Function
1	BR+
2	BR-

Encoder



PIN	Function
1	Vcc
2	GND
3	n.c.
4	n.c.
5	SD+
6	SD-

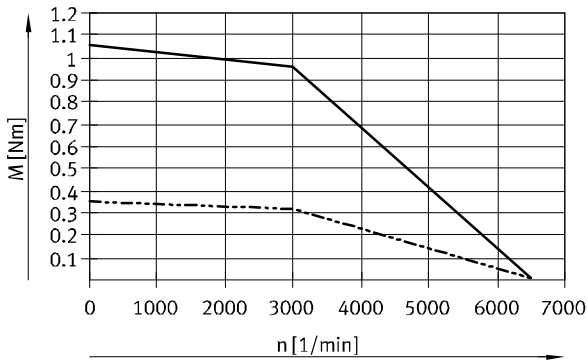
Servo motors EMMB-AS

Technical data

Torque M as a function of speed n

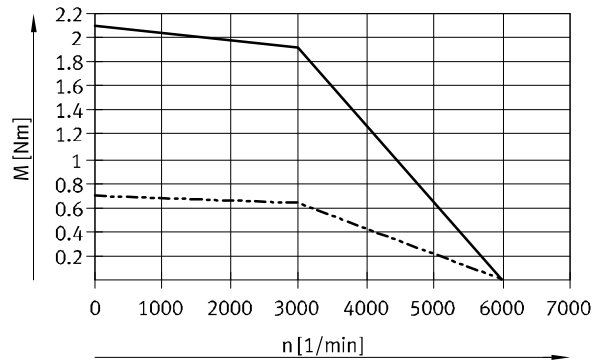
Flange size 40

Performance class 01



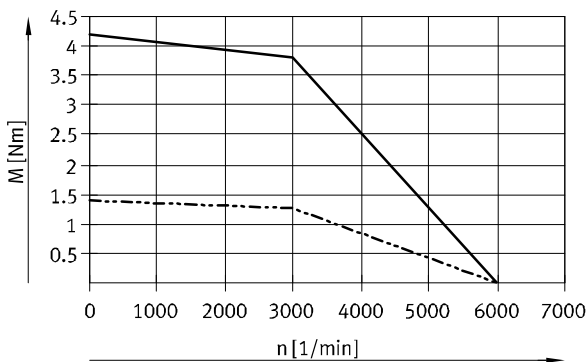
Flange size 60

Performance class 02



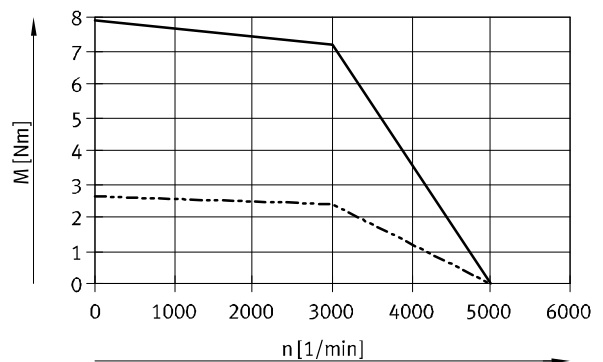
Flange size 60

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.

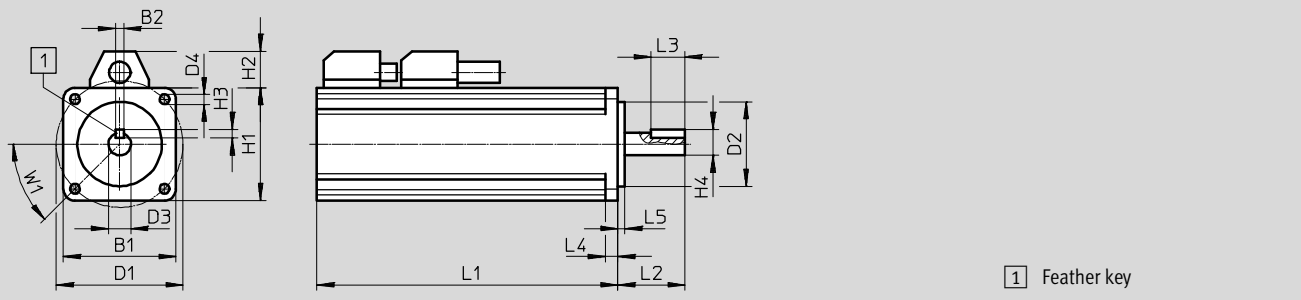
Servo motors EMMB-AS

Technical data

Dimensions

Download CAD data → www.festo.com

EMMB-AS-40-...-S, without brake



Type	B1	B2	D1 ∅ ±0.2	D2 ∅ -0.021	D3 ∅ -0.013	D4 ∅	H1	H2 max.
Without feather key	40	-	45	30	8	3.5	40	13
With feather key		3						

Type	H3	H4	L1	L2	L3	L4	L5	W1
Without feather key	-	-0.1	±1	+0.5/-0.7	-	5	±0.2	45°
With feather key	3	9.2	107	20	12			

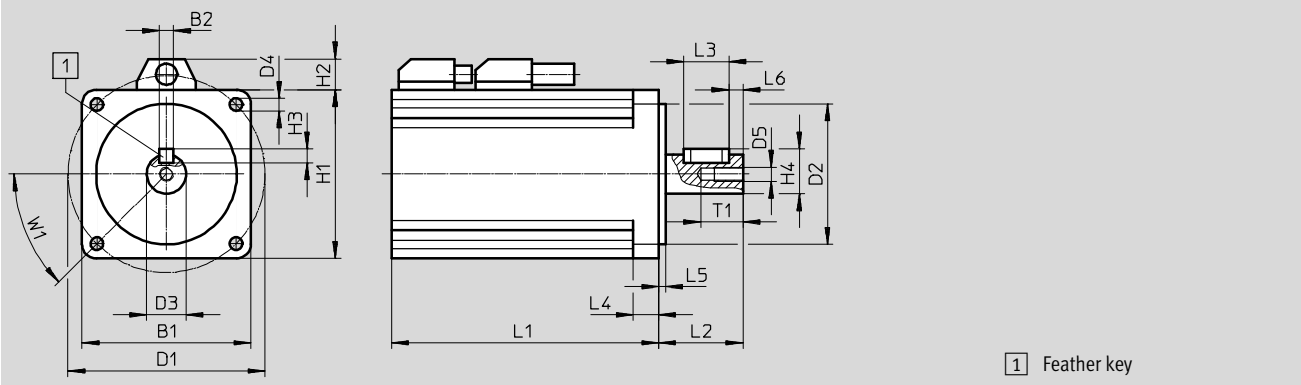
Servo motors EMMB-AS

Technical data

Dimensions

Download CAD data → www.festo.com

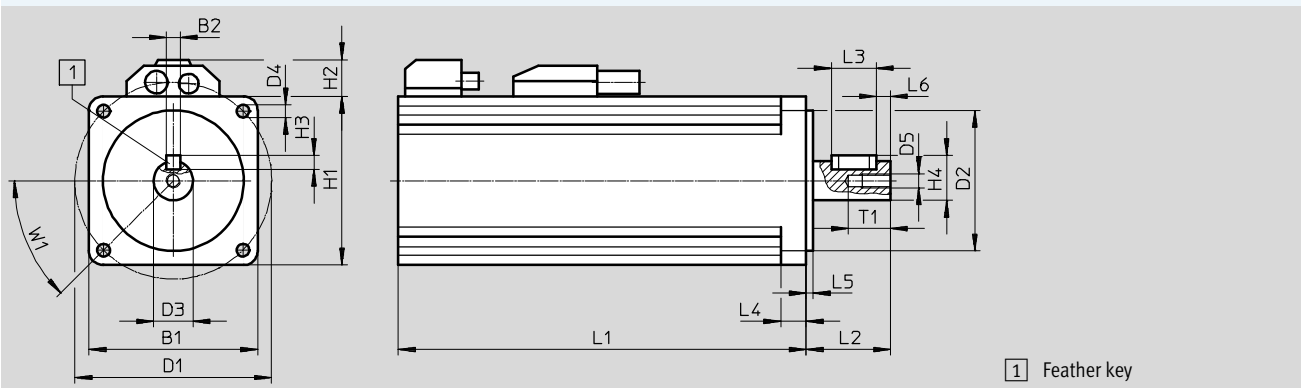
EMMB-AS-60-02-...-S, without brake



Type	B1	B2	D1 ∅	D2 ∅	D3 ∅	D4 ∅	D5	H1	H2
Without feather key	60	-	±0.1	-0.016	-0.011	4.5	M5	+0.15	max.
With feather key		5	70	50	14	4.5	M5	60	11

Type	H3	H4	L1	L2	L3	L4	L5	L6	T1	W1
Without feather key	-	-	±1.5	+1/-0.5	-	±1	2.5	-	15	45°
With feather key	5	16			95			29.5		

EMMB-AS-60-02-...-SB, with brake



Type	B1	B2	D1 ∅	D2 ∅	D3 ∅	D4 ∅	D5	H1	H2
Without feather key	60	-	±0.1	-0.016	-0.011	4.5	M5	60	max.
With feather key		5	70	50	14	4.5	M5	60	13

Type	H3	H4	L1	L2	L3	L4	L5	L6	T1	W1
Without feather key	-	-	±1.5	+1/-0.5	-	±1	2.5	-	15	45°
With feather key	5	16			145			29.5		

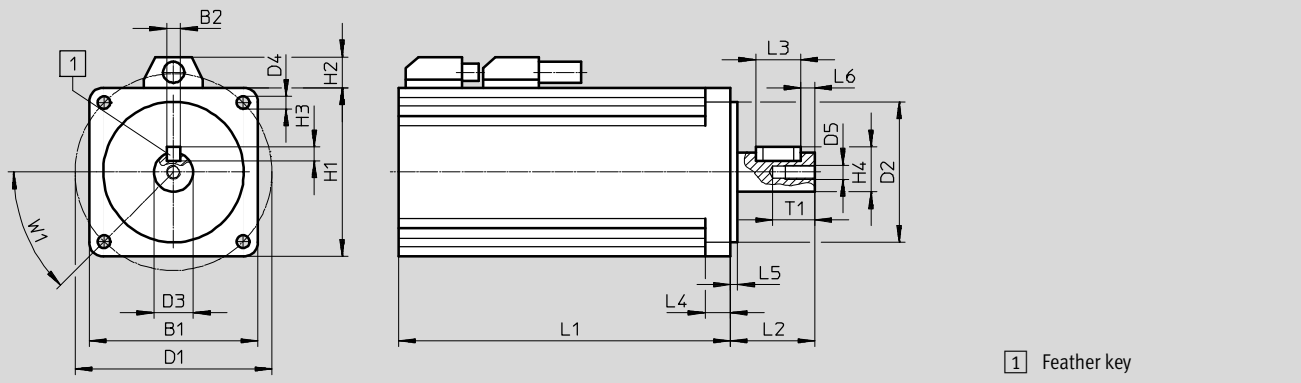
Servo motors EMMB-AS

Technical data

Dimensions

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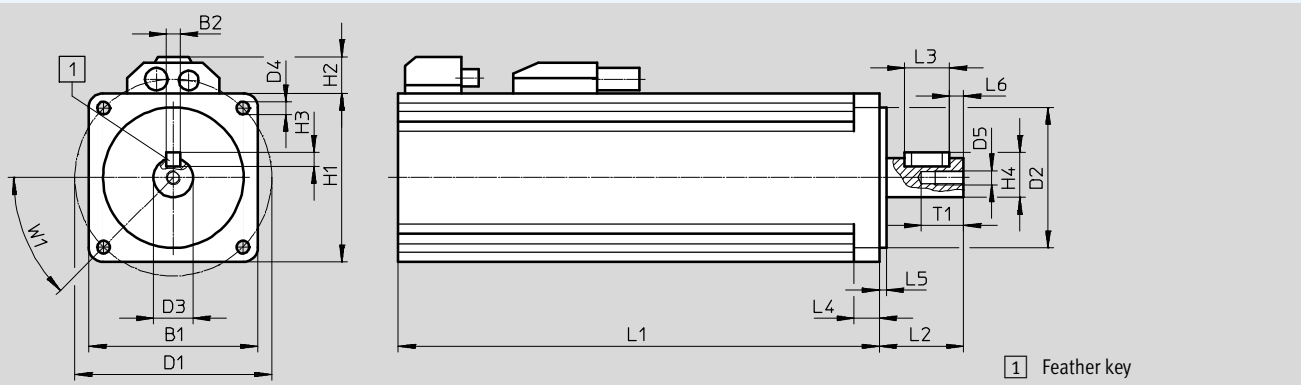
EMMB-AS-60-04-...-S, without brake



Type	B1	B2	D1 ∅ ±0.1	D2 ∅ -0.016	D3 ∅ -0.011	D4 ∅	D5	H1	H2 max.
Without feather key	60	-	70	50	14	4.5	M5	60	11
With feather key		5							

Type	H3	H4	L1	L2	L3	L4	L5	L6	T1	W1
Without feather key	-	-	118	29.5	-	9	2.5	-	15	45°
With feather key	5	16			16			5		

EMMB-AS-60-04-...-SB, with brake



Type	B1	B2	D1 ∅ ±0.1	D2 ∅ -0.016	D3 ∅ -0.011	D4 ∅	D5	H1	H2 max.
Without feather key	60	-	70	50	14	4.5	M5	60	13
With feather key		5							

Type	H3	H4	L1	L2	L3	L4	L5	L6	T1	W1
Without feather key	-	-	171	29.5	-	9	2.5	-	15	45°
With feather key	5	16			16			5		

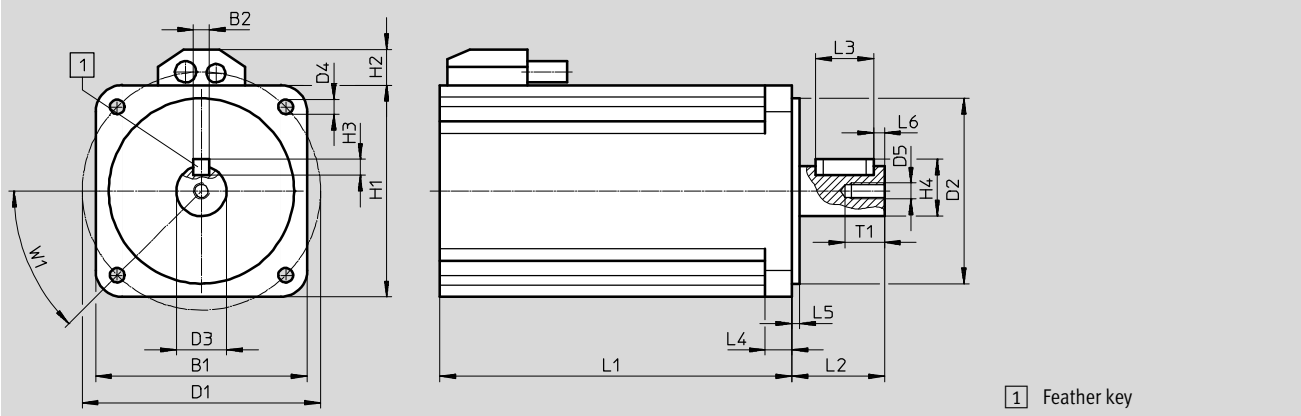
Servo motors EMMB-AS

Technical data

Dimensions

Download CAD data → www.festo.com

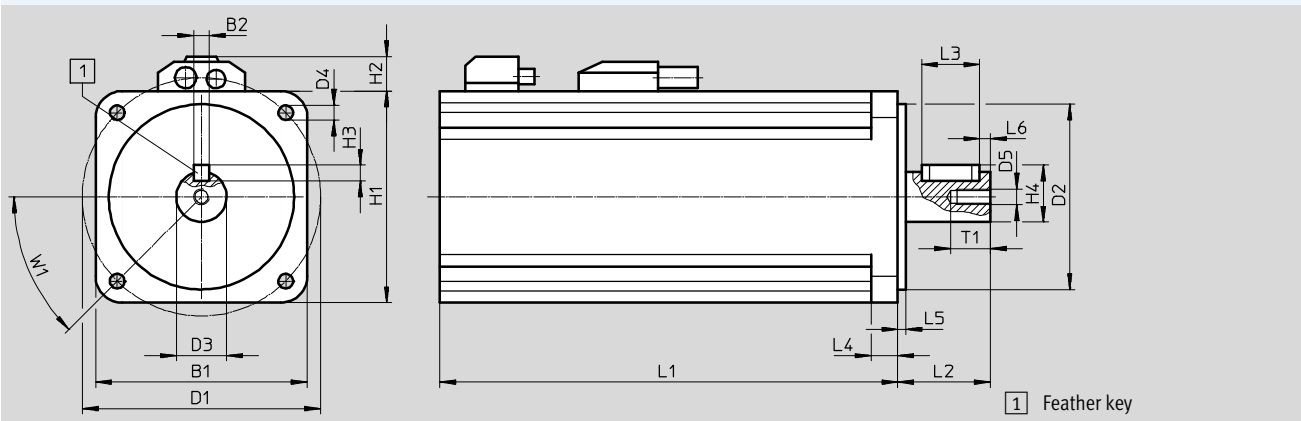
EMMB-AS-80-...-S, without brake



Type	B1	B2	D1 ∅ ±0.1	D2 ∅ -0.02	D3 ∅ -0.013	D4 ∅	D5	H1	H2 max.
Without feather key	80	-	90	70	19	5.5	M6	80	13.5
With feather key		6							

Type	H3	H4 -0.13	L1 ±1.5	L2 +0.9/-0.5	L3	L4 ±1	L5	L6	T1	W1
Without feather key	-	-	133	34.5	-	10	3	-	15	45°
With feather key	6	21.5			22			4		

EMMB-AS-80-...-SB, with brake



Type	B1	B2	D1 ∅ ±0.1	D2 ∅ -0.02	D3 ∅ -0.013	D4 ∅	D5	H1	H2 max.
Without feather key	80	-	90	70	19	5.5	M6	80	13
With feather key		6							

Type	H3	H4 -0.13	L1 ±1.5	L2 +0.9/-0.5	L3	L4 ±1	L5	L6	T1	W1
Without feather key	-	-	173	34.5	-	10	3	-	15	45°
With feather key	6	21.5			22			4		

Servo motors EMMB-AS

Technical data

Ordering data						Part No.	Type
Nominal power [W]				Variant			
100	200	400	750	With feather key	With brake		
Flange size 40							
■						5219168	EMMB-AS-40-01-S
■				■		5219176	EMMB-AS-40-01-K-S
Flange size 60							
	■					5219169	EMMB-AS-60-02-S
		■				5219170	EMMB-AS-60-04-S
	■				■	5219173	EMMB-AS-60-02-SB
		■			■	5219174	EMMB-AS-60-04-SB
	■			■		5219177	EMMB-AS-60-02-K-S
		■		■		5219178	EMMB-AS-60-04-K-S
	■			■	■	5219181	EMMB-AS-60-02-K-SB
		■		■	■	5219182	EMMB-AS-60-04-K-SB
Flange size 80							
			■			5219171	EMMB-AS-80-07-S
			■		■	5219175	EMMB-AS-80-07-SB
			■	■		5219179	EMMB-AS-80-07-K-S
			■	■	■	5219183	EMMB-AS-80-07-K-SB

Servo motors EMMB-AS

Accessories

Gear unit EMGA



Technical data				
For motor flange size		40		60
Gear unit type		EMGA-40-P-G...-40		EMGA-60-P-G...-60
Gear ratio	[i]	3	5	3 5
Gear unit type		Planetary gear unit		
Continuous output torque ¹⁾	[Nm]	11	14	28 40
Max. output torque ²⁾	[Nm]	17.6	22	45 64
Max. drive speed	[rpm]	18000		13000
Torsional rigidity	[Nm/arcmin]	1		2.3
Torsional backlash	[deg]	0.25		0.17
Mass moment of inertia ³⁾	[kgcm ²]	0.031	0.019	0.135 0.078
Max. efficiency	[%]	98		
Operating temperature ⁴⁾	[°C]	-25 ... +90		
Degree of protection		IP54		
Product weight	[g]	350		900
Note on materials		RoHS compliant		

For motor flange size		80		
Gear unit type		EMGA-80-P-G...-80		
Gear ratio	[i]	3		5
Gear unit type		Planetary gear unit		
Continuous output torque ¹⁾	[Nm]	85		110
Max. output torque ²⁾	[Nm]	136		176
Max. drive speed	[rpm]	7000		
Torsional rigidity	[Nm/arcmin]	6		
Torsional backlash	[deg]	0.12		
Mass moment of inertia ³⁾	[kgcm ²]	0.77		0.45
Max. efficiency	[%]	98		
Operating temperature ⁴⁾	[°C]	-25 ... +90		
Degree of protection		IP54		
Product weight	[g]	2000		
Note on materials		RoHS compliant		

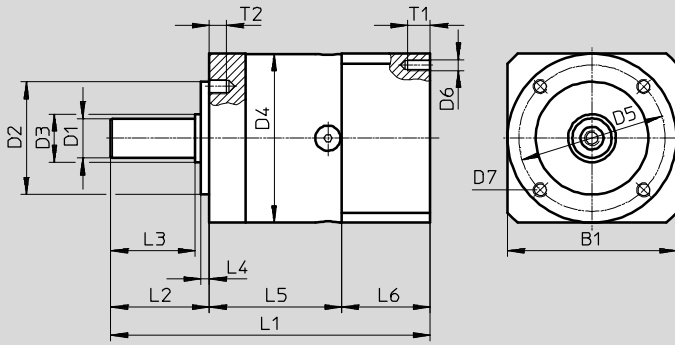
- 1) At the output shaft
- 2) The specifications refer to an output shaft speed of 100 rpm as well as operating mode S1 and a temperature of 30°C
- 3) In relation to the drive shaft
- 4) Note the temperature range of the motor

Servo motors EMMB-AS

Accessories

Dimensions

Download CAD data → www.festo.com



Type	B1	D1 ∅ H7	D2 ∅ H7	D3 ∅	D4 ∅	D5 ∅	D6	D7
EMGA-40-P-G...-40	40	10	26	12	40	34	M3	M4
EMGA-60-P-G...-60	60	14	40	17	60	52	M4	M5
EMGA-80-P-G...-80	80	20	60	25	80	70	M5	M6

Type	L1	L2	L3 ±0.2	L4 ±0.2	L5	L6	T1	T2
EMGA-40-P-G...-40	93.5	26	23	2	39	28.5	8	6
EMGA-60-P-G...-60	113.5	35	30	3	47	31	10	8
EMGA-80-P-G...-80	138.5	40	36	3	60	38.5	12	10

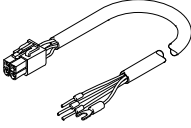
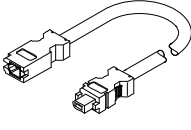
Ordering data

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

Servo motors EMMB-AS

Accessories

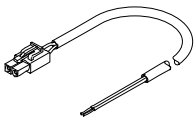
Technical data – Cables				
Designation	Motor cable		Encoder cable	
Type	NEBM-H6G4-K-...	NEBM-H6G4-E-...	NEBM-REG6-K-...	NEBM-REG6-E-...
Cable composition	4x 0.79 mm ²		2x 0.51 mm ² + 4x 0.205 mm ²	
Cable diameter [mm]	7.4	7.3	8.3	
Degree of contamination	3		3	
Bending radius				
Fixed cable installation [mm]	≥ 74	≥ 73	≥ 83	
Flexible cable installation [mm]	≥ 111	≥ 100	≥ 100	
Ambient temperature				
Standard [°C]	-25 ... +90		-40 ... +80	
Flexible cable installation [°C]	-25 ... +90		-10 ... +80	
Cable characteristic	Standard	Suitable for use with energy chains	Standard	Suitable for use with energy chains
Degree of protection	IP20 (in assembled state)		IP20 (in assembled state)	
CE marking (see declaration of conformity)	To EU Low Voltage Directive		To EU Low Voltage Directive	
Material	TPE-E	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					
	Standard				
	2.5	5219193	NEBM-H6G4-K-2.5-Q13N-LE4		
	5	5219194	NEBM-H6G4-K-5-Q13N-LE4		
	7.5	5219195	NEBM-H6G4-K-7.5-Q13N-LE4		
	10	5219196	NEBM-H6G4-K-10-Q13N-LE4		
	Suitable for use with energy chains				
	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		
Encoder cable					
	Standard				
	2.5	5219209	NEBM-REG6-K-2.5-Q14N-REG6		
	5	5219210	NEBM-REG6-K-5-Q14N-REG6		
	7.5	5219211	NEBM-REG6-K-7.5-Q14N-REG6		
	10	5219212	NEBM-REG6-K-10-Q14N-REG6		
	Suitable for use with energy chains				
	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		

Servo motors EMMB-AS

Accessories

Technical data – Cables		
Designation	Connecting cable for brake	
Type	NEBM-H7G2-K-...	NEBM-H7G2-E-...
Cable composition	2x 0.51 mm ²	
Cable diameter [mm]	5.4	5.1
Degree of contamination	3	
Bending radius	Bending radius	
Fixed cable installation [mm]	≥ 27	≥ 21
Flexible cable installation [mm]	≥ 81	≥ 51
Ambient temperature	Ambient temperature	
Standard [°C]	-40 ... +80	
Flexible cable installation [°C]	-10 ... +80	
Cable characteristic	Standard	Suitable for use with energy chains
Degree of protection	IP20 (in assembled 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			
	Standard		
	2.5	5219201	NEBM-H7G2-K-2.5-Q14N-LE2
	5	5219202	NEBM-H7G2-K-5-Q14N-LE2
	7.5	5219203	NEBM-H7G2-K-7.5-Q14N-LE2
	10	5219204	NEBM-H7G2-K-10-Q14N-LE2
	Suitable for use with energy chains		
	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