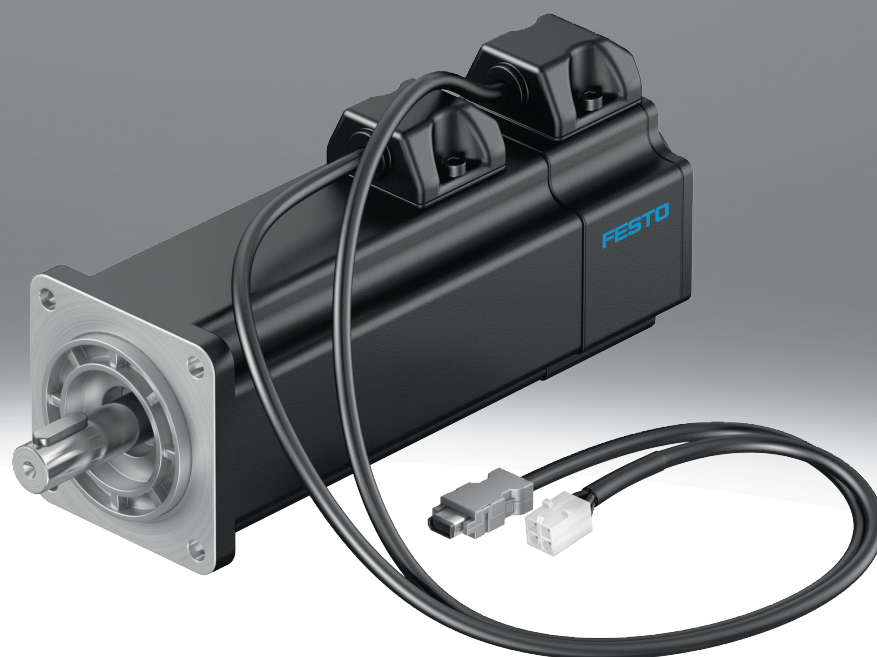


Servo motor EMMB-AS

FESTO



Characteristics

At a glance

- Dynamic, brushless, permanent magnet synchronous servo motors
- Reliable, dynamic, precise

Digital absolute encoder system:

- Single turn
- Multi-turn

Winding variants:

- Rotational speed optimised
- For single-phase motor controllers

Degree of protection:

- IP40 (motor shaft without radial shaft seal) for flange sizes 40/60/80/100
- IP54 (motor shaft with rotary shaft seal)
- IP65 (motor housing without connection technology)

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

Optional:

- Shaft with feather key
- Holding brake

Engineering tools Link [electric motion sizing](#)



Save time with engineering tools: Smart engineering for the optimal solution. Our goal is to increase your productivity. Our engineering tools play an integral part in achieving this goal. They help you size your system correctly, tap into unimagined productivity reserves and generate additional productivity along the entire value chain. In every phase of your project, from the initial contact to the modernisation of your machine, you will come across a number of different tools that will be of use to you.

Diagrams Link [emmb-as](#)



The diagrams shown in this document are also available online. These can be used to display precise values.

Measuring unit

[S]	Absolute encoder, single turn	[M]	Absolute encoder, multi-turn
The angular position is assigned to a unique value in coded form.		A unique value in coded form is assigned to the angular position and each full turn.	
• The position is only detected within one turn. All subsequent turns need to be counted by the higher-level device. • When switched off, the position is only sensed within one turn. • Following switch-on, a homing run is required.		• This type counts the full turns until the specified maximum is reached (including when switched off). • Homing is only required once it has been installed in the application.	

Brake

The holding brake should not be used as a safety brake.

Type code

001	Series	
EMMB	Motor	
002	Motor type	
AS	AC synchronous	
003	Flange size, motors [mm]	
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 with featherkey according to DIN 6885	
006	Electrical connection	
S	Straight plug	
007	Cable length [cm]	
30	30 cm	
008	Measuring unit	
M	Absolute encoder, multi-turn	
S	Absolute encoder, single turn	
009	Brake	
	None	
B	With brake	

Datasheet

General technical data				
Flange size, motors [mm]	40	60		80
Performance class	100 W [01]	200 W [02]	400 W [04]	750 W [07]
Nominal operating voltage DC	300 V			
Nominal motor current	1.3 A	1.4 A	2.4 A	3.8 A
Continuous stall current	1.43 A	1.5 A	2.6 A	4.2 A
Peak current	3.9 A	4.2 A	7.2 A	11.4 A
Nominal power rating of motor	100 W	200 W	400 W	750 W
Nominal torque	0.32 Nm	0.64 Nm	1.27 Nm	2.39 Nm
Peak torque	0.96 Nm	1.92 Nm	3.81 Nm	7.17 Nm
Standstill torque	0.352 Nm	0.7 Nm	1.4 Nm	2.63 Nm
Nominal rotary speed	3,000 rpm			
Max. rotational speed	6,000 rpm			5,000 rpm
Motor constant	0.268 Nm/A	0.48 Nm/A	0.562 Nm/A	0.662 Nm/A
Voltage constant, phase-to-phase	16.2 mV/min	29 mV/min	34 mV/min	40 mV/min
Number of pole pairs	5	3		
Phase-phase winding resistance	7.9 Ohm	11.2 Ohm	5.8 Ohm	2.1 Ohm
Phase-phase winding inductance	10.5 mH	20.9 mH	11.5 mH	10.5 mH
Total mass moment of inertia of output ¹⁾	0.059 kgcm ² ; 0.063 kgcm ²	0.214 kgcm ² ; 0.234 kgcm ²	0.405 kgcm ² ; 0.425 kgcm ²	0.942 kgcm ² ; 0.978 kgcm ²
Permissible axial shaft load	60 N	90 N		167.5 N
Permissible radial shaft load	120 N	180 N		335 N

1) Without brake/with brake

Technical data Brakes				
Flange size, motors [mm]	40	60		80
Performance class	100 W [01]	200 W [02]	400 W [04]	750 W [07]
Operating voltage DC for brake	24 V			
Power consumption, brake	5.9 W	7.2 W		11.5 W
Brake holding torque	0.32 Nm	1.3 Nm		3.2 Nm

Technical data – Encoder		
Rotor position sensor	Absolute encoder, single turn	Absolute encoder, multi-turn
Rotor position encoder interface	Nikon A-format	
rotor position sensor, DC operating voltage	5 V	
rotor position sensor, DC operating voltage range	4.75 ... 5.25 V	
Rotor position sensor, encoder measuring principle	Optical	
rotor position sensor, max. operating speed	6,000 rpm	
rotor position sensor, position values per revolution	1,048,576	
rotor position sensor, absolute detectable revolutions	1	65,536
Rotor position transducer resolution	20 bit	
rotor position sensor, system accuracy of angle measurement	-120 ... 120 arcsec	
rotor position sensor, temperature range	-20 ... 95°C	

Datasheet

Operating and environmental conditions			
Flange size, motors [mm]	40	60	80
Conforms to standard	IEC 60034		
Motor type to EN 60034-7	IM B5, IM V1, IM V3		
Degree of protection	IP65		
Note on degree of protection ¹⁾	IP40 for motor shaft without rotary shaft seal IP54 for motor shaft with rotary shaft seal IP65 for motor housing without connection technology		
Ambient temperature	-15 ... 40°C		
Note on ambient temperature	Up to 60°C with derating of -1.5% per degree Celsius		
Storage temperature	-20 ... 55°C		
Max. winding temperature	155°C		
Insulation protection class	—		
Temperature monitoring	Digital motor temperature transmission via Nikon A format		
Rating class as per EN 60034-1	S1		
Temperature class as per EN 60034-1	F		
Relative air humidity	0 - 90%		
Concentricity, coaxiality, axial runout to DIN SPEC 42955	N		
Balance quality	G 2.5		
Pollution degree	2		
Max. installation height	4,000 m		
Note on max. installation height	As of 1,000 m: only with derating of -1.0% per 100 m		
Bearing lifetime under nominal conditions	20,000 h		
CE mark (see declaration of conformity) ²⁾	To EU EMC Directive To EU Low Voltage Directive In accordance with EU RoHS Directive		
UKCA marking (see declaration of conformity) ³⁾	To UK instructions for EMC To UK RoHS instructions To UK regulations for electrical equipment		
Approval	c UL us - Recognised (Oil)		
Certificate issuing authority	UL E342973		
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		
LABS (PWIS) conformity	VDMA24364 zone III		
Note on materials	RoHS compliant		

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

2) More information www.festo.com/catalogue/emmb → Support/Downloads

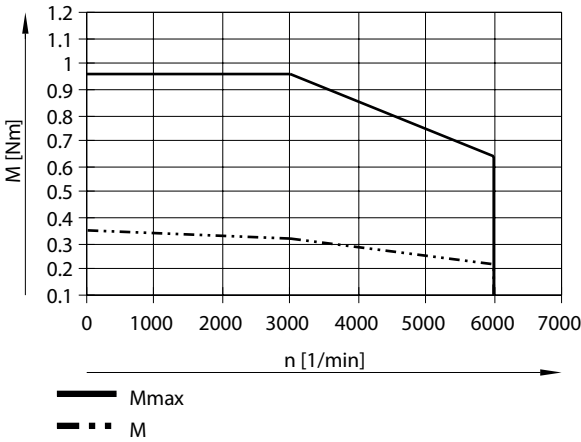
3) More information www.festo.com/catalogue/emmb → Support/Downloads

Weight				
Flange size, motors [mm]	40	60		80
Performance class	100 W [01]	200 W [02]	400 W [04]	750 W [07]
Product weight ¹⁾	570 g; 770 g	1,100 g; 1,400 g	1,600 g; 1,900 g	2,800 g; 3,400 g

1) Without brake/with brake

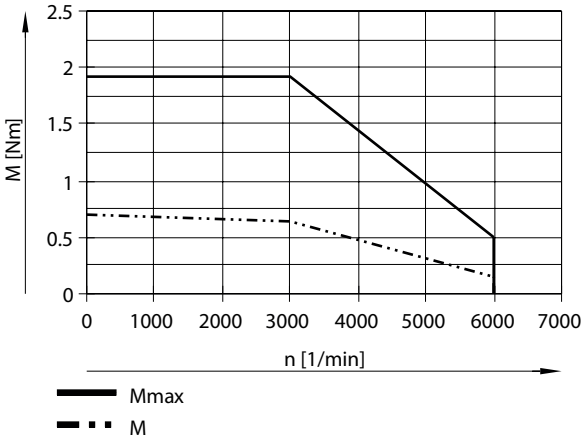
Datasheet

Torque M as a function of rotational speed n for EMMB-AS-40



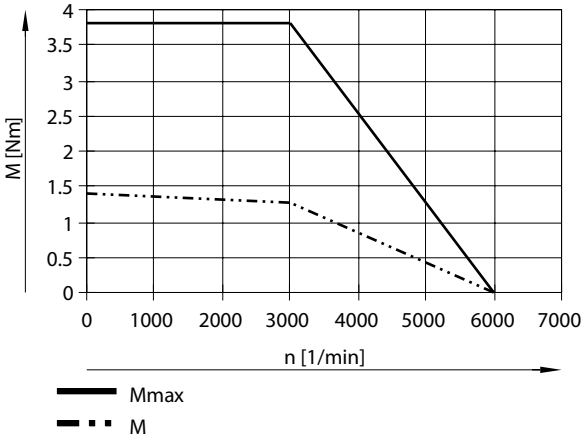
Typical motor characteristic curve with nominal voltage and optimal motor controller.

Torque M as a function of rotational speed n for EMMB-AS-60-02



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

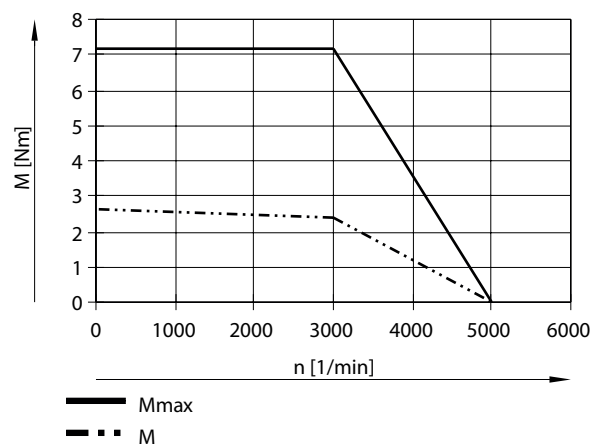
Torque M as a function of rotational speed n for EMMB-AS-60-04



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

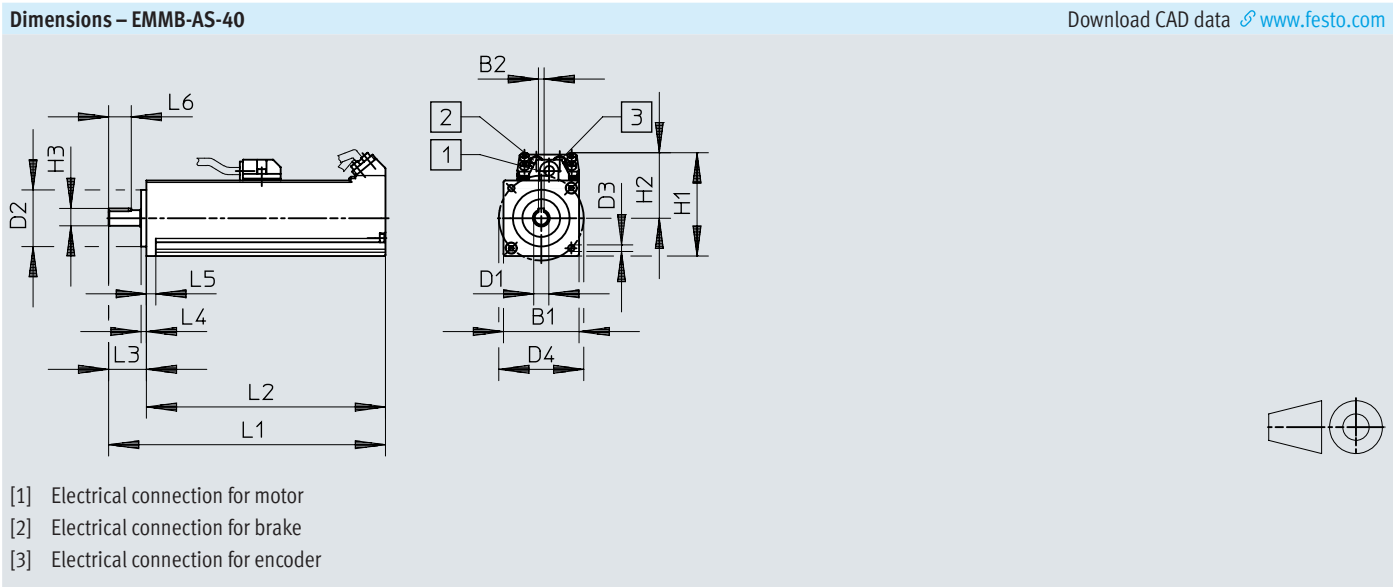
Datasheet

Torque M as a function of rotational speed n for EMMB-AS-80



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

Dimensions



	B1	B2	D1 Ø	D2 Ø	D3 Ø	D4 Ø
		-0,014	-0,013	-0,021		±0,2
EMMB-AS-40-...	40	-	8	30	3,5	45
EMMB-AS-40-...-K		3				

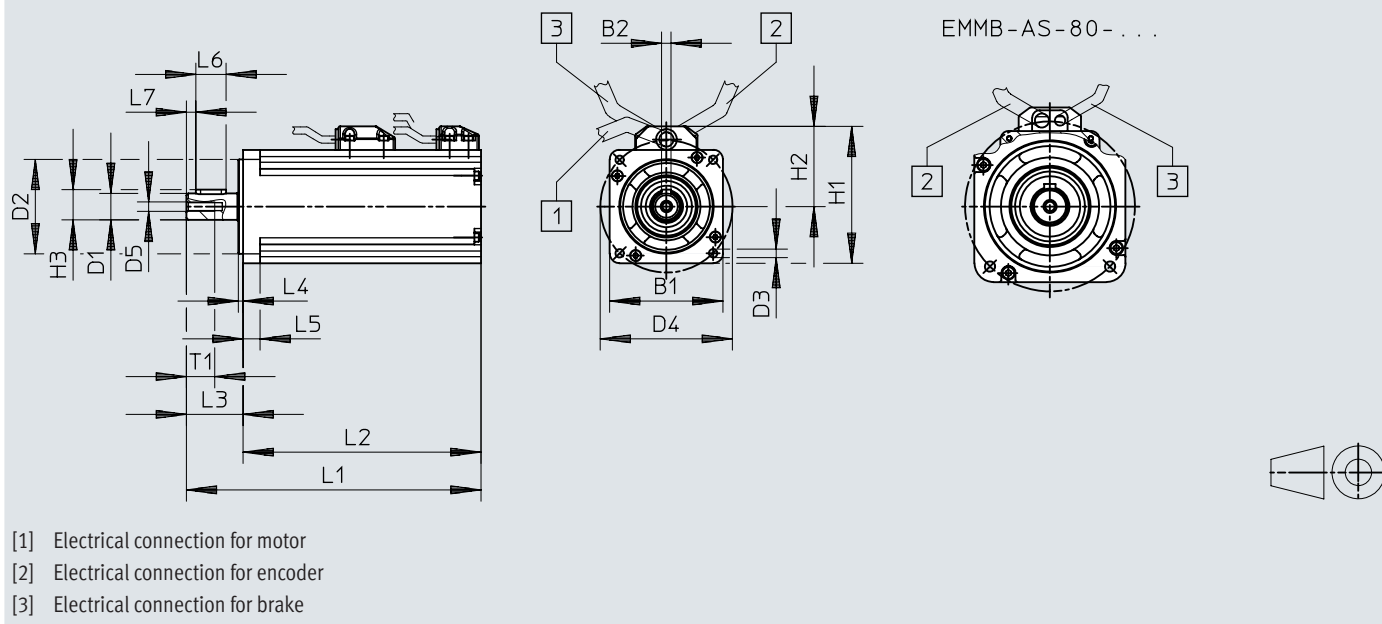
	H1 max.	H2 max.	H3	L1		L2	
				1) +1,5/-1,7	2) +1,5/-1,7	1) ±1	2) ±1
EMMB-AS-40-...	70	50	-	116,6	146,6	96,6	126,6
EMMB-AS-40-...-K			9,7				

	L3	L4	L5	L6
	+0,5/-0,7			
EMMB-AS-40-...	20	2,8	5	-
EMMB-AS-40-...-K				12

1) Without brake
2) With brake

Dimensions

Dimensions – EMMB-AS-60/-80

Download CAD data www.festo.com

	B1	B2	D1 ø	D2 ø	D3 ø	D4 ø ±0,1	D5 ø
EMMB-AS-60-02-...	60	–	14 _{-0,011}	50 _{-0,016}	4,5	70	5
EMMB-AS-60-02-...-K		5					
EMMB-AS-60-04-...	60	–	14 _{-0,011}	50 _{-0,016}	4,5	70	5
EMMB-AS-60-04-...-K		5					
EMMB-AS-80-07-...	80	–	19 _{-0,013}	70 _{-0,02}	5,5	90	6
EMMB-AS-80-07-...-K		6					

	H1	H2	H3 -0,13	L1		L2	
				1) ±1,5	2) ±1,5	1) ±1,5	2) ±1,5
EMMB-AS-60-02-...	72,5	42,5	16	124 _{±2,5}	156 _{±2,5}	94	126
EMMB-AS-60-02-...-K							
EMMB-AS-60-04-...	72,5	42,5	16	150 _{±2,5}	182 _{±2,5}	120	152
EMMB-AS-60-04-...-K							
EMMB-AS-80-07-...	94	54	21,5	164 _{±2,4/-2}	193,5 _{±2,4/-2}	129,5	159
EMMB-AS-80-07-...-K							

	L3	L4	L5 ±1	L6	L7	T1
EMMB-AS-60-02-...	30 _{±1}	2,5	9	–	–	15
EMMB-AS-60-02-...-K				16	5	
EMMB-AS-60-04-...	30 _{±1}	2,5	9	–	–	15
EMMB-AS-60-04-...-K				16	5	
EMMB-AS-80-07-...	34,5 _{±0,9/-0,5}	3	10	–	–	15
EMMB-AS-80-07-...-K				22	4	

1) Without brake

2) With brake

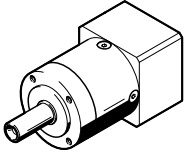
Ordering data

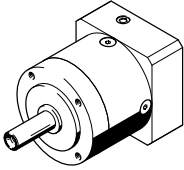
Flange size 40					
Performance class	Measuring unit	Output shaft	Brake	Part no.	Type
100 W	Absolute encoder, multi-turn	Smooth shaft	None	8097167	EMMB-AS-40-01-S30M
			With brake	8097168	EMMB-AS-40-01-S30MB
		Shaft with featherkey according to DIN 6885	None	8097169	EMMB-AS-40-01-K-S30M
			With brake	8097170	EMMB-AS-40-01-K-S30MB
	Absolute encoder, single turn	Smooth shaft	None	8097163	EMMB-AS-40-01-S30S
			With brake	8097164	EMMB-AS-40-01-S30SB
		Shaft with featherkey according to DIN 6885	None	8097165	EMMB-AS-40-01-K-S30S
			With brake	8097166	EMMB-AS-40-01-K-S30SB

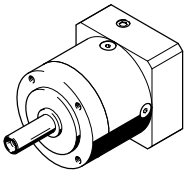
Flange size 60					
Performance class	Measuring unit	Output shaft	Brake	Part no.	Type
200 W	Absolute encoder, multi-turn	Smooth shaft	None	8097175	EMMB-AS-60-02-S30M
			With brake	8097176	EMMB-AS-60-02-S30MB
		Shaft with featherkey according to DIN 6885	None	8097177	EMMB-AS-60-02-K-S30M
			With brake	8097178	EMMB-AS-60-02-K-S30MB
	Absolute encoder, single turn	Smooth shaft	None	8097171	EMMB-AS-60-02-S30S
			With brake	8097172	EMMB-AS-60-02-S30SB
		Shaft with featherkey according to DIN 6885	None	8097173	EMMB-AS-60-02-K-S30S
			With brake	8097174	EMMB-AS-60-02-K-S30SB
400 W	Absolute encoder, multi-turn	Smooth shaft	None	8097183	EMMB-AS-60-04-S30M
			With brake	8097184	EMMB-AS-60-04-S30MB
		Shaft with featherkey according to DIN 6885	None	8097185	EMMB-AS-60-04-K-S30M
	Absolute encoder, single turn	Smooth shaft		8097179	EMMB-AS-60-04-S30S
			With brake	8097180	EMMB-AS-60-04-S30SB
		Shaft with featherkey according to DIN 6885	None	8097181	EMMB-AS-60-04-K-S30S
			With brake	8097182	EMMB-AS-60-04-K-S30SB

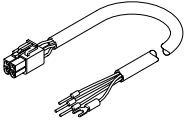
Flange size 80					
Performance class	Measuring unit	Output shaft	Brake	Part no.	Type
750 W	Absolute encoder, multi-turn	Smooth shaft	None	8097191	EMMB-AS-80-07-S30M
			With brake	8097192	EMMB-AS-80-07-S30MB
		Shaft with featherkey according to DIN 6885	None	8097193	EMMB-AS-80-07-K-S30M
			With brake	8097194	EMMB-AS-80-07-K-S30MB
	Absolute encoder, single turn	Smooth shaft	None	8097187	EMMB-AS-80-07-S30S
			With brake	8097188	EMMB-AS-80-07-S30SB
		Shaft with featherkey according to DIN 6885	None	8097189	EMMB-AS-80-07-K-S30S
			With brake	8097190	EMMB-AS-80-07-K-S30SB

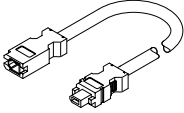
Accessories

Planetary gear for EMMB-AS-40					
	Gear unit ratio	Note on materials	Product weight	Part no.	Type
	3:1	RoHS compliant	350 g	2297684	EMGA-40-P-G3-EAS-40
	5:1			2297685	EMGA-40-P-G5-EAS-40

Planetary gear for EMMB-AS-60					
	Gear unit ratio	Note on materials	Product weight	Part no.	Type
	3:1	RoHS compliant	900 g	2297686	EMGA-60-P-G3-EAS-60
	5:1			2297687	EMGA-60-P-G5-EAS-60

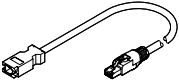
Planetary gear for EMMB-AS-80					
	Gear unit ratio	Note on materials	Product weight	Part no.	Type
	3:1	RoHS compliant	2,000 g	2297690	EMGA-80-P-G3-EAS-80
	5:1			2297691	EMGA-80-P-G5-EAS-80

Motor cable						
	Bending radius, moving cable	Cable characteristic	Ambient temperature	Cable length	Part no.	Type
	55 mm	Suitable for energy chains	-25 ... 90 °C	2.5 m	5219197	NEBM-H6G4-E-2.5-Q13N-LE4
				5 m	5219198	NEBM-H6G4-E-5-Q13N-LE4
				7.5 m	5219199	NEBM-H6G4-E-7.5-Q13N-LE4
				10 m	5219200	NEBM-H6G4-E-10-Q13N-LE4
				15 m	8097203	NEBM-H6G4-E-15-Q13N-LE4
				20 m	8097204	NEBM-H6G4-E-20-Q13N-LE4
				25 m	8097205	NEBM-H6G4-E-25-Q13N-LE4

Encoder cable						
	Bending radius, moving cable	Cable characteristic	Ambient temperature	Cable length	Part no.	Type
	55 mm	Suitable for energy chains	-40 ... 80 °C	2.5 m	5219213	NEBM-REG6-E-2.5-Q14N-REG6
				5 m	5219214	NEBM-REG6-E-5-Q14N-REG6
				7.5 m	5219215	NEBM-REG6-E-7.5-Q14N-REG6
				10 m	5219216	NEBM-REG6-E-10-Q14N-REG6
				15 m	8097200	NEBM-REG6-E-15-Q14N-REG6
				20 m	8097201	NEBM-REG6-E-20-Q14N-REG6
				25 m	8097202	NEBM-REG6-E-25-Q14N-REG6

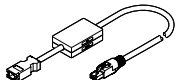
Accessories

Adapter for encoder cable for single turn with CMMT-AS

	Cable characteristic	Ambient temperature	Cable length ¹⁾	Part no.	Type
	Standard	-40 ... 80 °C	0.5 m	8097197	NEFM-REG6-K-0.5-R3G8

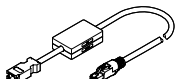
1) The adapter is mandatory.

Adapter for encoder cable for multi-turn with CMMT-AS

	Cable characteristic	Ambient temperature	Cable length ¹⁾	Part no.	Type
	Standard	-40 ... 80 °C	0.5 m	8097195	NEFM-REG6-K-0.5-B-R3G8

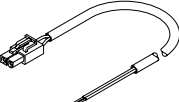
1) The adapter is definitely required. The required battery is not included in the scope of delivery.

Adapter for encoder cable for multi-turn with CMMB-AS

	Cable characteristic	Ambient temperature	Cable length ¹⁾	Part no.	Type
	Standard	-40 ... 80 °C	0.5 m	8097196	NEFM-REG6-K-0.5-B-REG6

1) The adapter is definitely required. The required battery is not included in the scope of delivery.

Connecting cable for brake

	Bending radius, moving cable	Cable characteristic	Ambient temperature	Cable length	Part no.	Type
	55 mm	Suitable for energy chains	-40 ... 80 °C	2.5 m	5219205	NEBM-H7G2-E-2.5-Q14N-LE2
				5 m	5219206	NEBM-H7G2-E-5-Q14N-LE2
				7.5 m	5219207	NEBM-H7G2-E-7.5-Q14N-LE2
				10 m	5219208	NEBM-H7G2-E-10-Q14N-LE2
				15 m	8097206	NEBM-H7G2-E-15-Q14N-LE2
				20 m	8097207	NEBM-H7G2-E-20-Q14N-LE2
				25 m	8097208	NEBM-H7G2-E-25-Q14N-LE2