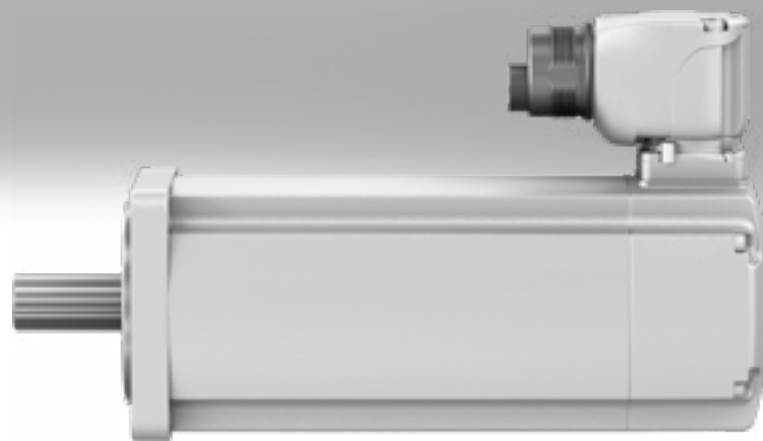


Servo motors EMMT-AS

FESTO



Key features

Everything from a single source

Motors EMMT-AS

→ Page 3



- Dynamic, brushless, permanently excited synchronous servo motors
- Ultra low cogging – supports high synchronisation even at low rotational speeds
- Digital absolute displacement encoder; choose from:
 - Single-turn
 - Multi-turn, no batteries
- Simple connection technology (OCP: one cable plug) – one connecting cable for supply and encoder
- Connector plug can be aligned with the motor
- Torque-optimised
- Speed-optimised
- Degree of protection:
 - IP40 (motor shaft)
 - IP67 (motor housing with connection technology)
 - IP67 (motor shaft with radial shaft seal made of PTFE)
- Motor temperature transmission, digital via EnDat 2.2; motor protection via CMMT-AS
- Optional:
 - Holding brake
 - Shaft with featherkey
 - Motor shaft with radial shaft seal

Gear unit EMGA-EAS/-SAS

→ Page 11



- 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

Motor cables NEBM

→ Page 12



- Suitable for energy chains
- Connection technology on motor side with degree of protection to IP67
- 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
EMMT	Servo motor
002	Motor type
AS	AC synchronous
003	Flange size, motors
60	60
004	Length
S	Short
M	Centre
L	Long
005	Output shaft
	Smooth shaft
K	Shaft to DIN 6885
X1	Customer-specific variant 1
006	Rotary shaft seal
	None
R	With standard shaft sealing ring
A	With shaft sealing ring, double lip

007	Winding
LS	Low voltage, standard
HS	High voltage, standard
LV	Low voltage, speed optimised
HV	High voltage, speed optimised
LT	Low voltage, torque optimised
HT	High voltage, torque optimised

008	Electrical connection
A	Angled plug
R	Angled connector, adjustable
DA	DIN plug
DR	Two angled plugs, adjustable
DS	Two plugs, straight
L	Connecting cable, open end
S	Straight plug
T	Terminal box

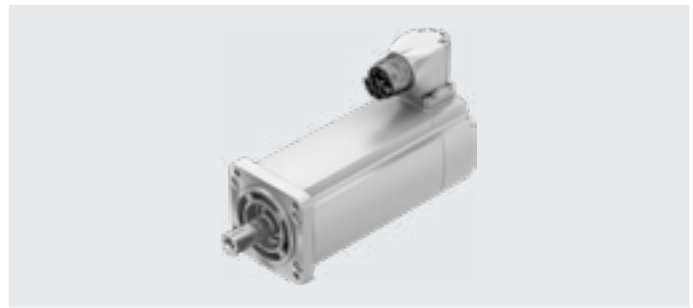
009	Measuring unit
S	Absolute encoder, single turn
M	Absolute encoder, multi-turn
SA	Absolute encoder, single turn, Hiperface
MA	Absolute encoder, multi turn, Hiperface
SX	Absolute safety encoder, single turn, Hiperface
MX	Absolute safety encoder, multi-turn, Hiperface

010	Brake
	None
B	With brake
C	Brake, reinforced

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		60					
Length		S		M		L	
Winding		LS	HS	LS	HS	LS	HS
Nominal voltage ¹⁾	[V DC]	325	565	325	565	325	565
Nominal current							
Without brake	[A]	1.6	1.6	2.4	2.4	3.2	3.2
With brake	[A]	1.4	1.4	2.2	2.2	3.0	3.0
Peak current	[A]	5.4	5.4	11.0	11.0	18.3	18.3
Nominal power							
Without brake	[W]	200	200	350	350	440	440
With brake	[W]	190	190	310	310	410	410
Nominal torque							
Without brake	[Nm]	0.64	0.64	1.1	1.1	1.4	1.4
With brake	[Nm]	0.6	0.6	1.0	1.0	1.30	1.30
Peak torque	[Nm]	1.6	1.6	3.4	3.4	5.6	5.6
Stall torque							
Without brake	[Nm]	0.7	0.7	1.24	1.24	1.66	1.66
With brake	[Nm]	0.66	0.66	1.15	1.15	1.56	1.56
Nominal rotational speed	[rpm]	3000					
Max. rotational speed	[rpm]	7100	12500	6800	11800	6800	11900
Motor constant	[Nm/A]	0.41	0.41	0.45	0.45	0.44	0.44
Winding resistance	[Ω]	11.7	11.7	4.85	4.85	2.68	2.68
Winding inductance	[mH]	21	21	11	11	7	7
Total moment of inertia of drive output							
Without brake	[kgcm ²]	0.169	0.169	0.286	0.286	0.403	0.403
With brake	[kgcm ²]	0.257	0.257	0.373	0.373	0.490	0.490
Shaft load							
Radial	[N]	320					
Axial	[N]	65					
Brake							
Operating voltage	[V DC]	24 (+6 ... -10%)					
Power	[W]	11					
Holding torque (static)	[Nm]	2.5					
Mass moment of inertia	[kgcm ²]	0.074					

1) Operation is only tested and approved in combination with drive controllers from Festo. On 3-phase grids, operation up to 3x 400 VAC +10% is approved.

Weight [kg]			
Flange size		60	
Length		S	M
Without brake		1.18	1.53
With brake		1.50	1.85

Data sheet

Operating and environmental conditions	
Standard	IEC60034
Degree of protection	
Motor shaft	IP40
Motor housing incl. connection technology	IP67
With radial shaft seal	IP67
Ambient temperature [°C]	-15 ... +40 (up to 80°C with derating of -1.5% per degree Celsius)
Storage temperature [°C]	-20 ... +70
Temperature monitoring	Digital motor temperature transmission via EnDat® 2.2
Rating class to EN 60034-1	S1
Thermal class to EN 60034-1	F
Relative humidity [%]	0 ... 90
Corrosion resistance CRC ¹⁾	0
CE marking (see declaration of conformity)	To EU Low Voltage Directive To EU EMC Directive ²⁾ To EU RoHS Directive
Certification	c UL us - Recognized (OL) RCM compliance mark
Note on materials	RoHS-compliant Contains paint-wetting impairment substances

1) Corrosion resistance class CRC 0 to Festo standard FN 940070

No corrosion stress. Applies to small, visually irrelevant standard parts such as threaded pins, circlips and clamping sleeves which are usually only available on the market in a phosphated or burnished version (and possibly oiled) as well as to ball bearings (for components < CRC 3) and plain bearings.

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.

Technical data – Encoder		Absolute, single turn	Absolute, multi-turn
Measuring unit			
Operating voltage [V DC]	5		
Operating voltage range [V DC]	3.6 ... 14		
Protocol	EnDat 2.2, digital channel only, max. cycle rate (CLOCK) \leq 16 MHz		
Position values per revolution	262144	524288	
Rotor position encoder resolution	18 bit	19 bit	
Revolutions	-	4096 revolutions, 12 bits	

Pin allocation	PIN	Function
	1	BR- Brake
	2	-
	3	-
	4	BR+ Brake
	5	Up Encoder power supply
	6	0 V Encoder power supply
	7	Data + Encoder communication
	8	Data - Encoder communication
	9	CLK + Encoder communication
	10	CLK - Encoder communication
	A	U Motor power supply
	B	V Motor power supply
C	W Motor power supply	
D	-	
PE	PE Protective earth conductor	

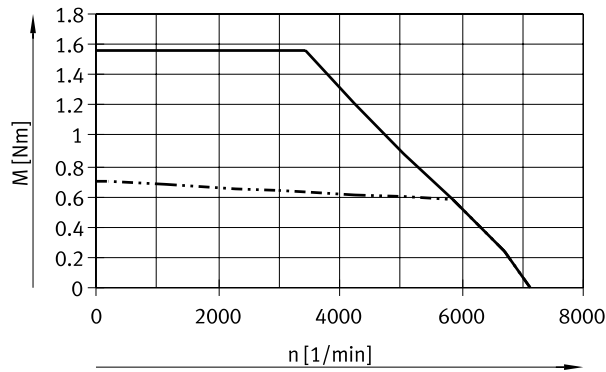
Data sheet

Torque M as a function of rotational speed n

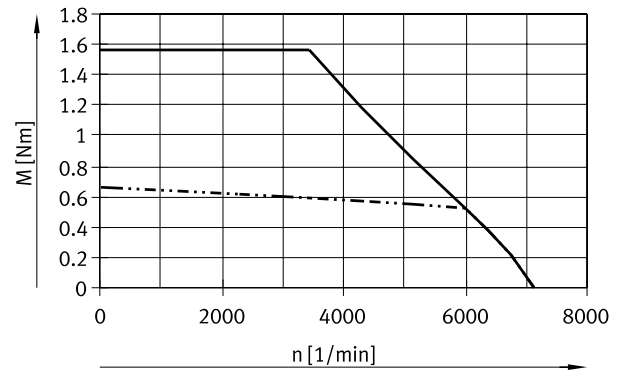
Flange size 60

Length S

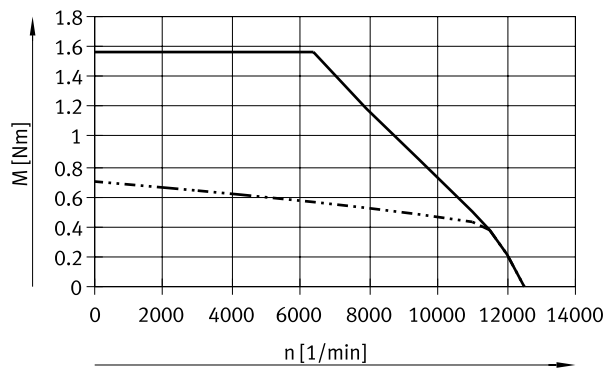
Winding LS (without brake)



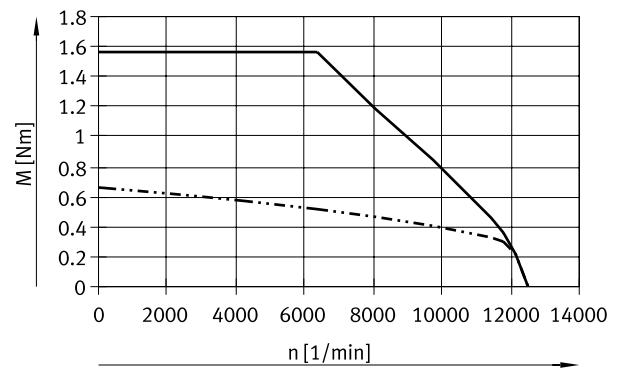
Winding LS-B (with brake)



Winding HS (without brake)

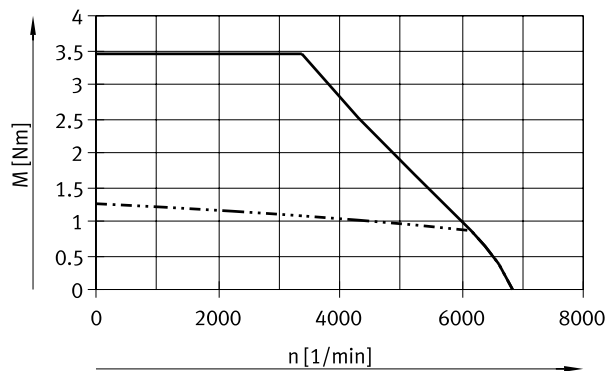


Winding HS-B (with brake)

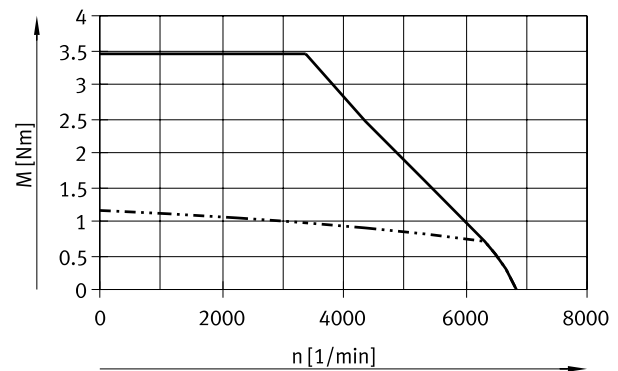


Length M


Winding LS (without brake)



Winding LS-B (with brake)



- Peak torque
- - - - - Nominal torque

 **Note**

Typical motor characteristic curve with nominal voltage and optimal motor controller.
Observe the maximum permissible rotational speeds of add-on and installation components (such as brake, encoder, etc.).

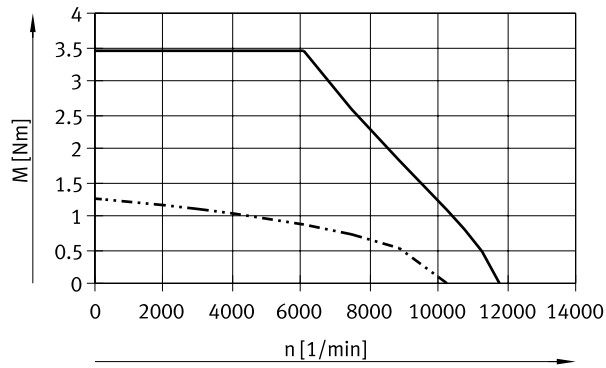
Data sheet

Torque M as a function of rotational speed n

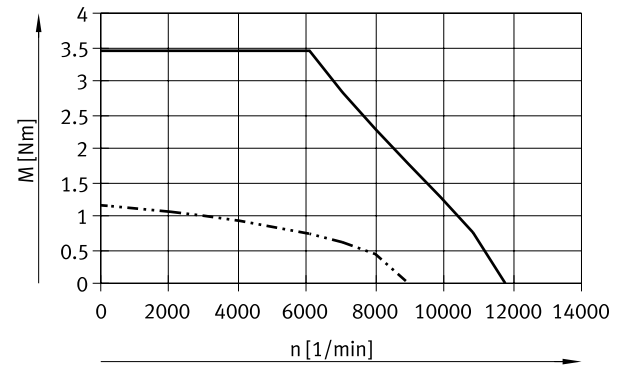
Flange size 60

Length M

Winding HS (without brake)

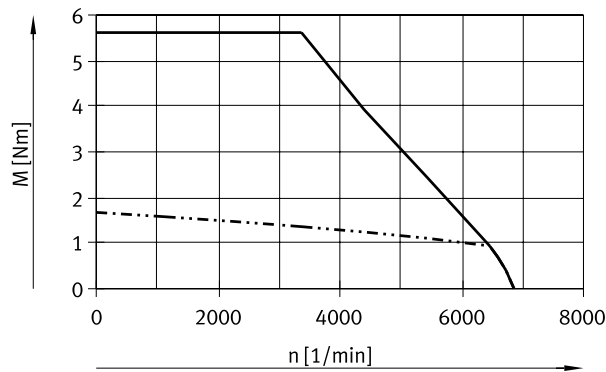


Winding HS-B (with brake)

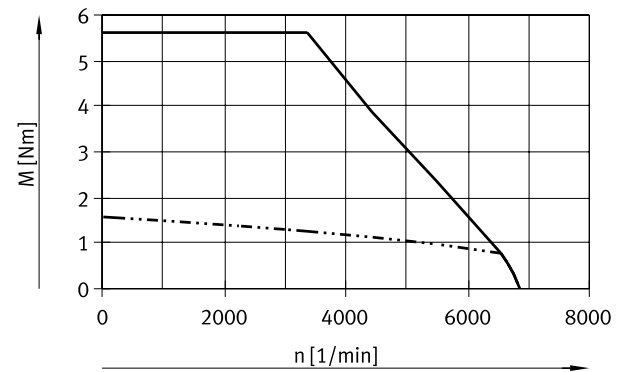


Length L

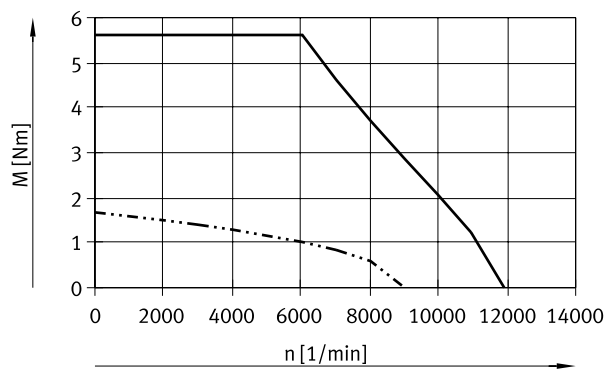
Winding LS (without brake)



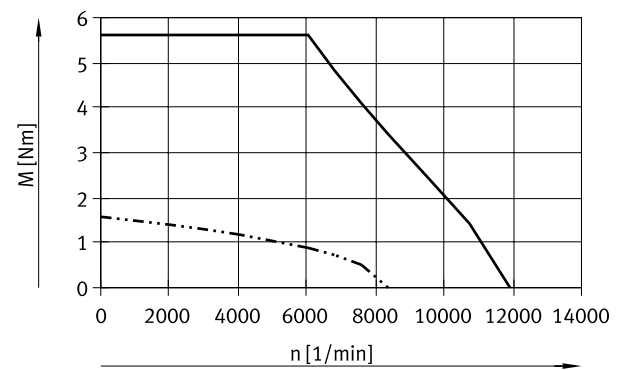
Winding LS-B (with brake)




Winding HS (without brake)



Winding HS-B (with brake)



— Peak torque
 - · · · · · Nominal torque

 Note

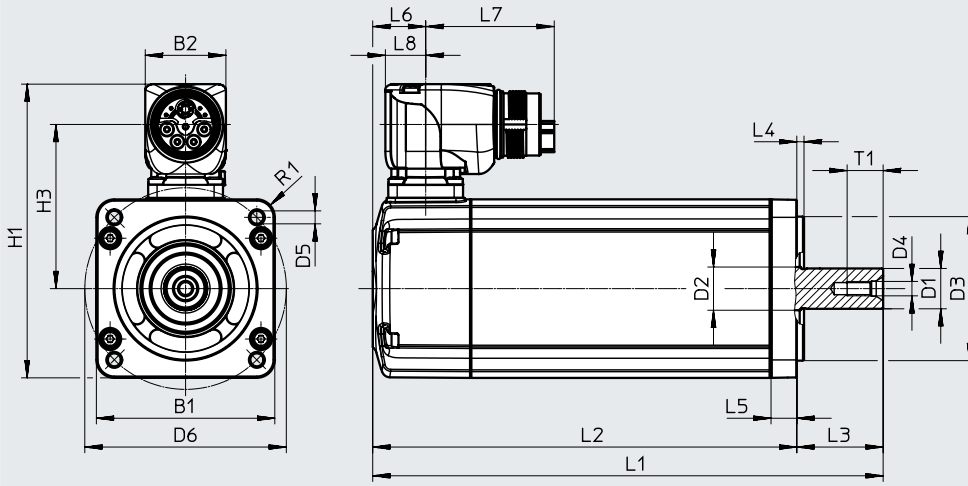
Typical motor characteristic curve with nominal voltage and optimal motor controller.

Observe the maximum permissible rotational speeds of add-on and installation components (such as brake, encoder, etc.).

Data sheet

Dimensions


Download CAD data → www.festo.com



Size	Length	B1	B2	D1 ∅ h6	D2 ∅	D3 ∅ h7	D4	D5 ∅
60	S	62	28	14	15	50	M5	4.3
	M							
	L							

Size	Length	D6 ∅ ±0.3	H1	H3	L1		L2	
						With brake	±2	With brake ±2
60	S	70	102	57	144.5	177.3	114.5	147.3
	M				164.5	197.3	134.5	167.3
	L				184.5	217.3	154.5	187.3

Size	Length	L3	L4	L5	L6	L7	L8	R1	T1
60		+0.5/-0.2	±0.2	±0.3					
	S	30	2.5	9	18.4	44.7	14	6	12.5
	M								
L									

 **Note**

Only motors without featherkey may be used in combination with parallel and axial kits (EAMM-U/EAMM-A).

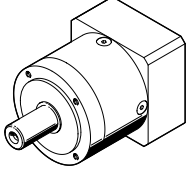
Data sheet


Ordering data								Part no.	Type
Length			Winding		Measuring unit		Brake		
Short	Medium	Long	Low voltage, standard	High voltage, standard	Encoder, single-turn	Encoder, multi-turn			
Flange size 60									
■			■		■			5242196	EMMT-AS-60-S-LS-RS
■			■			■		5242197	EMMT-AS-60-S-LS-RM
■			■		■		■	5242198	EMMT-AS-60-S-LS-RSB
■			■			■	■	5242199	EMMT-AS-60-S-LS-RMB
■				■	■			5242200	EMMT-AS-60-S-HS-RS
■				■		■		5242201	EMMT-AS-60-S-HS-RM
■				■	■		■	5242202	EMMT-AS-60-S-HS-RSB
■				■		■	■	5242203	EMMT-AS-60-S-HS-RMB
	■		■		■			5242204	EMMT-AS-60-M-LS-RS
	■		■			■		5242205	EMMT-AS-60-M-LS-RM
	■		■		■		■	5242206	EMMT-AS-60-M-LS-RSB
	■		■			■	■	5242207	EMMT-AS-60-M-LS-RMB
	■			■	■			5242208	EMMT-AS-60-M-HS-RS
	■			■		■		5242209	EMMT-AS-60-M-HS-RM
	■			■	■		■	5242210	EMMT-AS-60-M-HS-RSB
	■			■		■	■	5242211	EMMT-AS-60-M-HS-RMB
		■	■		■			5242212	EMMT-AS-60-L-LS-RS
		■	■			■		5242213	EMMT-AS-60-L-LS-RM
		■	■		■		■	5242214	EMMT-AS-60-L-LS-RSB
		■	■			■	■	5242215	EMMT-AS-60-L-LS-RMB
		■		■	■			5242216	EMMT-AS-60-L-HS-RS
		■		■		■		5242217	EMMT-AS-60-L-HS-RM
		■		■	■		■	5242218	EMMT-AS-60-L-HS-RSB
		■		■		■	■	5242219	EMMT-AS-60-L-HS-RMB

Ordering data – Modular product system

Ordering table				
Size	60	Conditions	Code	Enter code
Module no.	4808568			
Series	EMMT		EMMT	EMMT
Motor technology	AC synchronous		-AS	-AS
Motor flange size	60 mm		-60	-60
Length	Short		-S	
	Medium		-M	
	Long		-L	
Output shaft	Smooth shaft			
	Shaft to DIN 6885		K	
Radial shaft seal	None			
	With standard shaft seal		R	
Winding	Low voltage, standard		-LS	
	High voltage, standard		-HS	
Electrical connection	Angled plug, rotatable		-R	-R
Measuring unit	Absolute encoder, single turn		S	
	Absolute encoder, multi turn		M	
Brake	None			
	With brake		B	

Accessories

Ordering data – Gear unit				Data sheets → Internet: emga
	Motor interface	Gear ratio	Part no.	Type
	60P	3	2297686	EMGA-60-P-G3-EAS-60
		5	2297687	EMGA-60-P-G5-EAS-60

Ordering data – Radial shaft seal				
	Description	Weight [g]	Part no.	Type
	<ul style="list-style-type: none"> • Protection to IP67 is achieved in combination with the sealing ring • Based on the operating conditions, the shaft seal must be replaced after 5000 operating hours at the latest • Information on installation/replacement → www.festo.com/sp 	13	8079786	EASS-RS-T-A-4P-15-30-B7

Accessories

Recommended cable cross section at an ambient temperature of 40°C as a function of cable length and max. motor current

Up to 5 m Up to 10 m Up to 20 m Up to 30 m Up to 40 m Up to 50 m Up to 75 m Up to 100 m

EMMT-AS-60-...

- 0.75 mm²
- 1.5 mm²

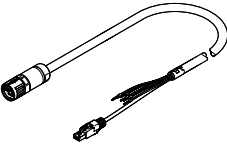
Note

Depending on the drive controller used, the max. cable lengths may also be shorter.

Technical data – Motor cables

For motor	EMMT-AS-60	
Type	NEBM-M23G15-...	
Cable composition	4x 0.75 mm ² + 1x (2x 0.75 mm ²) + 1x (2x 0.24 mm ² + 2x2x0.15 mm ²)	
	Shielded	
Degree of contamination	1	
Min. bending radius		
For fixed cable installation	[mm]	≥ 48
With flexible cable installation	[mm]	≥ 90
Ambient temperature		
For fixed cable installation	[°C]	-40 ... +90
With flexible cable installation	[°C]	-25 ... +80
Cable characteristics	Suitable for energy chains	
Degree of protection	IP67 (in mounted state)	
Material	TPE-U (PUR)	
Note on materials	RoHS-compliant	
CE marking (see declaration of conformity)	To EU Low Voltage Directive	

Ordering data – Motor cable

	Cable length [m]	Part no.	Type
	2.5	5251374	NEBM-M23G15-EH-2.5-Q7N-R3LEG14
	5	5251375	NEBM-M23G15-EH-5-Q7N-R3LEG14
	7.5	5251376	NEBM-M23G15-EH-7.5-Q7N-R3LEG14
	10	5251377	NEBM-M23G15-EH-10-Q7N-R3LEG14
	15	5251378	NEBM-M23G15-EH-15-Q7N-R3LEG14
	20	5251379	NEBM-M23G15-EH-20-Q7N-R3LEG14
	X length ¹⁾	5251373	NEBM-M23G15-EH-...-Q7N-R3LEG14

1) Choice of cable lengths: 0.5 ... 99.9 m, in increments of 0.1 m.

Note

Cable lengths > 25 m possible following technical consultation.
In the case of motors with a holding brake, the max. cable length is 50 m.