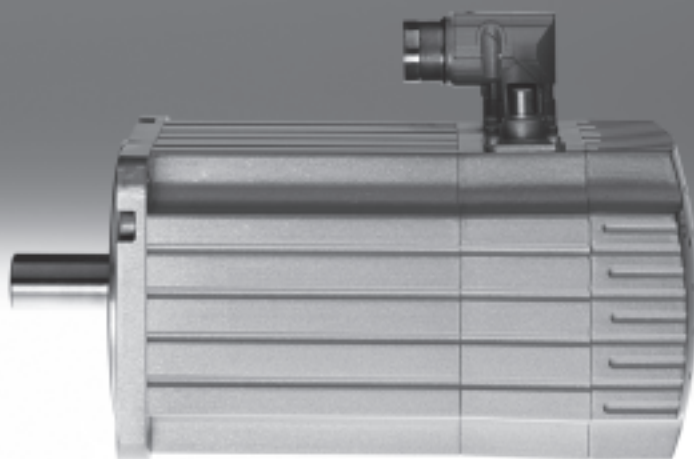


Servo motors EMMS-AS

FESTO



Servo motors EMMS-AS

Key features

FESTO

Everything from a single source

Motors EMMS-AS

→ 4



- Permanently excited, electro-dynamic, brushless servo motor
- Choice of two encoder types:
 - Digital single-turn absolute displacement encoder (standard)
 - Digital multi-turn absolute displacement encoder (optional)
- Optionally with holding brake
- Protection class:
 - IP54 (motor shaft)
 - IP65 (motor housing with connection technology)
- Optimised connection technology:
 - With size 40, 55: Terminal connection
 - With size 70, 100, 140: Round plug: M23 power connection, rotatable M12 encoder connection

Gear unit EMGA-SAS

→ 12



- Planetary gear unit
- Gear unit ratio $i = 3$ and 5, available ex-stock
- Further designs and gear ratios on request
- Life time lubrication
- Protection class: IP54

Motor controller CMMP-AS

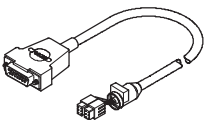
→ Internet: cmm-as



- Digital servo controller in 4 performance classes (0.5 kVA ... 6 kVA)
- Actuation of AC servo and linear motors
- Integrated EMC filters
- Integrated brake chopper
- Integrated safety functions
- Position controller with closed-loop position control (256 position sets)
- Speed controller
- Torque control via current controller
- Range of control functions
- Interfaces:
 - I/O interface
 - CANopen, standard
 - Profibus DP, optional module
 - DeviceNet, optional module
 - Sercos 2, optional module

Motor and encoder cables NEBM

→ 14



- Can be used in a wide temperature range
- Suitable for chain link trunking
- Protection class IP65

Axial and parallel kits EAMM

→ Internet: eam



- Specified kits for all electro-mechanical axes from Festo
- Each kit includes the relevant necessary coupling housing, couplings and motor flange as well as all screws

Servo motors EMMS-AS

Type codes

		EMMS	–	AS	–	70	–	S	–	RMB
Type										
EMMS	Motor									
Motor type										
AS	Servo motor									
Flange dimensions										
40	40 mm									
55	55 mm									
70	70 mm									
100	100 mm									
140	140 mm									
Overall length options										
S	Small									
M	Medium									
Additional function										
T	Terminal connection									
R	Round plug									
S	Single turn									
M	Multi-turn									
B	Brake									

Servo motors EMMS-AS

Technical data

FESTO



General technical data			
Size		40	55
Motor			
Nominal voltage	[V DC]	360	360
Nominal current	[A]	0.6	1.2
Peak current	[A]	3.3	5
Rated output	[W]	222	467
Nominal torque	[Nm]	0.2	0.68
Peak torque	[Nm]	1	2.7
Torque at standstill	[Nm]	0.26	0.98
Nominal speed	[1/min]	10,300	6,600
Max. speed	[1/min]	11,180	7,330
Motor constant	[Nm/A]	0.344	0.558
Winding resistance	[Ω]	34.833	14.35
Winding inductance	[mH]	10.36	13.83
Drive mass moment of inertia	[kgcm ²]	0.054	0.223
Drive mass moment of inertia with brake	[kgcm ²]	0.064	0.245
Radial load on shaft	[N]	82	150
Axial load on shaft	[N]	12	75
Brake			
Operating voltage	[V DC]	24 +6 ... -10%	24 +6 ... -10%
Output	[W]	6.2	10
Holding torque	[Nm]	0.4	0.8
Mass moment of inertia	[kgcm ²]	0.01	0.022

Size		70-S	70-M
Motor			
Nominal voltage	[V DC]	360	360
Nominal current	[A]	2.2	2.6
Peak current	[A]	5	10
Rated output	[W]	866	1 061
Nominal torque	[Nm]	1.43	2.29
Peak torque	[Nm]	3.1	7.75
Torque at standstill	[Nm]	1.64	2.56
Nominal speed	[1/min]	5,300	4,100
Max. speed	[1/min]	6,300	4,780
Motor constant	[Nm/A]	0.647	0.864
Winding resistance	[Ω]	7.66	6.71
Winding inductance	[mH]	0.015	0.013
Drive mass moment of inertia	[kgcm ²]	0.379	0.611
Drive mass moment of inertia with brake	[kgcm ²]	0.449	0.68
Radial load on shaft	[N]	150	200
Axial load on shaft	[N]	75	75
Brake			
Operating voltage	[V DC]	24 +6 ... -10%	24 +6 ... -10%
Output	[W]	11	11
Holding torque	[Nm]	2	2
Mass moment of inertia	[kgcm ²]	0.071	0.073

Servo motors EMMS-AS

Technical data

General technical data				
Size		100-S		100-M
Motor				
Nominal voltage	[V DC]	360	565	565
Nominal current	[A]	3.8	3.3	3.4
Peak current	[A]	10	15	15
Rated output	[W]	1,497	1,573	2,015
Nominal torque	[Nm]	3.76	3.24	5.69
Peak torque	[Nm]	9.2	12.5	22.1
Torque at standstill	[Nm]	4.71		8.09
Nominal speed	[1/min]	3,500	4,600	3,400
Max. speed	[1/min]	4,130	5,950	3,750
Motor constant	[Nm/A]	0.984		1.652
Winding resistance	[Ω]	2.92		3.18
Winding inductance	[mH]	0.009		0.111
Drive mass moment of inertia	[kgcm ²]	2.529		4.729
Drive mass moment of inertia with brake	[kgcm ²]	3.085		5.285
Radial load on shaft	[N]	300		570
Axial load on shaft	[N]	150		150
Brake				
Operating voltage	[V DC]	24 +6 ... -10%		24 +6 ... -10%
Output	[W]	18		18
Holding torque	[Nm]	9		9
Mass moment of inertia	[kgcm ²]	0.555		0.555

Size		140-S	140-M
Motor			
Nominal voltage	[V DC]	565	565
Nominal current	[A]	4.4	7.4
Peak current	[A]	15	20
Rated output	[W]	2,663	4,827
Nominal torque	[Nm]	9.55	20.05
Peak torque	[Nm]	25.6	48.8
Torque at standstill	[Nm]	11.32	25.48
Nominal speed	[1/min]	2,600	2,000
Max. speed	[1/min]	2,930	2,210
Motor constant	[Nm/A]	2.166	2.72
Winding resistance	[Ω]	3.31	1.442
Winding inductance	[mH]	0.02	0.013
Drive mass moment of inertia	[kgcm ²]	8.189	19.027
Drive mass moment of inertia with brake	[kgcm ²]	9.271	20.108
Radial load on shaft	[N]	780	1,060
Axial load on shaft	[N]	200	200
Brake			
Operating voltage	[V DC]	24 +6 ... -10%	24 +6 ... -10%
Output	[W]	15.6	15.6
Holding torque	[Nm]	18	18
Mass moment of inertia	[kgcm ²]	1.082	1.082

Servo motors EMMS-AS

Technical data

FESTO

Technical data – Encoder		
Type	EMMS-AS-...-...S... Absolute, single turn	EMMS-AS-...-...M... Absolute, multi-turn
Digital encoder, inductive		
Operating voltage [V DC]	5	
Protocol	EnDat 2.2	
Version	Standard	Optional
Resolution	262,144 position values within one revolution (360°), 18 bit	
	–	– 4,096 revolutions, 12 bit – Battery-free system

Weight [g]								
Size	40	55	70-S	70-M	100-S	100-M	140-S	140-M
Product weight	1,000	1,600	2,100	2,700	4,800	6,900	9,600	16,200
With brake	1,050	1,700	2,300	2,900	5,300	7,500	10,400	17,000

Operating and environmental conditions	
Protection class: motor shaft	IP54
Protection class: motor housing with connection technology	IP65
Ambient temperature [°C]	–10 ... +40 (up to 130 °C with derating)
Storage temperature [°C]	–20 ... +60
Insulation protection class	F
Rated class to EN 60034-1	S1
Heat class to EN 60034-1	F
Relative air humidity [%] (non-condensing)	0 ... 90
Corrosion resistance class CRC ¹⁾	2
CE symbol (see declaration of conformity)	To EU Low Voltage Directive To EU EMC Directive
Certification	C-UL-US recognised (OL) C-Tick

- 1) Corrosion resistance class 2 to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.

Servo motors EMMS-AS

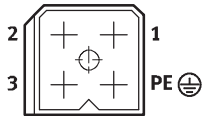
Technical data

Pin allocation

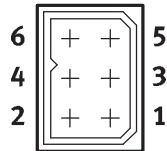
Sizes 40, 55

Motor, output

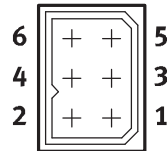
Black plug	Encoder	Encoder	Temperature sensor (PTC) and holding brake
Red plug	Yellow plug	Blue plug	



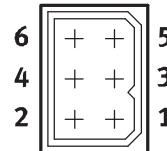
PIN	Function
1	Phase V
2	Phase W
3	Phase U
PE	PE (protective earth)



PIN	Function
1	DATA
2	DATA/
3	0 V
4	UP
5	CLOCK
6	CLOCK/



PIN	Function
1	-SENS
2	+SENS
3	-
4	-
5	-
6	-

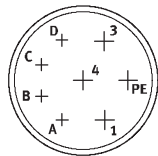


PIN	Function
1	Temperature sensor M _T +
2	Temperature sensor M _T -
3	Holding brake BR+
4	Holding brake BR-
5	-
6	-

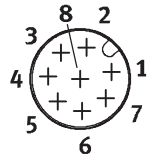
Sizes 70, 100, 140

Motor

Encoder



PIN	Function
1	Phase U
PE	PE (protective earth)
3	Phase W
4	Phase V
A	Temperature sensor M _T +
B	Temperature sensor M _T -
C	Holding brake BR+
D	Holding brake BR-



PIN	Function
1	-SENS
2	+SENS
3	DATA
4	DATA/
5	0 V
6	CLOCK/
7	CLOCK
8	UP

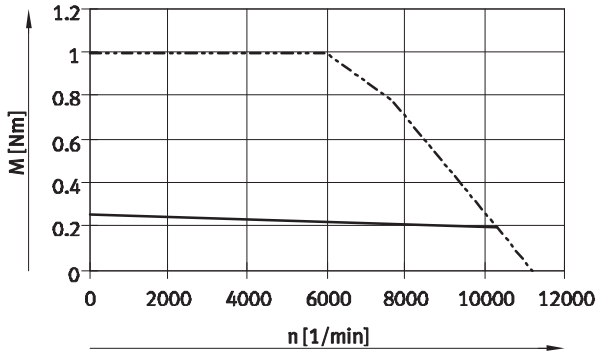
Servo motors EMMS-AS

Technical data

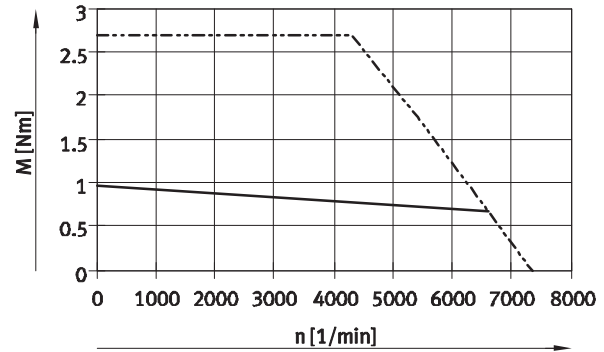
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Torque M as a function of rotational speed n

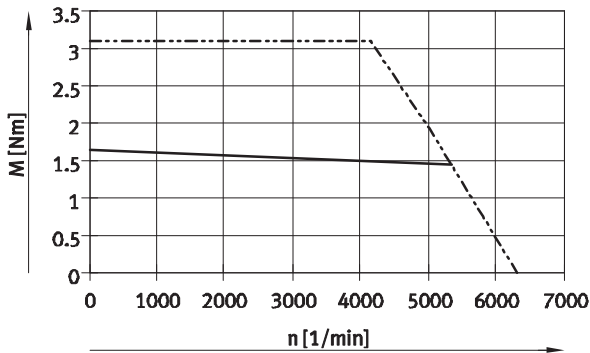
EMMS-AS-40-M (intermediate circuit voltage = 360 V)



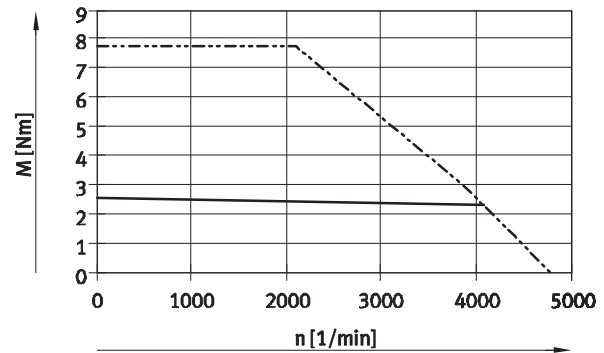
EMMS-AS-55-S (intermediate circuit voltage = 360 V)



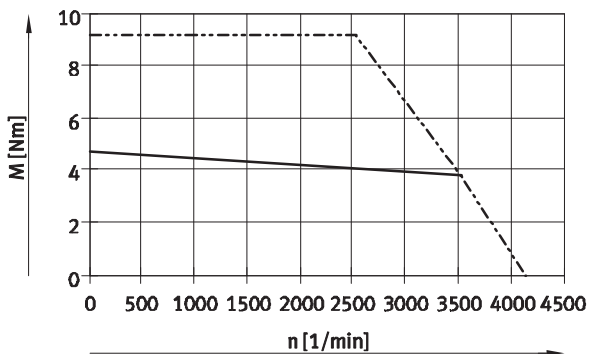
EMMS-AS-70-S (intermediate circuit voltage = 360 V)



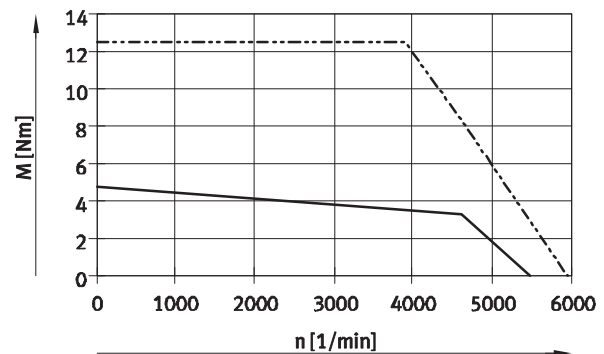
EMMS-AS-70-M (intermediate circuit voltage = 360 V)



EMMS-AS-100-S (intermediate circuit voltage = 360 V)



EMMS-AS-100-S (intermediate circuit voltage = 565 V)



— Rated torque
- - - Peak torque

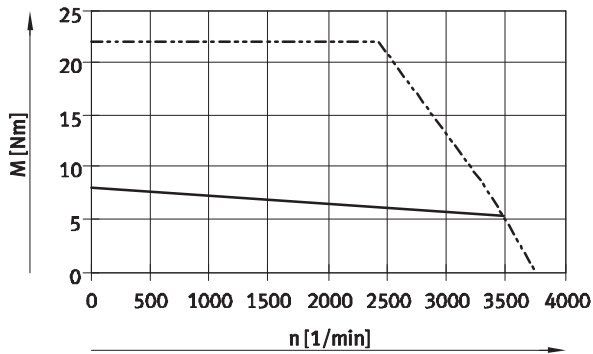
Servo motors EMMS-AS

Technical data

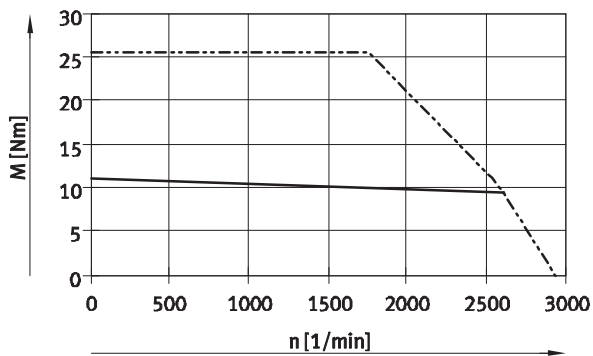
FESTO

Torque M as a function of rotational speed n

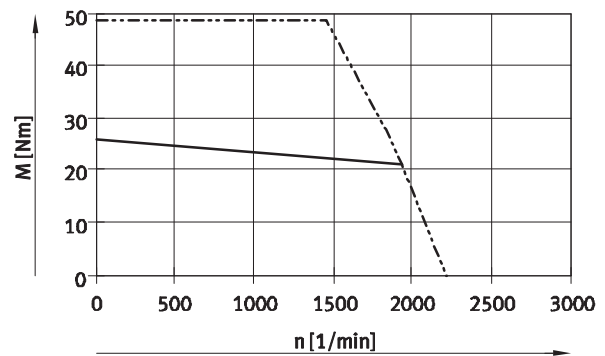
EMMS-AS-100-M (intermediate circuit voltage = 565 V)



EMMS-AS-140-S (intermediate circuit voltage = 565 V)



EMMS-AS-140-M (intermediate circuit voltage = 565 V)



— Rated torque
- - - Peak torque

Servo motors EMMS-AS

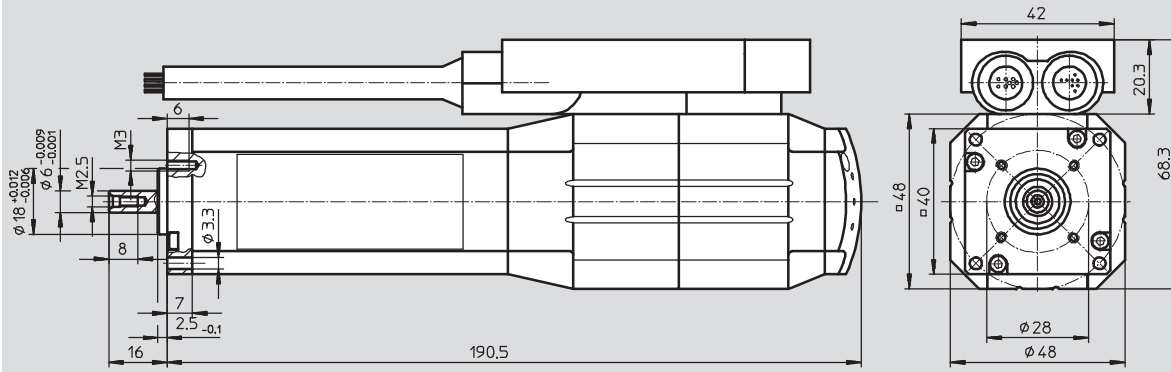
Technical data

FESTO

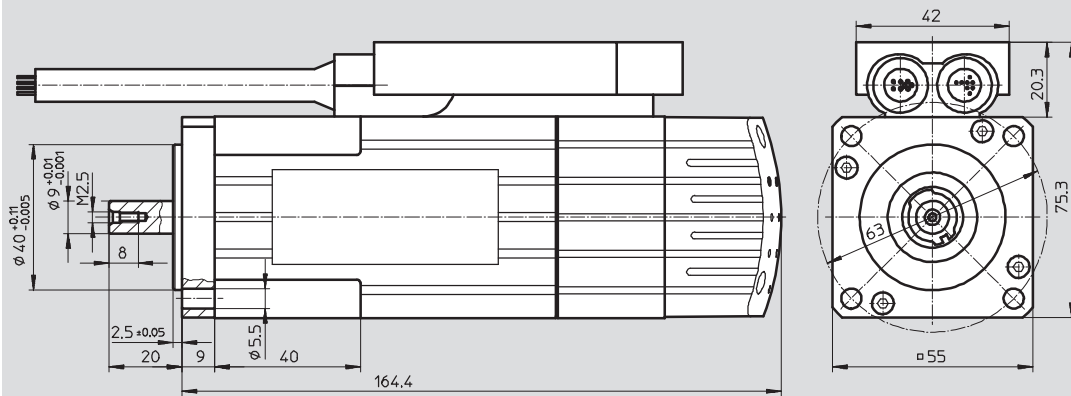
Dimensions

Download CAD data → www.festo.com

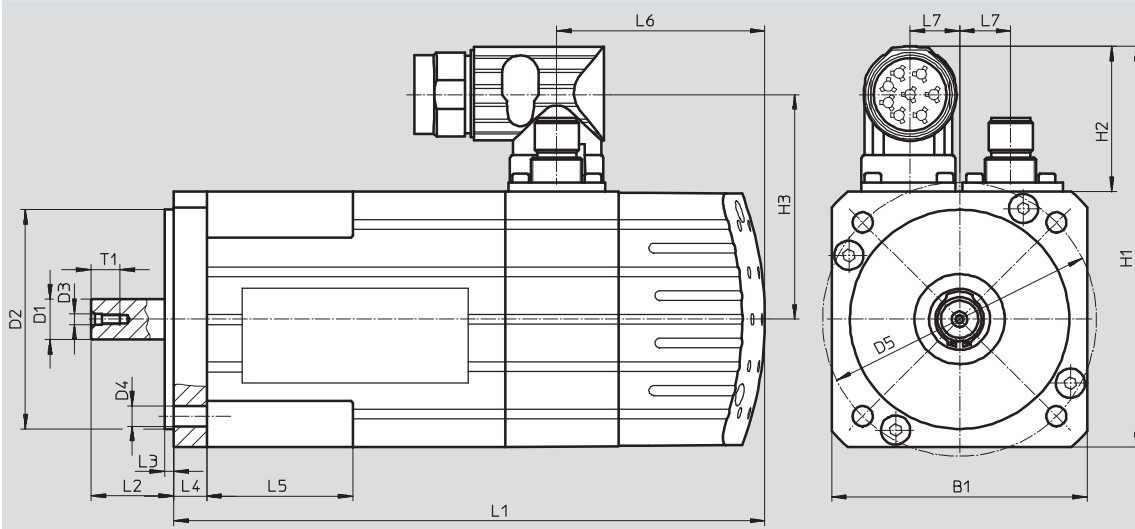
Size 40



Size 55



Sizes 70, 100, 140



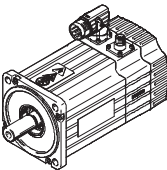
Servo motors EMMS-AS

Technical data

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Size	Type	B1	D1 Ø	D2 Ø	D3	D4 Ø	D5 Ø	H1	H2
70	EMMS-AS-70-S	70	11	60	M2.5	5.5	75	109.5	39.5
	EMMS-AS-70-M		+0.012/+0.001	+0.012/+0.007					
100	EMMS-AS-100-S	100.5	19	95	M4	9.2	115	140	
	EMMS-AS-100-M		+0.015/+0.002	+0.013/-0.009					
140	EMMS-AS-140-S	140.5	24	130	M4	11.3	165	180	
	EMMS-AS-140-M		+0.015/+0.002	+0.018/-0.007					

Size	Type	H3	L1	L2	L3	L4	L5	L6	L7	T1
70	EMMS-AS-70-S	61.5	161.8	22.7	2.5 _{-0.1}	9	40	57	14	8
	EMMS-AS-70-M		187.3							
100	EMMS-AS-100-S	77	192.3	40	3	9.8	-	58.9	19	16
	EMMS-AS-100-M		243.3							
140	EMMS-AS-140-S	97.7	209	50	3.5	12.2	-	58.6	33.5	16
	EMMS-AS-140-M		285.5							

Ordering data										
	Size	Variant					Part No.	Type		
		Single turn	Multi-turn	With brake	Small	Medium				
	40	☒					☒	550 106	EMMS-AS-40-M-TS	
			☒					☒	550 107	EMMS-AS-40-M-TM
		☒		☒				☒	550 108	EMMS-AS-40-M-TSB
			☒	☒				☒	550 109	EMMS-AS-40-M-TMB
	55	☒				☒			550 110	EMMS-AS-55-S-TS
			☒			☒			550 111	EMMS-AS-55-S-TM
		☒		☒		☒			550 112	EMMS-AS-55-S-TSB
			☒	☒		☒			550 113	EMMS-AS-55-S-TMB
	70	☒				☒			550 114	EMMS-AS-70-S-RS
			☒			☒			550 115	EMMS-AS-70-S-RM
		☒		☒		☒			550 116	EMMS-AS-70-S-RSB
			☒	☒		☒			550 117	EMMS-AS-70-S-RMB
		☒					☒		550 118	EMMS-AS-70-M-RS
			☒				☒		550 119	EMMS-AS-70-M-RM
				☒			☒		550 120	EMMS-AS-70-M-RSB
			☒	☒			☒		550 121	EMMS-AS-70-M-RMB
	100	☒				☒			550 122	EMMS-AS-100-S-RS
			☒			☒			550 123	EMMS-AS-100-S-RM
		☒		☒		☒			550 124	EMMS-AS-100-S-RSB
			☒	☒		☒			550 125	EMMS-AS-100-S-RMB
		☒					☒		550 127	EMMS-AS-100-M-RS
			☒				☒		550 128	EMMS-AS-100-M-RM
				☒			☒		550 129	EMMS-AS-100-M-RSB
			☒	☒			☒		550 130	EMMS-AS-100-M-RMB
	140	☒				☒			550 131	EMMS-AS-140-S-RS
			☒			☒			550 132	EMMS-AS-140-S-RM
		☒		☒		☒			550 133	EMMS-AS-140-S-RSB
			☒	☒		☒			550 134	EMMS-AS-140-S-RMB
		☒					☒		550 135	EMMS-AS-140-M-RS
			☒				☒		550 136	EMMS-AS-140-M-RM
		☒		☒			☒		550 137	EMMS-AS-140-M-RSB
			☒	☒			☒		550 138	EMMS-AS-140-M-RMB

Servo motors EMMS-AS

Accessories

FESTO

Gear unit EMGA



General technical data									
For motor size		40		55		70			
Gear unit type		EMGA-40-P-G...-40		EMGA-60-P-G...-55		EMGA-60-P-G...-70		EMGA-80-P-G...-70	
Gear unit ratio		3:1	5:1	3:1	5:1	3:1	5:1	3:1	5:1
Continuous driving torque ¹⁾	[Nm]	11	14	22	22	22	22	85	110
Max. driving torque ²⁾	[Nm]	17.6	22	22	22	22	22	136	176
Torsional resistance	[Nm/arcmin]	1		2.3		2.3		6	
Torsional backlash	[deg]	0.4		0.27		0.27		0.15	
Moment of inertia ³⁾	[kgcm ²]	0.031	0.19	0.135	0.078	0.135	0.078	0.77	0.45
Efficiency	[%]	96							
Operating temperature ⁴⁾	[°C]	-25 ... +90							
Protection class		IP54							

For motor size		100		100		140			
Gear unit type		EMGA-80-P-G...-100		EMGA-120-P-G...-100		EMGA-120-P-G...-140		EMGA-160-P-G...-140	
Gear unit ratio		3:1	5:1	3:1	5:1	3:1	5:1	3:1	5:1
Continuous driving torque ¹⁾	[Nm]	85	110	115	195	115	195	400	450
Max. driving torque ²⁾	[Nm]	136	176	184	213	184	213	640	720
Torsional resistance	[Nm/arcmin]	6		12		12		38	
Torsional backlash	[deg]	0.15		0.13		0.13		0.1	
Moment of inertia ³⁾	[kgcm ²]	0.77	0.45	2.63	1.53	2.63	1.53	12.14	6.07
Efficiency	[%]	96							
Operating temperature ⁴⁾	[°C]	-25 ... +90							
Protection class		IP54							

- 1) At the drive shaft
2) The specifications refer to a drive 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

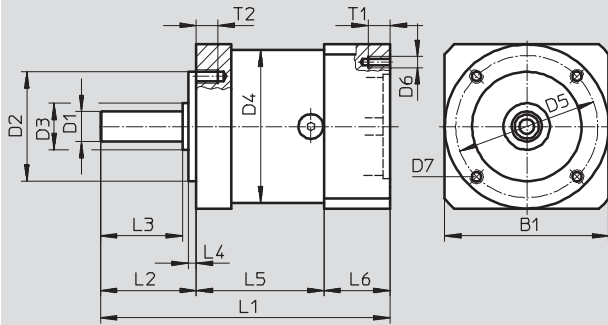
Servo motors EMMS-AS

Accessories

FESTO

Dimensions

Download CAD data → www.festo.com



Type	B1	D1 Ø h7	D2 Ø h7	D3 Ø	D4 Ø	D5 Ø	D6	D7
EMGA-40-P-G...-40	40	10	26	12	40	34	M3	M4
EMGA-60-P-G...-55	60	11	40	17	60	52	M5	M5
EMGA-60-P-G...-70	70	11	40	17	60	52	M5	M5
EMGA-80-P-G...-70	80	20	60	25	80	70	M5	M6
EMGA-80-P-G...-100	100	20	60	25	80	70	M8	M6
EMGA-120-P-G...-100	115	25	80	35	115	100	M8	M10
EMGA-120-P-G...-140	140	25	80	35	115	100	M10	M10
EMGA-160-P-G...-140	140	40	130	55	160	145	M10	M12

Type	L1	L2	L3 ±0.2	L4 ±0.2	L5	L6	T1	T2
EMGA-40-P-G...-40	88.5±1.5	26±0.6	12	2	39	23.5	6	6
EMGA-60-P-G...-55	106±1.5	35±0.8	30	3	47	24	12	8
EMGA-60-P-G...-70	106±1.5	35±0.8	30	3	47	24	12	8
EMGA-80-P-G...-70	133.5±1.5	40±0.8	36	3	60	33.5	12	10
EMGA-80-P-G...-100	143.5±1.5	40±0.8	36	3	60	43.5	16	10
EMGA-120-P-G...-100	176.5±2	55±0.8	50	4	74	47.5	20	16
EMGA-120-P-G...-140	186±2	55±0.8	50	4	74	57.5	25	16
EMGA-160-P-G...-140	255.5±2	87±0.8	80	5	104	64.5	25	20

Ordering data

For size	Gear unit ratio	Part No.	Type
40	3	552 186	EMGA-40-P-G3-SAS-40
	5	552 187	EMGA-40-P-G5-SAS-40
55	3	552 188	EMGA-60-P-G3-SAS-55
	5	552 189	EMGA-60-P-G5-SAS-55
70	3	552 190	EMGA-60-P-G3-SAS-70
	5	552 191	EMGA-60-P-G5-SAS-70
	3	552 192	EMGA-80-P-G3-SAS-70
	5	552 193	EMGA-80-P-G5-SAS-70
100	3	552 194	EMGA-80-P-G3-SAS-100
	5	552 195	EMGA-80-P-G5-SAS-100
	3	552 196	EMGA-120-P-G3-SAS-100
	5	552 197	EMGA-120-P-G5-SAS-100
140	3	552 198	EMGA-120-P-G3-SAS-140
	5	552 199	EMGA-120-P-G5-SAS-140
	3	552 200	EMGA-160-P-G3-SAS-140
	5	552 201	EMGA-160-P-G5-SAS-140

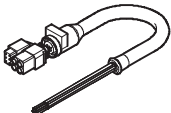
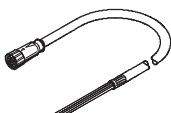
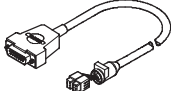
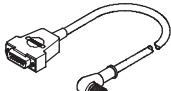
Servo motors EMMS-AS

Accessories

FESTO

Technical data – Cables				
Designation	Motor cable		Encoder cable	
For size	EMMS-AS-40/55	EMMS-AS-70/100/140	EMMS-AS-40/55	EMMS-AS-70/100/140
Type	NEBM-T1G7-...	NEBM-M23G6-...	NEBM-T1G8-...	NEBM-M12W8-...
Plug colour/PIN	Black Blue	1 ... 4 A ... D	Yellow Red	1 ... 8
Degree of contamination	3			
Min. bending radius [mm]	55	64	75	75
Ambient temperature [°C]	-50 ... +90	-50 ... +90	-40 ... +80	-40 ... +80
Ambient temperature ¹⁾ [°C]	-40 ... +90	-40 ... +90	-10 ... +80	-10 ... +80
Cable design	Screened			
Cable attribute	Suitable for chain link trunking			
Protection class	IP65			
Material	Polyurethane			
CE mark (see declaration of conformity)	To EU Low Voltage Directive		–	

1) With flexible cable installation

Ordering data			
	Cable length [m]	Part No.	Type
Motor cable			
	For EMMS-AS-40/55		
	5	550 306	NEBM-T1G7-E-5-N-LE7
	10	550 307	NEBM-T1G7-E-10-N-LE7
	15	550 308	NEBM-T1G7-E-15-N-LE7
	X length ¹⁾	550 309	NEBM-T1G7-E- -N-LE7
	For EMMS-AS-70/100/140		
	5	550 310	NEBM-M23G6-E-5-N-LE7
	10	550 311	NEBM-M23G6-E-10-N-LE7
	15	550 312	NEBM-M23G6-E-15-N-LE7
	X length ¹⁾	550 313	NEBM-M23G6-E- -N-LE7
Encoder cable			
	For EMMS-AS-40/55		
	5	550 314	NEBM-T1G8-E-5-N-S1G15
	10	550 315	NEBM-T1G8-E-10-N-S1G15
	15	550 316	NEBM-T1G8-E-15-N-S1G15
	X length ¹⁾	550 317	NEBM-T1G8-E- -N-S1G15
	For EMMS-AS-70/100/140		
	5	550 318	NEBM-M12W8-E-5-N-S1G15
	10	550 319	NEBM-M12W8-E-10-N-S1G15
	15	550 320	NEBM-M12W8-E-15-N-S1G15
	X length ¹⁾	550 321	NEBM-M12W8-E- -N-S1G15

1) Max. 25 m