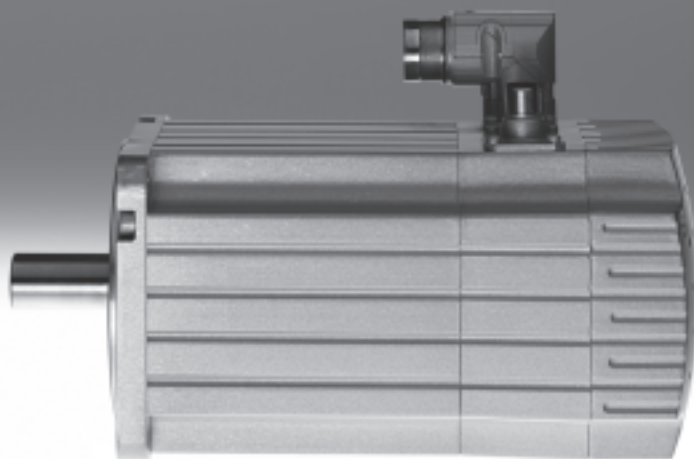


Servo motors EMMS-AS

FESTO



Servo motors EMMS-AS

Key features

FESTO

Everything from a single source

Motors EMMS-AS

→ 4



- Permanently excited, electrodynamic, 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

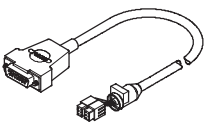
→ Internet: cmmp-as



- 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: eamm



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

Servo motors EMMS-AS

FESTO

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

FESTO

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 2.1, only digital channel, max. stroke frequency (CLOCK) 2 MHz	
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

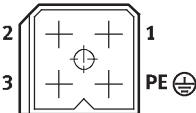
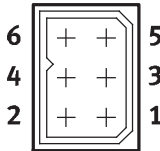
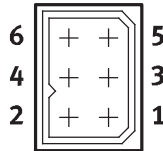
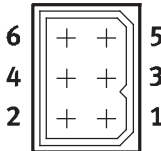
Operating and environmental conditions	
Protection class: motor shaft	IP54
Protection class: motor housing with connection technology	IP65
Ambient temperature	[°C] –10 ... +40 (up to 130 °C with derating)
Storage temperature	[°C] –20 ... +60
Insulation protection class	F
Rated class to EN 60034-1	S1
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 ²⁾
Certification	C-UL-US recognised (OL) C-Tick

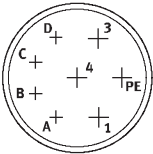
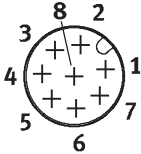
- 1) Corrosion resistance class 2 to Festo standard 940 070
Components subject to moderate corrosion stress. Externally visible parts with primarily decorative surface requirements which are in direct contact with a normal industrial environment or media such as coolants or lubricating agents.
- 2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com → Support → User documentation.
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 EMMS-AS

Technical data

FESTO

Pin allocation																																																											
Sizes 40, 55																																																											
Motor, output	Encoder	Encoder	Temperature sensor (PTC) and holding brake																																																								
Black plug	Red plug	Yellow plug	Blue plug																																																								
																																																											
<table><tr><th>PIN</th><th>Function</th></tr><tr><td>1</td><td>Phase V</td></tr><tr><td>2</td><td>Phase W</td></tr><tr><td>3</td><td>Phase U</td></tr><tr><td>PE</td><td>PE (protective earth)</td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>	PIN	Function	1	Phase V	2	Phase W	3	Phase U	PE	PE (protective earth)					<table><tr><th>PIN</th><th>Function</th></tr><tr><td>1</td><td>DATA</td></tr><tr><td>2</td><td>DATA/</td></tr><tr><td>3</td><td>0 V</td></tr><tr><td>4</td><td>UP</td></tr><tr><td>5</td><td>CLOCK</td></tr><tr><td>6</td><td>CLOCK/</td></tr></table>	PIN	Function	1	DATA	2	DATA/	3	0 V	4	UP	5	CLOCK	6	CLOCK/	<table><tr><th>PIN</th><th>Function</th></tr><tr><td>1</td><td>–SENS</td></tr><tr><td>2</td><td>+SENS</td></tr><tr><td>3</td><td>–</td></tr><tr><td>4</td><td>–</td></tr><tr><td>5</td><td>–</td></tr><tr><td>6</td><td>–</td></tr></table>	PIN	Function	1	–SENS	2	+SENS	3	–	4	–	5	–	6	–	<table><tr><th>PIN</th><th>Function</th></tr><tr><td>1</td><td>Temperature sensor M_T+</td></tr><tr><td>2</td><td>Temperature sensor M_T–</td></tr><tr><td>3</td><td>Holding brake BR+</td></tr><tr><td>4</td><td>Holding brake BR–</td></tr><tr><td>5</td><td>–</td></tr><tr><td>6</td><td>–</td></tr></table>	PIN	Function	1	Temperature sensor M _T +	2	Temperature sensor M _T –	3	Holding brake BR+	4	Holding brake BR–	5	–	6	–
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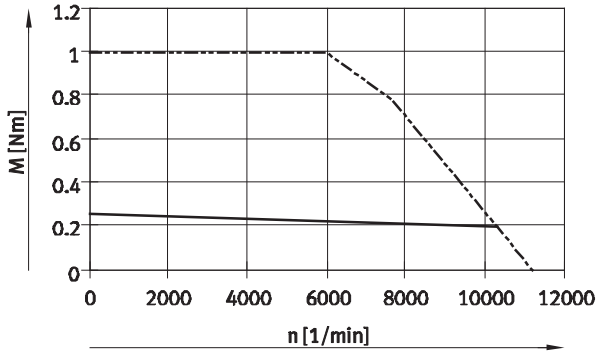
Servo motors EMMS-AS

Technical data

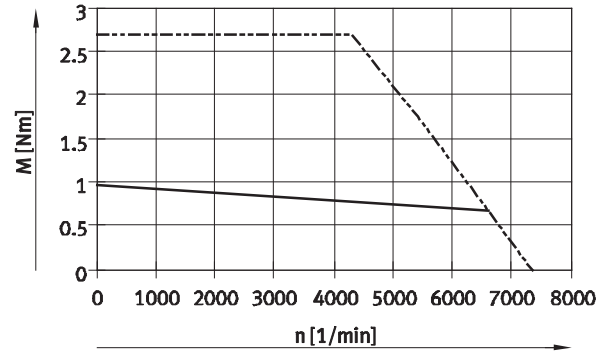
FESTO

Torque M as a function of rotational speed n

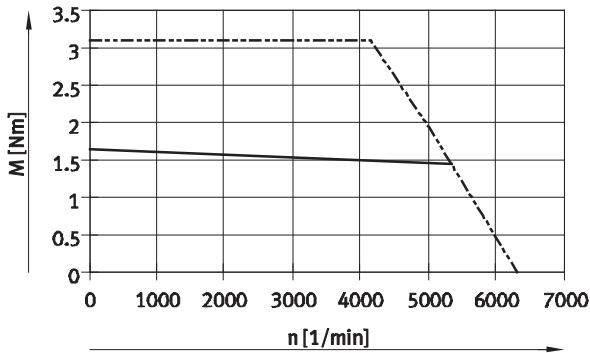
EMMS-AS-40-M (intermediate circuit voltage = 360 V)



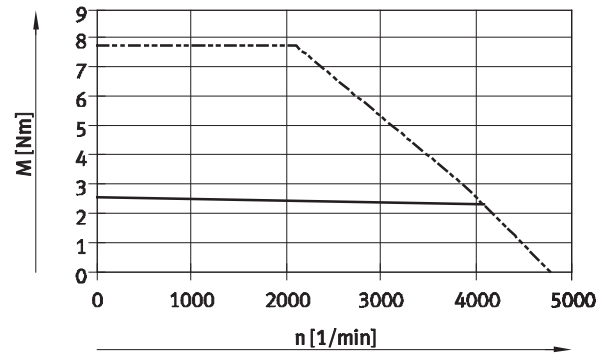
EMMS-AS-55-S (intermediate circuit voltage = 360 V)



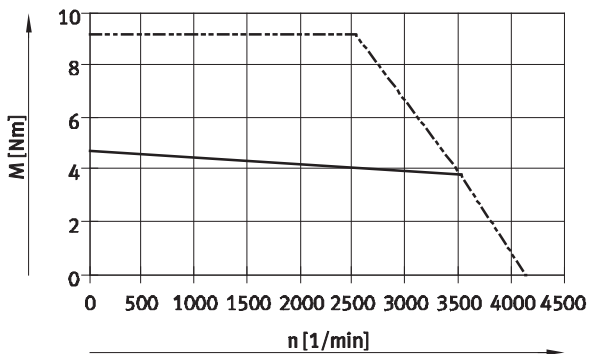
EMMS-AS-70-S (intermediate circuit voltage = 360 V)



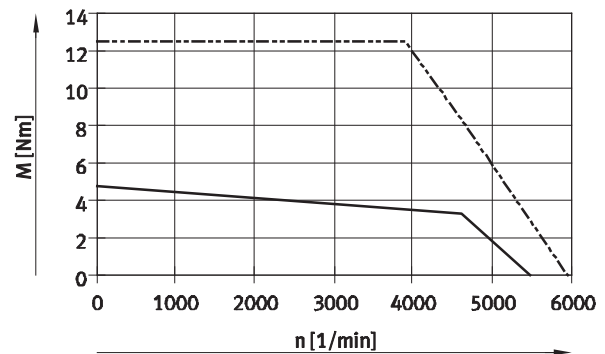
EMMS-AS-70-M (intermediate circuit voltage = 360 V)



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



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



— Rated torque
- - - Peak torque

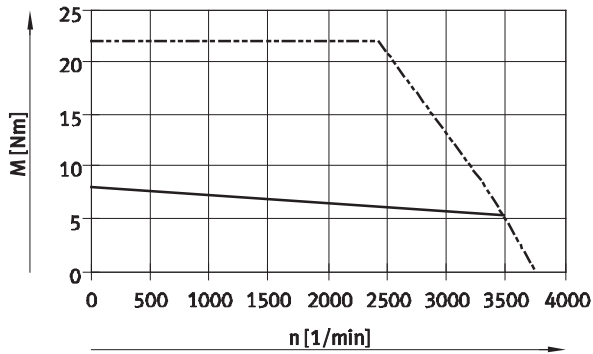
Servo motors EMMS-AS

Technical data

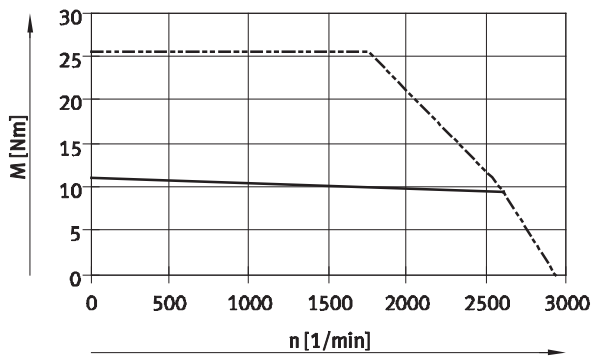
FESTO

Torque M as a function of rotational speed n

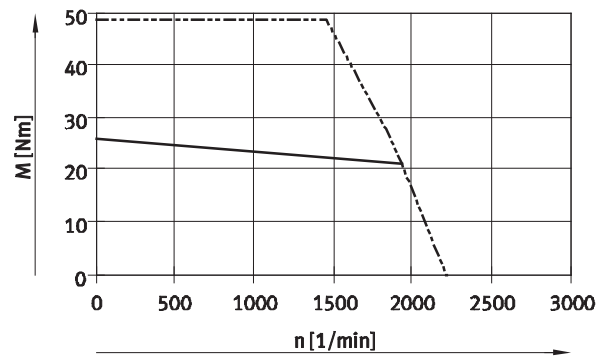
EMMS-AS-100-M (intermediate circuit voltage = 565 V)



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



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



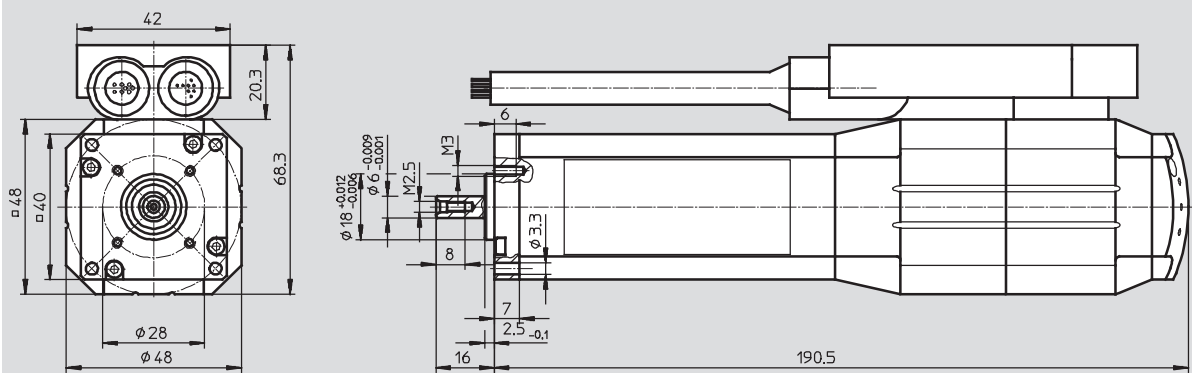
— Rated torque
- - - Peak torque

Technical data

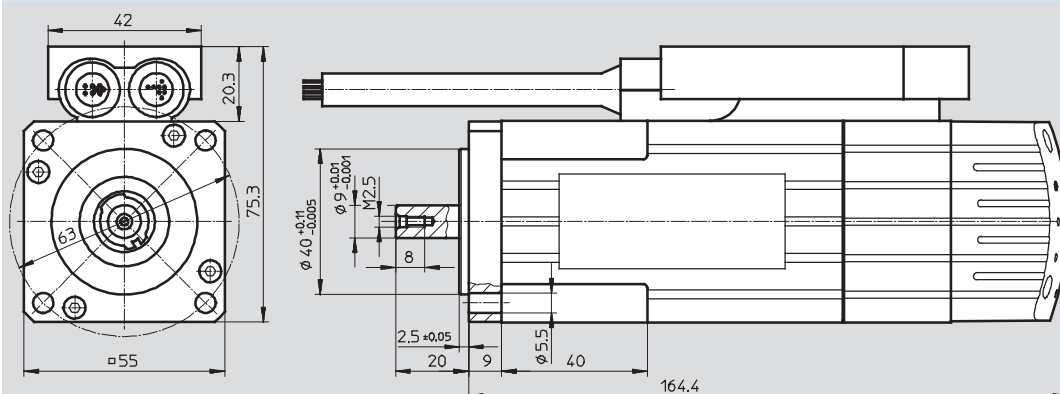
FESTO

Download CAD Data → www.festo.com/us/cad

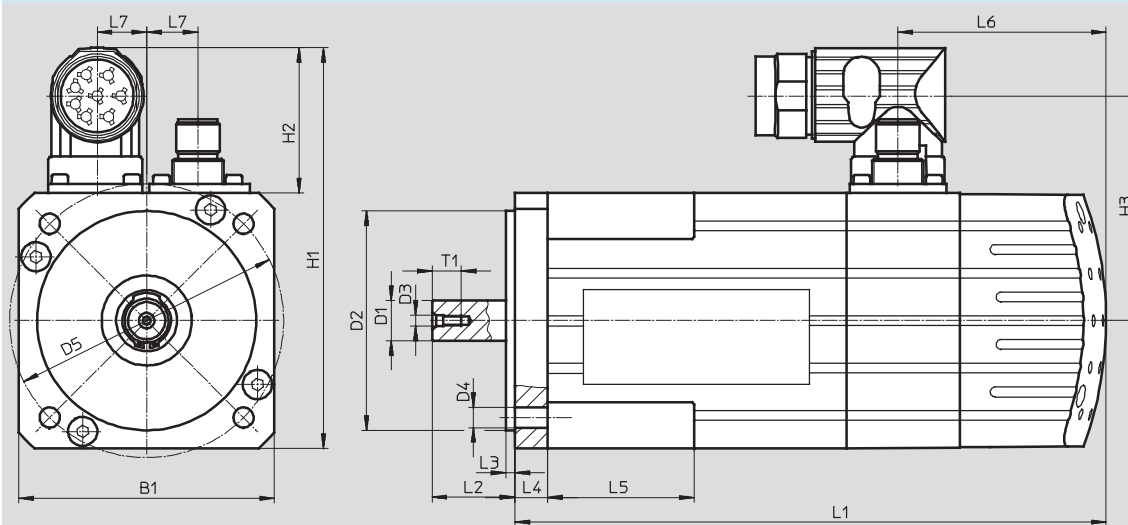
Size 40



Size 55



Sizes 70, 100, 140



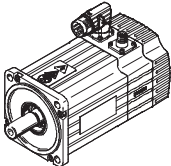
Servo motors EMMS-AS

FESTO

Technical data

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

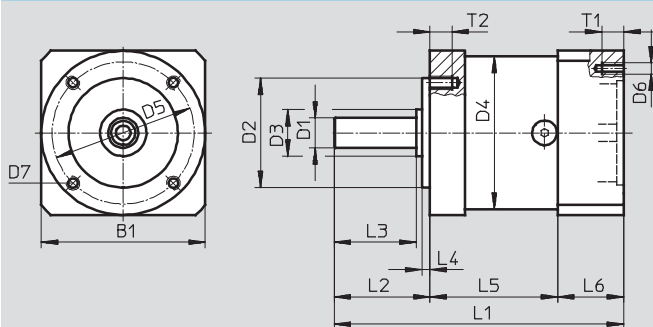
Servo motors EMMS-AS

Accessories

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Dimensions

Download CAD Data → www.festo.com/us/cad



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

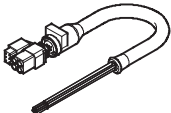
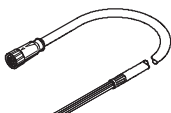
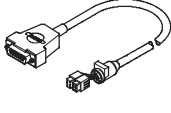
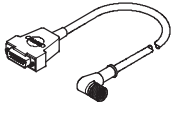
Servo motors EMMS-AS

Accessories

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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	Yellow	Red
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

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