## **Stepper motors EMMS-ST**



# **Stepper motors EMMS-ST**Key features



**→** 4

**→** 13

→ Internet: cmms-st

### **Everything from a single source**

Stepper motors EMMS-ST





- 2-phase hybrid technology
- Optionally integrated encoder for "Servo Lite operation" (closed loop)
- Sinusoidal current impressing
- Optionally with holding brake
- Protection class: IP54



### Gear unit EMGA-SST



- Planetary gear unit
- Gear ratio i = 3 and 5, available ex-stock
- Other ratios and versions on request
- Life-time lubrication

• Protection class: IP54

### Motor controller CMMS-ST



- Position controller with setpoint specifications for position, speed and torque
- "Servo Lite operation" (closed loop) with optional encoder, in other words no step losses, current following errors are corrected
- Interfaces:
  - I/O interface
  - CANopen
  - Profibus DP
  - DeviceNet

### Power supply units SVG



- Sturdy mechanical system
- Input voltage 230 V AC/ 115 V AC
- Output voltage 24, 48 V DC
- Output current 5, 10, 20 A

### Motor and encoder cables NEBM



→ Internet: svg



- Can be used in a wide temperature range
- Screened cables
- Suitable for use with energy chains
- Protection class IP65

### Axial kits EAMM

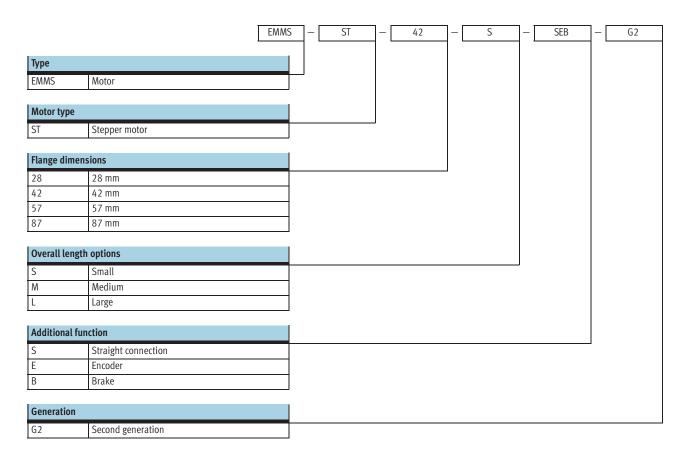


• Defined kits for all electromechanical axes from Festo

PROFIBUS®, DeviceNet®, CANopen® is a registered trademark of its respective trademark holder in certain countries.



## **Stepper motors EMMS-ST** Type codes



### -O- New Size 28

# **Stepper motors EMMS-ST** Technical data





General technical data			
Size		28	42
Motor			
Nominal voltage	[V DC]	48	48
Nominal current	[A]	1.4	1.8
Max. rotational speed <sup>1)</sup>	[rpm]	6,000	1,740
Holding torque	[Nm]	0.09	0.5
Stepper angle	[°]	1.8 ±5%	1.8 ±5%
Winding resistance	[Ω]	2.3 ±15%	1.75 ±10%
Winding inductance	[mH]	1.4	5.4
Output mass moment of inertia	[kgcm <sup>2</sup> ]	0.018/0.025 <sup>2)</sup>	0.082/0.095 <sup>2)</sup>
Radial load on shaft	[N]	20	20
Axial load on shaft	[N]	7	7
Mass moment of inertia of rotor	[kgcm <sup>2</sup> ]	0.018	0.082
Brake			
Operating voltage	[V DC]	24 ±10%	24 ±10%
Power	[W]	8	8
Holding torque	[Nm]	0.2	0.4
Mass moment of inertia	[kgcm <sup>2</sup> ]	0.007	0.013
Response delay	[ms]	2/6	2/6
Separation time	[ms]	10	10

- Theoretical max. rotational speed while idling at nominal voltage
   With brake

Size		57-S	57-M
Motor			
Nominal voltage	[V DC]	48	
Nominal current	[A]	5	
Max. rotational speed <sup>1)</sup>	[rpm]	2,720	1,940
Holding torque	[Nm]	0.8	1.4
Stepper angle	[°]	1.8 ±5%	
Winding resistance	[Ω]	0.15 ±10%	0.25 ±10%
Winding inductance	[mH]	0.5	0.95
Output mass moment of inertia	[kgcm <sup>2</sup> ]	0.29/0.30 <sup>2)</sup>	0.48/0.5 <sup>2)</sup>
Radial load on shaft	[N]	52	
Axial load on shaft	[N]	10	
Mass moment of inertia of rotor	[kgcm <sup>2</sup> ]	0.29	0.48
Brake			
Operating voltage	[V DC]	24 ±10%	
Power	[W]	8	10
Holding torque	[Nm]	0.4	1
Mass moment of inertia	[kgcm <sup>2</sup> ]	0.01	0.02
Response delay	[ms]	2/6	2/6
Separation time	[ms]	10	12

Theoretical max. rotational speed while idling at nominal voltage
 With brake



General technical data				
Size		87-S	87-M	87-L
Motor				
Nominal voltage	[V DC]	48		
Nominal current	[A]	9.5		
Max. rotational speed <sup>1)</sup>	[rpm]	2,130	550	430
Holding torque	[Nm]	2.5	5.9	9.3
Stepper angle	[°]	1.8 ±5%		
Winding resistance	[Ω]	0.1 ±10%	0.23 ±10%	0.23 ±10%
Winding inductance	[mH]	0.45	2.6	2.7
Output mass moment of inertia	[kgcm <sup>2</sup> ]	1/1.07 <sup>2)</sup>	1.9/1.97 <sup>2)</sup>	3/3.07 <sup>2)</sup>
Radial load on shaft	[N]	200		
Axial load on shaft	[N]	65		
Mass moment of inertia of rotor	[kgcm <sup>2</sup> ]	1	1.9	3
Brake				
Operating voltage	[V DC]	24 ±10%		
Power	[W]	11		
Holding torque	[Nm]	2		
Mass moment of inertia	[kgcm <sup>2</sup> ]	0.07		
Response delay	[ms]	2/6	2/6	2/6
Separation time	[ms]	25		

<sup>1)</sup> Theoretical max. rotational speed while idling at nominal voltage

<sup>2)</sup> With brake

Technical data – Encoder		
Encoder, optical		
Operating voltage	[V DC]	5
Pulses/revolution	[1/rev]	500
Zero pulse		Yes
Line driver		RS422 protocol

Weight [g]							
Size	28	42	57-S	57-M	87-S	87-M	87-L
Product weight	320	360	870	1,100	1,950	3,050	4,200
With encoder	380	450	970	1,200	2,100	3,200	4,350
With brake	320	540	1,090	1,320	2,350	3,450	4,600
With encoder and brake	380	600	1,150	1,380	2,500	3,600	5,000

Operating and environmental conditions								
Size	28	42	57-S	57-M	87-S	87-M	87-L	
Insulation protection class	В							
Heat class to EN 60034-1	В							
Rated class to EN 60034-1	S1							
Protection class: Motor shaft	IP54							
Protection class: Motor housing	IP65	IP54						
Ambient temperature [°C]	-10 +50							
Storage temperature [°C]	-20 +70							
Relative air humidity [%]	45 80							
(non-condensing)								
CE marking (see declaration of conformity)	To EU EMC Direc	tive <sup>1)</sup>						
Certification	_	– c UL us - Recognized (OL)						
	C-Tick							
Note on materials	RoHS-compliant							

<sup>1)</sup> For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com  $\Rightarrow$  Support  $\Rightarrow$  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.



### Size 28

# **Stepper motors EMMS-ST** Technical data

**FESTO** 

### Pin allocation Motor connection Size 28 Size 42, 57 Size 87 $\oplus$

1 Strin 2 Strin 3 Strin 4 Strin 5 n.c.	g A/ g B
3 Strin 4 Strin	g B
4 Strin	
	σ R/
5 n.c	5 D/
]	
6 n.c.	
7 Brak	e (24 V)
8 Brak	e (0 V)
9 –	

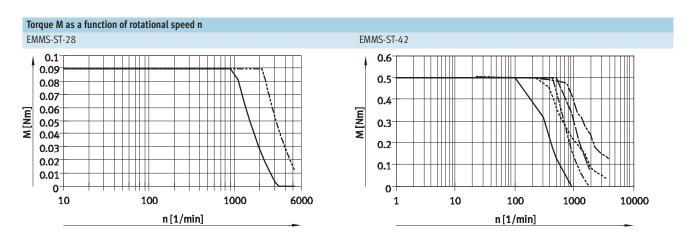
Pin	Function
1	String A
2	String A
3	String A/
4	String A/
5	String B
6	String B
7	String B/
8	String B/
9	n.c.
10	n.c.
11	Brake (24 V)
12	Brake (0 V)
13	n.c.
14	n.c.
15	n.c.

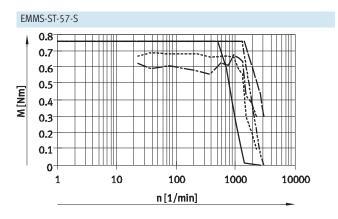
### Encoder connection

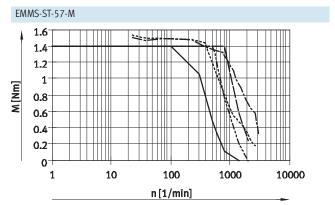


Pin	Function
1	Signal trace A
2	Signal trace A/
3	Signal trace B
4	Signal trace B/
5	0 V
6	Signal trace N
7	Signal trace N/
8	5 V

**FESTO** 







 48 V DC
 72 V DC
 24 V DC 1/4 step
 48 V DC 1/4 step

- 24 V DC

### Note

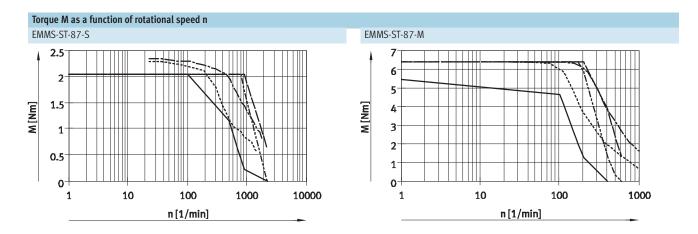
The characteristic curves apply in combination with the motor controller CMMS-ST.

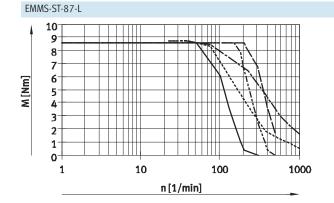
### -O- New

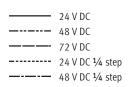
### Size 28

# **Stepper motors EMMS-ST** Technical data

**FESTO** 



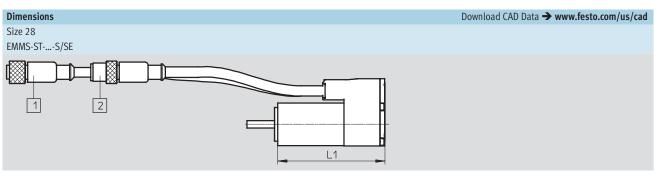


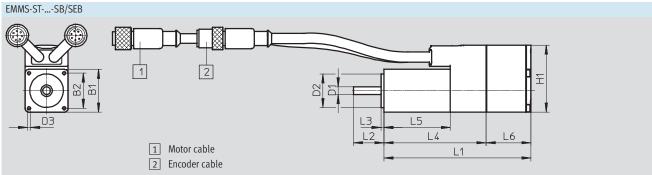


### Note

The characteristic curves apply in combination with the motor controller CMMS-ST. The size EMMS-ST-87 is operated with the motor controller CMMS-ST with max. 8A.

**FESTO** 



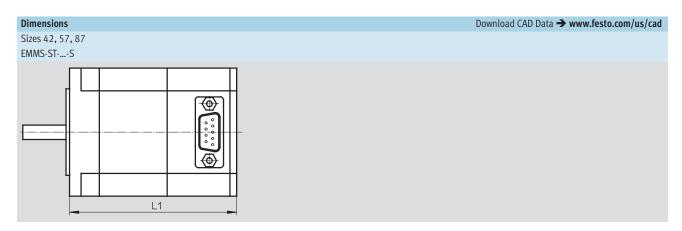


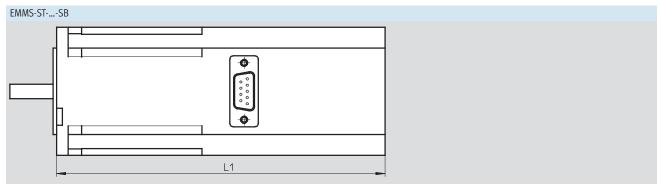
Туре	B1 ±1	B2 ±0.2	D1 ∅ -0.013	D2 ∅ −0.03	D3	H1
EMMS-ST-28-L-S EMMS-ST-28-L-SE EMMS-ST-28-L-SB EMMS-ST-28-L-SEB	28	23	5	22	M2.5x4.5	44
Туре	L1	L2 ±1	L3	L4 ±1	L5 ±1	L6 ±0.5
EMMS-ST-28-L-S EMMS-ST-28-L-SE	70±1	20	2	67	43	29

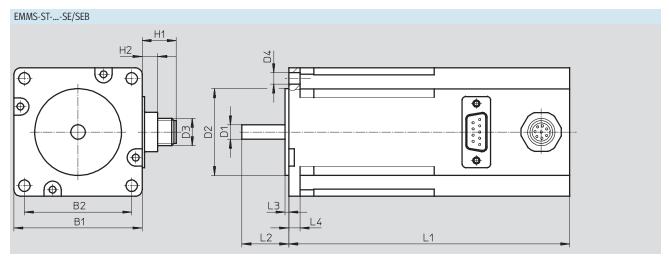
EMMS-ST-28-L-SB

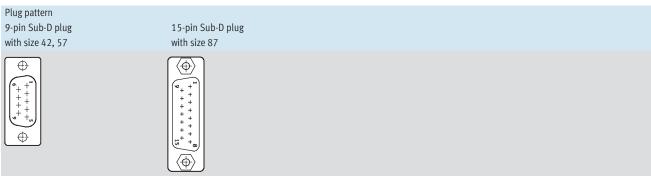
EMMS-ST-28-L-SEB

96±1.5









Туре	B1	B2	D1	D2	D3	D4
Туре	DI	D2	Ø	Ø	03	Ø
		±0.2	~	~		~
EMMS-ST-42-S-S-G2					_	
EMMS-ST-42-S-SE-G2					M12	
EMMS-ST-42-S-SB-G2	42.3	31	5-0.012	22-0.05	-	M3x4.5
EMMS-ST-42-S-SEB-G2					M12	
EMMS-ST-57-S-G2					-	
EMMS-ST-57-S-SE-G2					M12	
EMMS-ST-57-S-SB-G2					-	
EMMS-ST-57-S-SEB-G2					M12	
EMMS-ST-57-M-S-G2	56.4	47.14	6.35-0.013	38.1±0.025	- M12	5
EMMS-ST-57-M-SE-G2					M12	
EMMS-ST-57-M-SB-G2					-	
EMMS-ST-57-M-SEB-G2					M12	
EMMS-ST-87-S-G2					-	
EMMS-ST-87-S-SE-G2					M12	
EMMS-ST-87-S-SB-G2					-	
EMMS-ST-87-S-SEB-G2					M12	
EMMS-ST-87-M-S-G2					- M12	
EMMS-ST-87-M-SE-G2					M12	
EMMS-ST-87-M-SB-G2	85.85	69.5	11-0.013	73-0.046	-	6.6
EMMS-ST-87-M-SEB-G2					M12	
EMMS-ST-87-L-S-G2					- W12	
EMMS-ST-87-L-SE-G2					M12	
EMMS-ST-87-L-SB-G2					- W12	
EMMS-ST-87-L-SEB-G2					M12	
LIVING STOT L SED G2					IVIIZ	
Type	H1	H2	L1	L2	L3	L4
Туре	H1	H2	L1	L2	L3	L4
Туре	H1	H2	L1	L2	L3	L4
	H1 -	H2		L2	L3	L4
EMMS-ST-42-S-S-G2	-	H2	66±1	L2		L4
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2		H2	66±1 94±1.2	L2 24±1	L3 2	L4 -
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2	- 13 -	H2	66±1 94±1.2 114±1.3			L4 -
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-42-S-SEB-G2	- 13	H2	66±1 94±1.2 114±1.3 127±1.3			L4 -
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-42-S-SEB-G2 EMMS-ST-57-S-S-G2	- 13 - 13	H2	66±1 94±1.2 114±1.3 127±1.3 73.5±0.8			L4 -
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-42-S-SEB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-S-G2	- 13 - 13 - 13	H2	66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1			L4 -
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-42-S-SEB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SE-G2	- 13 - 13 - 13 -	H2	66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1	24±1	2	-
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SB-G2 EMMS-ST-57-S-SB-G2	- 13 - 13 - 13 - 13	H2	66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1			L4 - 5
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SB-G2 EMMS-ST-57-S-SB-G2 EMMS-ST-57-S-SB-G2 EMMS-ST-57-S-SEB-G2	- 13 - 13 - 13 - 13 -	H2	66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8	24±1	2	-
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SB-G2 EMMS-ST-57-S-SB-G2 EMMS-ST-57-S-SEB-G2 EMMS-ST-57-M-S-G2 EMMS-ST-57-M-S-G2	- 13 - 13 - 13 - 13 - 13	H2	66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1	24±1	2	-
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-42-S-SEB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2	- 13 - 13 - 13 - 13 - 13 -		66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1 145±1.1	24±1	2	-
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SB-G2 EMMS-ST-57-M-S-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SB-G2 EMMS-ST-57-M-SB-G2	- 13 - 13 - 13 - 13 - 13 - 13	H2	66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1 145±1.1 159.5±1.1	24±1	2	-
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-M-S-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SB-G2 EMMS-ST-57-M-SB-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2	- 13 - 13 - 13 - 13 - 13 - 13 -		66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1 145±1.1 159.5±1.1 82.6±1	24±1	2	-
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-S-G2 EMMS-ST-87-S-S-G2	- 13 - 13 - 13 - 13 - 13 - 13 - 13		66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1 145±1.1 159.5±1.1 82.6±1 112.6±1.3	24±1	2	-
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-42-S-SEB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SB-G2 EMMS-ST-57-S-SEB-G2 EMMS-ST-57-M-S-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SEB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-S-G2 EMMS-ST-87-S-S-G2	- 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13		66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1 145±1.1 159.5±1.1 82.6±1 112.6±1.3 132.6±1.3	24±1	2	-
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-42-S-SEB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SB-G2 EMMS-ST-57-S-SEB-G2 EMMS-ST-57-M-S-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SEB-G2 EMMS-ST-57-M-SEB-G2 EMMS-ST-57-M-SEB-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SE-G2	- 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13		66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1 145±1.1 159.5±1.1 82.6±1 112.6±1.3 132.6±1.3	24±1	2	-
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SEB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SEB-G2 EMMS-ST-57-M-S-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SEB-G2 EMMS-ST-87-S-SEB-G2 EMMS-ST-87-S-SEB-G2 EMMS-ST-87-S-SEB-G2	- 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13		66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1 145±1.1 159.5±1.1 82.6±1 112.6±1.3 132.6±1.3 114.9±1	24±1	2	-
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SEB-G2 EMMS-ST-57-M-S-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-SEB-G2 EMMS-ST-87-S-SEB-G2 EMMS-ST-87-M-SE-G2 EMMS-ST-87-M-SE-G2 EMMS-ST-87-M-SE-G2	- 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13		66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1 145±1.1 159.5±1.1 82.6±1 112.6±1.3 132.6±1.3 114.9±1 144.9±1.3	24±1	2	-
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SEB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SEB-G2 EMMS-ST-57-M-S-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-SEB-G2 EMMS-ST-87-S-SEB-G2 EMMS-ST-87-M-SE-G2 EMMS-ST-87-M-SE-G2 EMMS-ST-87-M-SE-G2 EMMS-ST-87-M-SE-G2 EMMS-ST-87-M-SE-G2 EMMS-ST-87-M-SE-G2 EMMS-ST-87-M-SE-G2 EMMS-ST-87-M-SE-G2	- 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13		66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1 145±1.1 159.5±1.1 82.6±1 112.6±1.3 132.6±1.3 114.9±1 144.9±1.3 164.9±1.3	24±1 20.6±0.5	1.6	5
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SB-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SB-G2 EMMS-ST-57-M-SB-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-SB-G2 EMMS-ST-87-S-SB-G2 EMMS-ST-87-S-SB-G2 EMMS-ST-87-S-SB-G2 EMMS-ST-87-M-SB-G2 EMMS-ST-87-M-SB-G2 EMMS-ST-87-M-SB-G2 EMMS-ST-87-M-SB-G2 EMMS-ST-87-M-SB-G2 EMMS-ST-87-M-SB-G2 EMMS-ST-87-M-SB-G2 EMMS-ST-87-M-SB-G2	- 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13		66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1 145±1.1 159.5±1.1 82.6±1 112.6±1.3 132.6±1.3 114.9±1 144.9±1.3 164.9±1.3 184.9±3≥3	24±1 20.6±0.5	1.6	5
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-M-S-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-S-SE-G2 EMMS-ST-87-M-SE-G2	- 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13		66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1 145±1.1 159.5±1.1 82.6±1 112.6±1.3 132.6±1.3 114.9±1 144.9±1.3 164.9±1.3 184.9±3≈3 144.9±1	24±1 20.6±0.5	1.6	5
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SEB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-SEB-G2 EMMS-ST-87-S-SEB-G2 EMMS-ST-87-S-SEB-G2 EMMS-ST-87-M-SE-G2 EMMS-ST-87-L-S-G2 EMMS-ST-87-L-S-G2	- 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13		$\begin{array}{c} 66 \pm 1 \\ 94 \pm 1.2 \\ 114 \pm 1.3 \\ 127 \pm 1.3 \\ 73.5 \pm 0.8 \\ 102.5 \pm 1.1 \\ 123.5 \pm 1.1 \\ 138 \pm 1.1 \\ 95 \pm 0.8 \\ 124 \pm 1.1 \\ 145 \pm 1.1 \\ 159.5 \pm 1.1 \\ 82.6 \pm 1 \\ 112.6 \pm 1.3 \\ 132.6 \pm 1.3 \\ 152.6 \pm 1.3 \\ 114.9 \pm 1 \\ 144.9 \pm 1.3 \\ 164.9 \pm 1.3 \\ 184.9 \pm 3 \pm 3 \\ 144.9 \pm 1 \\ 174.9 \pm 1.3 \\ \end{array}$	24±1 20.6±0.5	1.6	5
EMMS-ST-42-S-S-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SE-G2 EMMS-ST-42-S-SB-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-S-G2 EMMS-ST-57-S-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-57-M-SE-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-S-S-G2 EMMS-ST-87-M-S-G2	- 13 - 13 - 13 - 13 - 13 - 13 - 13 - 13		66±1 94±1.2 114±1.3 127±1.3 73.5±0.8 102.5±1.1 123.5±1.1 138±1.1 95±0.8 124±1.1 145±1.1 159.5±1.1 82.6±1 112.6±1.3 132.6±1.3 114.9±1 144.9±1.3 164.9±1.3 184.9±3≈3 144.9±1	24±1 20.6±0.5	1.6	5

### -O- New Size 28

# Stepper motors EMMS-ST Technical data

Ordering data							
	Size	Variant			Part No.	Туре	
		Basic design With encoder With brake					
	28	-			1451384	EMMS-ST-28-L-S	
			•		1430663	EMMS-ST-28-L-SE	
				•	1451383	EMMS-ST-28-L-SB	
			•		1451382	EMMS-ST-28-L-SEB	
	42	•			1370470	EMMS-ST-42-S-S-G2	
			•		1370471	EMMS-ST-42-S-SE-G2	
				-	1370472	EMMS-ST-42-S-SB-G2	
					1370473	EMMS-ST-42-S-SEB-G2	
	57				1370474	EMMS-ST-57-S-S-G2	
					1370475	EMMS-ST-57-S-SE-G2	
				•	1370476	EMMS-ST-57-S-SB-G2	
					1370477	EMMS-ST-57-S-SEB-G2	
					1370478	EMMS-ST-57-M-S-G2	
					1370479	EMMS-ST-57-M-SE-G2	
				•	1370480	EMMS-ST-57-M-SB-G2	
					1370481	EMMS-ST-57-M-SEB-G2	
	87				1370482	EMMS-ST-87-S-S-G2	
					1370483	EMMS-ST-87-S-SE-G2	
				-	1370484	EMMS-ST-87-S-SB-G2	
				•	1370485	EMMS-ST-87-S-SEB-G2	
					1370486	EMMS-ST-87-M-S-G2	
			•		1370487	EMMS-ST-87-M-SE-G2	
				-	1370488	EMMS-ST-87-M-SB-G2	
			•	•	1370489	EMMS-ST-87-M-SEB-G2	
					1370490	EMMS-ST-87-L-S-G2	
			•		1370491	EMMS-ST-87-L-SE-G2	
				•	1370493	EMMS-ST-87-L-SB-G2	
			•	•	1370494	EMMS-ST-87-L-SEB-G2	

## **Stepper motors EMMS-ST** Accessories

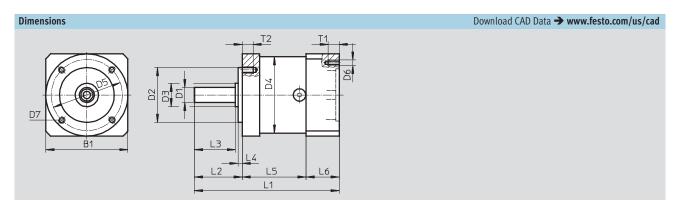
Gear unit EMGA





General technical data									
For motor size		42		57		87			
Gear unit type		EMGA-40-P	EMGA-40-P-G		-G	EMGA-80-F	EMGA-80-P-G		
Gear ratio	[i]	3	5	3	5	3	5		
Continuous output torque <sup>1)</sup>	[Nm]	11	14	22	22	85	110		
Max. output torque	[Nm]	17.6	22	22	22	136	176		
Torsional rigidity	[Nm/arcmin]	1		2.3		6			
Torsional backlash	[deg]	0.4		0.27		0.15			
Moment of inertia <sup>2)</sup>	[kgcm <sup>2</sup> ]	0.031	0.019	0.135	0.078	0.77	0.45		
Efficiency	[%]	96				•			
Operating temperature <sup>3)</sup>	[°C]	-25 +90							
Protection class		IP54							

- At the output shaft
   In relation to the drive shaft
   Note the temperature range of the motor



For size	B1	D1	D2	D3	D4	D5	D6	D7	L1	L2	L3	L4	L5	L6	T1	T2
		Ø	Ø	Ø	Ø	Ø										
		h7	h7						±1.5		±0.2	±0.2				
42	40	10	26	12	40	34	Ø3.4	M4	92.5	26±0.6	23	2	39	27.5	5	6
57	60	11	40	17	60	52	M4	M5	106	35±0.8	30	3	47	24	8	8
87	90	20	60	25	80	70	M5	M6	135.5	40±0.8	36	3	60	35.5	12	10

Ordering data			
For size	Gear ratio	Part No.	Туре
42	3	549428	EMGA-40-P-G3-SST-42
	5	549429	EMGA-40-P-G5-SST-42
57	3	549430	EMGA-60-P-G3-SST-57
	5	549431	EMGA-60-P-G5-SST-57
87	3	549432	EMGA-80-P-G3-SST-87
	5	549433	EMGA-80-P-G5-SST-87

Ordering data				
	Description	Cable length [m]	Part No.	Туре
Motor cable				
For EMMS-ST-28				
and motor controller CMMO-ST				
	Straight plug			
32)	- Min. bending radius: 62 mm	1.5	1449600	NEBM-M12G8-E-1.5-Q5-LE6
	- Suitable for use with energy	2.5	1449601	NEBM-M12G8-E-2.5-Q5-LE6
	chains  - Ambient temperature:	5	1449602	NEBM-M12G8-E-5-Q5-LE6
· ·	-40 +80 °C	7	1449603 1449604	NEBM-M12G8-E-7-Q5-LE6 NEBM-M12G8-E-10-Q5-LE6
	-40 +80 C	X length 1)	1449604	NEBM-M12G8-EQ5-LE6
		A teligili -	1449003	NEDWI-W12GO-EQ3-LEG
For EMMS-ST-42/57				
and motor controller CMMS-ST				
	Straight plug			
	<ul><li>Min. bending radius: 58 mm</li></ul>	5	550740	NEBM-S1G9-E-5-LE6
	<ul> <li>Suitable for use with energy</li> </ul>	10	550741	NEBM-S1G9-E-10-LE6
	chains	15	550742	NEBM-S1G9-E-15-LE6
	<ul> <li>Ambient temperature:</li> </ul>			
	−40 +70 °C	X length <sup>1)</sup>	550743	NEBM-S1G9-ELE6
and motor controller CMMO-ST				
	Angled plug			
	- Min. bending radius: 62 mm	1.5	1450736	NEBM-S1W9-E-1.5-Q5-LE6
	- Suitable for use with energy	2.5	1450737	NEBM-S1W9-E-2.5-Q5-LE6
<b>PA</b>	chains	5	1450738	NEBM-S1W9-E-5-Q5-LE6
	- Ambient temperature: -40 +80 °C	7	1450739	NEBM-S1W9-E-7-Q5-LE6
	-40 +80 C	X length 1)	1450740	NEBM-S1W9-E-10-Q5-LE6
		A tength -	1450741	NEBM-S1W9-EQ5-LE6
For EMMS-ST-87				
and motor controller CMMS-ST				
and motor controller emino 51	Straight plug			
	- Min. bending radius: 70 mm	5	550744	NEBM-S1G15-E-5-LE6
	<ul> <li>Suitable for use with energy</li> </ul>	10	550745	NEBM-S1G15-E-10-LE6
	chains	-		
	- Ambient temperature:	15	550746	NEBM-S1G15-E-15-LE6
	−30 +70 °C	X length 1)	550747	NEBM-S1G15-ELE6
and motor controller CMMO-ST	·			
	Angled plug			
	- Min. bending radius: 80 mm	1.5	1450943	NEBM-S1W15-E-1.5-Q7-LE6
	- Suitable for use with energy	2.5	1450944	NEBM-S1W15-E-2.5-Q7-LE6
CHA	chains	5	1450945	NEBM-S1W15-E-5-Q7-LE6
	- Ambient temperature:	7	1450946	NEBM-S1W15-E-7-Q7-LE6
	−40 +80 °C	10	1450947	NEBM-S1W15-E-10-Q7-LE6
		X length 1)	1450948	NEBM-S1W15-EQ7-LE6

<sup>1)</sup> Max. 25 m

# Stepper motors EMMS-ST Accessories

Ordering data												
	Description	Cable length [m]	Part No.	Туре								
Encoder cable												
For motor controller CMMS-ST												
	Straight plug	Straight plug										
	- Min. bending radius: 51 mm	5	550748	NEBM-M12G8-E-5-S1G9								
	<ul> <li>Suitable for use with energy chains</li> </ul>	10	550749	NEBM-M12G8-E-10-S1G9								
	- Ambient temperature:	15	550750	NEBM-M12G8-E-15-S1G9								
	−40 +70 °C	X length <sup>1)</sup>	550751	NEBM-M12G8-ES1G9								
	<u>'</u>		1									
For motor controller CMMO-ST												
	Straight plug	Straight plug										
	- Min. bending radius: 68 mm	1.5	1451586	NEBM-M12G8-E-1.5-LE8								
	<ul> <li>Suitable for use with energy</li> </ul>	2.5	1451587	NEBM-M12G8-E-2.5-LE8								
	chains	5	1451588	NEBM-M12G8-E-5-LE8								
	<ul> <li>Ambient temperature:</li> </ul>	7	1451589	NEBM-M12G8-E-7-LE8								
	−40 +80 °C	10	1451590	NEBM-M12G8-E-10-LE8								
		X length 1)	1451591	NEBM-M12G8-ELE8								
	Angled plug	Angled plug										
	- Min. bending radius: 68 mm	1.5	1451674	NEBM-M12W8-E-1.5-LE8								
	- Suitable for use with energy	2.5	1451675	NEBM-M12W8-E-2.5-LE8								
	chains	5	1451676	NEBM-M12W8-E-5-LE8								
CHAIR .	<ul> <li>Ambient temperature:</li> </ul>	7	1451677	NEBM-M12W8-E-7-LE8								
	−40 +80 °C	10	1451678	NEBM-M12W8-E-10-LE8								
		X length 1)	1451679	NEBM-M12W8-ELE8								

<sup>1)</sup> Max. 25 m

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