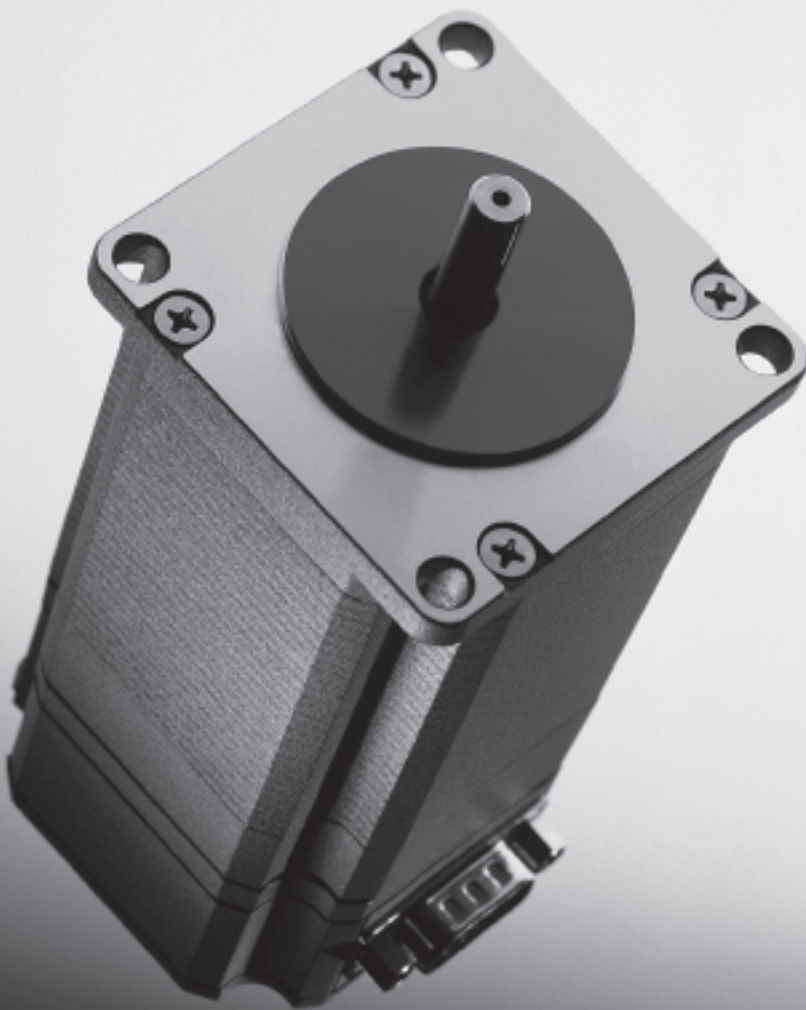


- 1 - Type discontinued
Available up until 2008

Stepper motors MTR-ST

FESTO



- Low-cost drive solutions
- Simple commissioning
- Co-ordinated motor controller combinations

- I - Type discontinued
Available up until 2008

FESTO

Stepper motors MTR-ST

Key features

At a glance

Motor MTR-ST

→ 6

- System product for positioning applications
- Without/with brake
- Without/with gear unit
- Controlled operation
- High torque at low angle velocity or during single steps
- Step-accurate positioning through specified number of control pulses
- High holding torque and resolution



Motor flange MTR-FL

→ 10

- The right motor flange for every motor axis combination



Motor cable KMTR-ST

→ 11

- Screened cable
- Can be used at -40 ... +125 °C
- Suitable for chain link trunking
- Protection class IP67



Motor controller SEC-ST

→ 12

- System product for positioning applications
- Compact unit, ready for installation
- Adjustable power range for all motors
- Full, half, quarter, fifth, eighth, tenth, thirty-second step mode
- Selectable current reduction
- Pre-assembled electrical connection accessories



Power supply unit SVG

→ 13

- Robust hardware
- Input voltage 230 V AC/115 V AC
- Output voltage 48 V DC
- Nominal output current 5/10/20 A

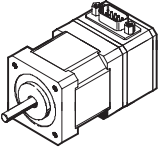


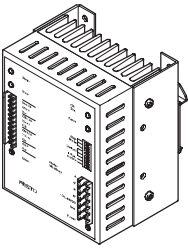
- 1 - Type discontinued
Available up until 2008

FESTO

Stepper motors MTR-ST

Selection aid

| | Motor version | Holding torque M_H in Nm | With integrated controller | With gear unit, unit ratio 4:1 | With brake | → Page/Internet |
|---|------------------|-------------------------------|-------------------------------|-----------------------------------|------------|-----------------|
|  | MTR-ST-42-48S-AA | 0.34 | - | - | - | 6 |
| | MTR-ST-42-48S-AB | 0.34 | - | - | ■ | |
| | MTR-ST-57-48S-AA | 1.27 | - | - | - | |
| | MTR-ST-57-48S-AB | 1.27 | - | - | ■ | |
| | MTR-ST-87-48S-AA | 6.47 | - | - | - | |
| | MTR-ST-87-48S-AB | 6.47 | - | - | ■ | |
| | MTR-ST-87-48S-GA | 23.29 | - | ■ | - | |
| | MTR-ST-87-48S-GB | 23.29 | - | ■ | ■ | |

| | Motor controller version | Supply voltage | Nominal current | Operating mode | Interface | → Page/Internet |
|---|--------------------------|----------------|-----------------|--|-----------------|-----------------|
|  | SEC-ST-48-6-P01 | 24 ... 48 V DC | 1.25 ... 6 A | 1/1; 1/2; 1/4; 1/5; 1/8, 1/10; 1/32 | Pulse/direction | 12 |

- I - Type discontinued
Available up until 2008

Stepper motors MTR-ST

Selection aid

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| Permissible combinations | | | |
|---------------------------------|--|--------------------------------------|-----------------|
| Motor | MTR-ST-42-48S-AA ¹⁾ MTR-ST-42-48S-AB ¹⁾ | MTR-ST-57-48S-AA MTR-ST-57-48S-AB | → Page/Internet |
| Motor controller | | | |
| SEC-ST-48-6-P01 | ■ | ■ | 12 |
| Cable | | | |
| KMTR-ST-... | ■ | ■ | 11 |
| KMTRE-ST-... | - | - | |
| Motor flange | | | |
| MTR-FL28-ST42 | ■ | - | 10 |
| MTR-FL30-ST42 | ■ | - | |
| MTR-FL44-ST57 | - | ■ | |
| Electro-mechanical drive | | | |
| DGE-8-...-ZR | ■ | - | dge-zr |
| DGE-12-...-ZR | ■ | - | |
| DGE-18-...-ZR | - | ■ | |
| DGE-25-...-ZR | - | ■ | |
| DGE-18-...-SP | ■ | - | dge-sp |
| DGE-25-...-SP | - | ■ | |

- 1) The flange MTR-FL30-ST42 must be used in combination with the axis DGE-12-...-ZR
The flange MTR-FL28-ST42 must be used in combination with the axis DGE-8-...-ZR or DGE-18-...-SP

| Permissible combinations | | | |
|---------------------------------|--|--------------------------------------|-----------------|
| Motor | MTR-ST-87-48S-AA ¹⁾ MTR-ST-87-48S-AB ¹⁾ | MTR-ST-87-48S-GA MTR-ST-87-48S-GB | → Page/Internet |
| Motor controller | | | |
| SEC-ST-48-6-P01 | ■ | ■ | 12 |
| Cable | | | |
| KMTR-ST-... | ■ | ■ | 11 |
| KMTRE-ST-... | - | - | |
| Motor flange | | | |
| MTR-FL44-ST87 | ■ | - | 10 |
| MTR-FL64-ST87 | ■ | - | |
| MTR-FL64-PL80 | - | ■ | |
| Electro-mechanical drive | | | |
| DGE-25-...-ZR | ■ | - | dge-zr |
| DGE-40-...-ZR | - | ■ | |
| DGE-40-...-SP | ■ | - | dge-sp |
| DGE-63-...-SP | - | ■ | |
| DGEA-18-...-ZR | ■ | - | dgea |
| DGEA-25-...-ZR | ■ | - | |
| DGEA-40-...-ZR | - | ■ | |

- 1) The flange MTR-FL44-ST87 must be used in combination with the axis DGE-25-...-ZR or DGEA-18-...-ZR
The flange MTR-FL64-ST87 must be used in combination with the axis DGE-40-...-SP or DGEA-25-...-ZR

Stepper motors MTR-ST

Type code

| | | | | | | | | | | |
|--|------------------------|-----|---|----|---|----|---|-----|---|----|
| | | MTR | - | ST | - | 42 | - | 48S | - | AB |
| Type | | | | | | | | | | |
| MTR | Motor | | | | | | | | | |
| Motor type | | | | | | | | | | |
| ST | Stepper motor | | | | | | | | | |
| Flange dimensions | | | | | | | | | | |
| 42 | 42 mm | | | | | | | | | |
| 57 | 57 mm | | | | | | | | | |
| 87 | 87 mm | | | | | | | | | |
| Nominal voltage/connection type | | | | | | | | | | |
| 48 | 24 ... 48 V DC | | | | | | | | | |
| S | Plug connection | | | | | | | | | |
| Additional function | | | | | | | | | | |
| A | No additional function | | | | | | | | | |
| G | Gear unit | | | | | | | | | |
| B | Brake | | | | | | | | | |

- I - Type discontinued
Available up until 2008

Stepper motors MTR-ST

Technical data

FESTO



| Electrical and mechanical data for MTR-ST-42-48S-... | | |
|--|------------------|------------------|
| | MTR-ST-42-48S-AA | MTR-ST-42-48S-AB |
| Nominal voltage [V] | 48 | |
| Nominal current, motor [A] | 1.8 | |
| Holding torque, motor [Nm] | 0.34 | |
| Stepper angle (full step) [°] | 1.8 ±5% | |
| Winding resistance [Ω] | 1.75 ±10% | |
| Winding inductance [mH] | 3.0 | |
| Drive mass moment of inertia [kg cm ²] | 0.068 | 0.07 |
| Voltage, brake [V] | – | 24 |
| Power, brake [W] | – | 6 |
| Holding torque, brake [Nm] | – | 0.4 |
| Radial shaft load [N] | 18 | 18 |
| Axial shaft load [N] | 7 | 7 |
| Product weight [kg] | 0.39 | 0.49 |


| Electrical and mechanical data for MTR-ST-57-48S-... | | |
|--|------------------|------------------|
| | MTR-ST-57-48S-AA | MTR-ST-57-48S-AB |
| Nominal voltage [V] | 48 | |
| Nominal current, motor [A] | 3.1 | |
| Holding torque, motor [Nm] | 1.27 | |
| Stepper angle (full step) [°] | 1.8 ±5% | |
| Winding resistance [Ω] | 1 ±10% | |
| Winding inductance [mH] | 3.8 ±20% | |
| Drive mass moment of inertia [kg cm ²] | 0.48 | 0.5 |
| Voltage, brake [V] | – | 24 |
| Power, brake [W] | – | 6 |
| Holding torque, brake [Nm] | – | 0.4 |
| Radial shaft load [N] | 71 | 71 |
| Axial shaft load [N] | 10 | 10 |
| Product weight [kg] | 1.2 | 1.4 |

Stepper motors MTR-ST

Technical data


| Electrical and mechanical data for MTR-ST-87-48S-... | | | | |
|--|------------------|------------------|------------------|------------------|
| | MTR-ST-87-48S-AA | MTR-ST-87-48S-AB | MTR-ST-87-48S-GA | MTR-ST-87-48S-GB |
| Nominal voltage [V] | 48 | | | |
| Nominal current, motor [A] | 4.7 | | | |
| Holding torque, motor [Nm] | 6.47 | | 23.29 | |
| Stepper angle (full step) [°] | 1.8 ±5% | | | |
| Winding resistance [Ω] | 0.9 ±10% | | | |
| Winding inductance [mH] | 10.8 ±20% | | | |
| Gear unit ratio | – | | 4:1 | 4:1 |
| Gear unit efficiency | – | | 0.9 | 0.9 |
| Torsional backlash [arcmin] | – | | 15 | 15 |
| Torsional resistance [Nm/arcmin] | – | | 5.2 | 5.2 |
| Drive mass moment of inertia [kg cm ²] | 4 | 4.05 | 4.52 | 4.6 |
| Voltage, brake [V] | – | 24 | – | 24 |
| Power, brake [W] | – | 9 | – | 9 |
| Holding torque, brake [Nm] | – | 1.4 | – | 1.4 |
| Radial shaft load [N] | 130 | 130 | 950 | 950 |
| Axial shaft load [N] | 50 | 50 | 1 200 | 1 200 |
| Product weight [kg] | 4.2 | 5.0 | 6.4 | 7.2 |

| Operating and environmental conditions | | | | |
|--|-------------------------|---------------|--------------------|--------------------|
| | MTR-ST-42-... | MTR-ST-57-... | MTR-ST-87-...-A... | MTR-ST-87-...-G... |
| Insulation protection class to VDE 60034 | B | | | |
| Protection class without/with gear unit | IP54 | | IP54 | IP43 |
| Ambient temperature [°C] | 0 ... +50 | | | |
| CE marking symbol (see conformity declaration) | As per EU EMC directive | | | |
| Storage temperature [°C] | –25 ... +60 | | | |
| Relative air humidity (non-condensing) [%] | 45 ... 80 | | | |

 Note

Specifications are valid for full step operation, 48 V and maximum continuous output.

| Technical data for cables | | | | |
|---------------------------|-------------------------------------|---------------------|----------------------------------|------------------------------|
| | Cable composition | Ambient temperature | Suitable for chain link trunking | Protection class, motor plug |
| KMTR-ST-... | 7 x 0.34 mm ² , screened | –40 ... +125 °C | ■ | IP67 |

-  - Type discontinued
Available up until 2008

Stepper motors MTR-ST

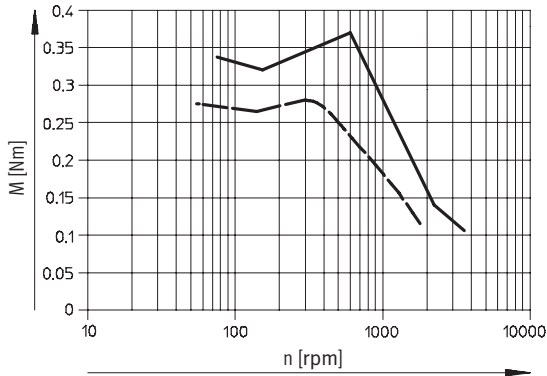
Technical data

FESTO

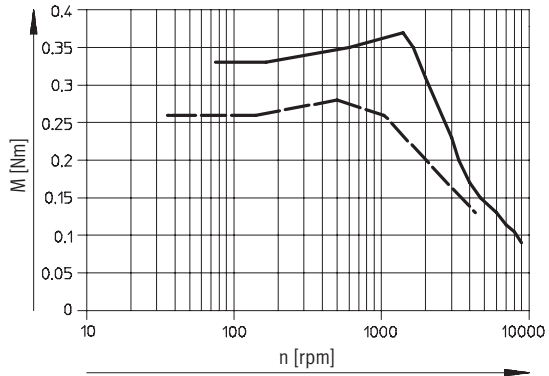
Torque M as a function of n (r.p.m.)

at nominal voltage 24 V

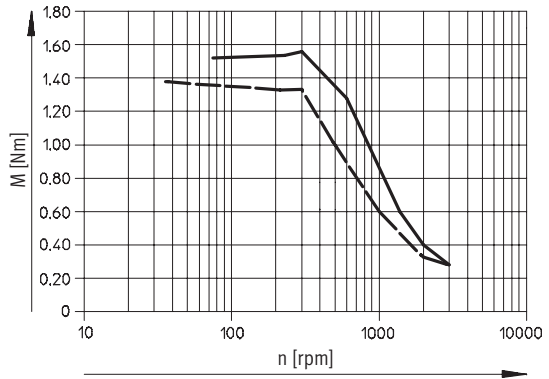
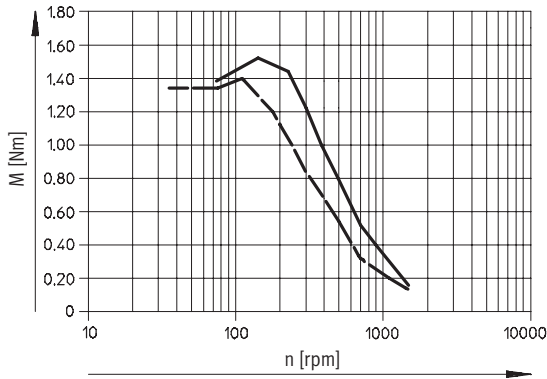
MTR-ST-42-48S...



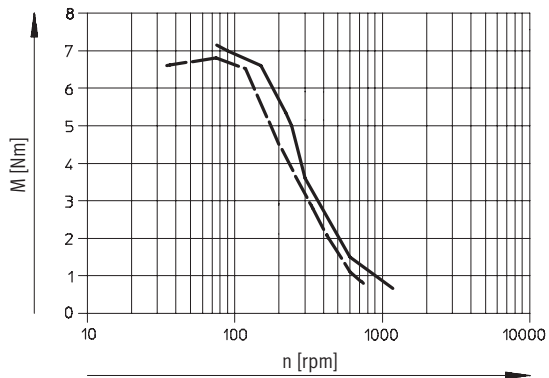
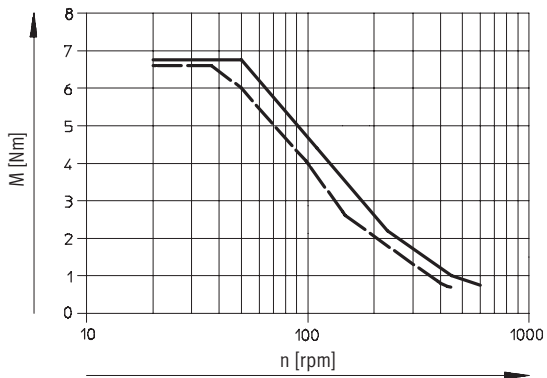
at nominal voltage 48 V




MTR-ST-57-48S...



MTR-ST-87-48S...



— Full step
- - - Half step

-  - Note

Characteristic curves apply to motors without gear unit.
The gear unit data must be taken into consideration for motors with gear unit.

Example:
Holding torque for motor MTR-ST-87-48S...

without gear unit:
Holding torque = 6.47 Nm
(see characteristic curve)

with gear unit:
Gear unit ratio = 4:1
Gear unit efficiency = 0.9
Holding torque =
 $6.47 \text{ Nm} \times 4 \times 0.9 = 23.29 \text{ Nm}$

Stepper motors MTR-ST

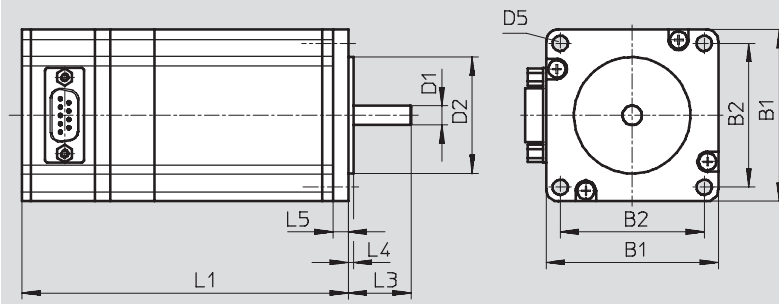
Technical data

Dimensions

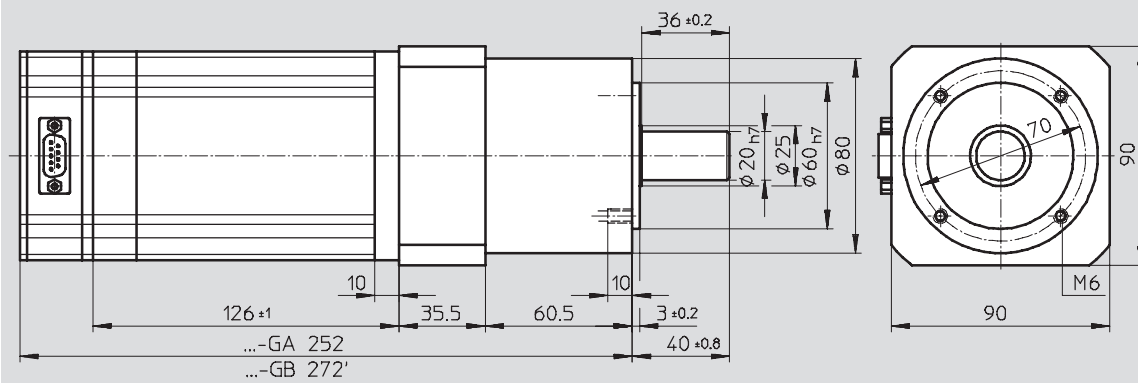
Download CAD data → www.festo.com

Motor


MTR-ST-...-A... (without gear unit)



MTR-ST-87-48S-G... (with gear unit)



| Type | B1 | B2 | D1 ∅ | D2 ∅ | D5 | L1 | L3 | L4 | L5 |
|------------------|------|-------|---------|---------|-------|-----|------|-----|----|
| MTR-ST-42-48S-AA | 42 | 31 | 5 | 22 | M3 | 73 | 24 | 2 | - |
| MTR-ST-42-48S-AB | | | | | | 94 | | | |
| MTR-ST-57-48S-AA | 56.4 | 47.14 | 6.35 | 38.1 | ∅ 5 | 107 | 20.6 | 1.6 | 5 |
| MTR-ST-57-48S-AB | | | | | | 128 | | | |
| MTR-ST-87-48S-AA | 85.8 | 69.6 | 11 | 73.025 | ∅ 6.6 | 156 | 27 | 2 | 10 |
| MTR-ST-87-48S-AA | | | | | | 176 | | | |

-  - Type discontinued
Available up until 2008

Stepper motors MTR-ST

Technical data

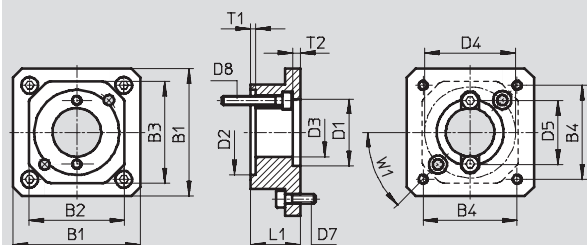
FESTO

Dimensions

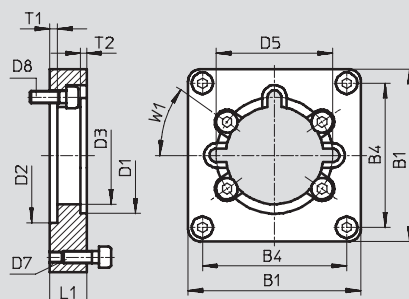
Download CAD data → www.festo.com

Motor flange

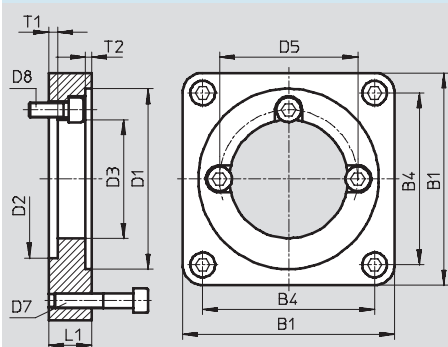
MTR-FL28-ST42



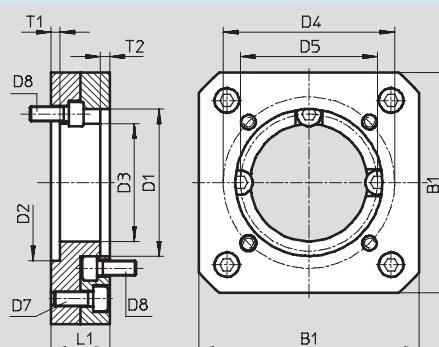
MTR-FL30-ST42 / MTR-FL44-ST57 / MTR-FL44-ST87



MTR-FL64-ST87



MTR-FL64-PL80



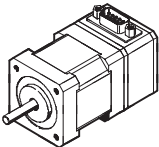
| Type | B1 | B2 | B3 | B4 | D1 ∅ G7 | D2 ∅ H7 | D3 ∅ | D4 ∅ | D5 ∅ | D7 | D8 | L1 | T1 | T2 | W1 |
|---------------|------|------|------|-------|---------------|---------------|---------|---------|---------|----|----|------|-----|-----|-----|
| MTR-FL28-ST42 | 42 | 31.5 | 33.5 | 31 | 22 | 28 | 16 | 30 | 21 | M3 | M3 | 16.5 | 1.8 | 2.5 | 45° |
| MTR-FL30-ST42 | 42 | - | - | 31 | 22 | 30 | 16 | - | 26.2 | M3 | M3 | 18 | 4.6 | 2.5 | 30° |
| MTR-FL44-ST57 | 56.4 | - | - | 47.14 | 38.125 | 44 | 32 | - | 38 | M4 | M4 | 12 | 2.5 | 2 | 35° |
| MTR-FL44-ST87 | 85.8 | - | - | 69.6 | 73.05 | 44 | 32 | - | 38 | M6 | M4 | 15.5 | 2.5 | 2.5 | 35° |
| MTR-FL64-ST87 | 85.8 | - | - | 69.6 | 73.05 | 64 | 48 | - | 56 | M6 | M6 | 17.5 | 3.8 | 2.5 | - |
| MTR-FL64-PL80 | 90 | - | - | 69.6 | 60 | 64 | 48 | 70 | 56 | M6 | M6 | 24 | 3.6 | 4 | - |

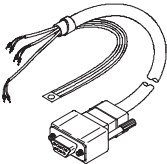
- 1 - Type discontinued
Available up until 2008


FESTO

Stepper motors MTR-ST

Technical data

| Ordering data for motor MTR...-ST-... | | | |
|---|-------------------|----------|------------------|
| | | Part No. | Type |
|  | MTR-ST-42-48S-... | 530 057 | MTR-ST-42-48S-AA |
| | | 530 058 | MTR-ST-42-48S-AB |
| | MTR-ST-57-48S-... | 530 061 | MTR-ST-57-48S-AA |
| | | 530 062 | MTR-ST-57-48S-AB |
| | MTR-ST-87-48S-... | 530 065 | MTR-ST-87-48S-AA |
| | | 530 066 | MTR-ST-87-48S-AB |
| | | 530 067 | MTR-ST-87-48S-GA |
| | | 530 068 | MTR-ST-87-48S-GB |

| Ordering data for cable KMTR-ST-... | | | | |
|---|----------------------------|----------|------------|----------------------|
| | | Part No. | Type | Cable length |
|  | Motor cable KMTR-ST-... | 530 071 | KMTR-ST-5 | 5 m |
| | | 530 072 | KMTR-ST-10 | 10 m |
| | | 530 073 | KMTR-ST-X | X length (max. 25 m) |

| Ordering data for flange MTR-FL-... | | | |
|---|--------------|----------|----------------|
| | | Part No. | Type |
|  | MTR-FL28-... | 530 080 | MTR-FL28-ST42 |
| | MTR-FL30-... | 530 079 | MTR-FL30-ST42 |
| | MTR-FL44-... | 530 081 | MTR-FL44-ST57 |
| | | 530 082 | MTR-FL-44-ST87 |
| | MTR-FL64-... | 533 140 | MTR-FL64-ST87 |
| | | 533 139 | MTR-FL64-PL80 |

-  - Type discontinued
Available up until 2008

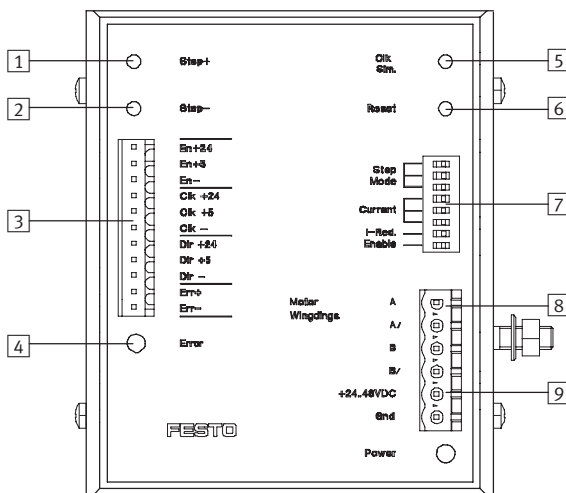
Motor controller SEC-ST, for stepper motors

Technical data

FESTO



Explanation of the functions/interfaces



- 1 "Step +" button
- 2 "Step -" button
- 3 Plug X1 for control cable (step, direction, etc.)
- 4 LED, indicates an error
- 5 "CLK, Sim." button
- 6 "Reset" button
- 7 DIP switch for setting the operating mode, current value and current reduction
- 8 Plug X2 for motor connection
- 9 Plug X3 for supply voltage

| General electrical data | | SEC-ST-48-6-P01 |
|---|--------|--|
| Nominal operating voltage V_{nominal} | [V DC] | 24 ... 48 |
| Nominal current (adjustable) I_{nominal} | [A] | 1.25 ... 6 via DIP switch |
| Max. step frequency | [kHz] | 40 |
| Current reduction (adjustable) | [%] | 0 or 70 via DIP switch |
| Operating range Logic input | [V DC] | 12 ... 30 |
| System mode | | Bipolar chopper driver |
| Operating mode | | Full step = 200 steps/revolution Half step = 400 steps/revolution (recommended) Quarter step = 800 steps/revolution Fifth step = 1000 steps/revolution Eighth step = 1600 steps/revolution Tenth step = 2000 steps/revolution Thirty-second step = 6400 steps/revolution |
| Step adjustment | | Via DIP switch |

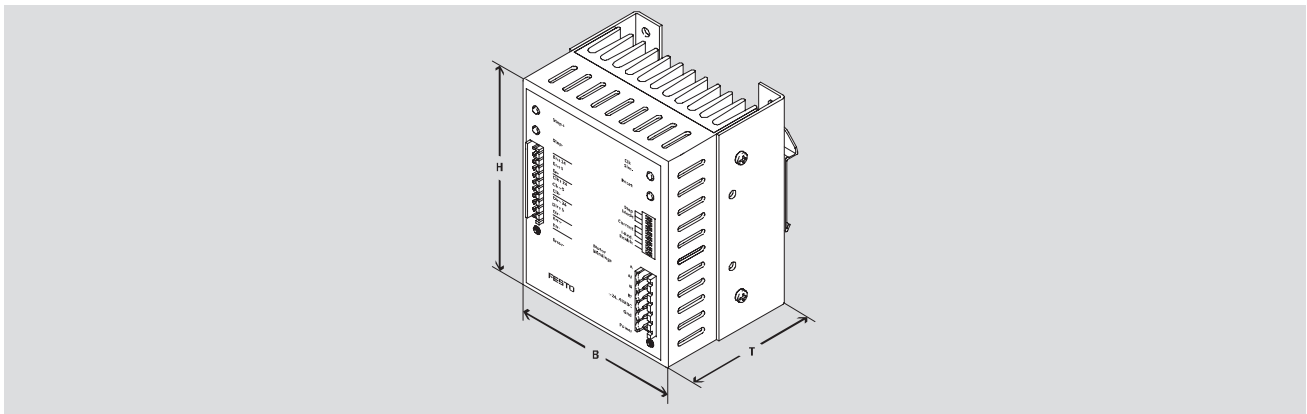
- 2 - Type discontinued
Available up until 2008

Motor controller SEC-ST, for stepper motors

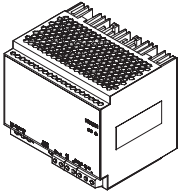
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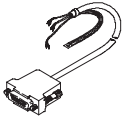
Technical data and accessories

| Operating and environmental conditions | |
|--|-------------------------------------|
| Ambient temperature [°C] | 0 ... +40 |
| Storage temperature [°C] | -10 ... +60 |
| Weight [g] | 660 |
| Protection class | IP20 |
| CE symbol (declaration of conformance) | In accordance with EU EMC Directive |
| Connection type | Screw terminal |
| Type of mounting | TS 35 DIN H-rail |



| Dimensions and ordering data | | | | | |
|------------------------------|-----|----|----|----------|-----------------|
| | H | W | D | Part No. | Type |
| Motor controller | 106 | 89 | 70 | 548 945 | SEC-ST-48-6-P01 |

| Ordering data for accessories | | | | | | |
|---|-----------------------------------|----------------------------|-----------------------|---------------------|----------|--------------------------------|
| | Brief description | Input voltage range [V AC] | Output voltage [V DC] | Nominal current [A] | Part No. | Type |
| Power supply unit | | | | | | Technical data → Internet: svg |
|  | Power supply for motor controller | 100 ... 240 | 48 | 5 | 542 403 | SVG-1/230VAC-48VDC-5A |
| | | | | 10 | 542 404 | SVG-1/230VAC-48VDC-10A |
| | | 400 ... 500 | | 20 | 542 405 | SVG-3/400VAC-48VDC-20A |

| Ordering data | | | |
|---|--|----------|----------------|
| | Brief description | Part No. | Type |
|  | Control cable for connecting to the axis controller SPC200 Cable length 1.5 m | 530 077 | KSPC-SECST-1,5 |

Product Range and Company Overview

A Complete Suite of Automation Services

Our experienced engineers provide complete support at every stage of your development process, including: conceptualization, analysis, engineering, design, assembly, documentation, validation, and production.



Custom Automation Components
Complete custom engineered solutions



Custom Control Cabinets
Comprehensive engineering support and on-site services



Complete Systems
Shipment, stocking and storage services

The Broadest Range of Automation Components

With a comprehensive line of more than 30,000 automation components, Festo is capable of solving the most complex automation requirements.



Electromechanical
Electromechanical actuators, motors, controllers & drives



Pneumatics
Pneumatic linear and rotary actuators, valves, and air supply



PLCs and I/O Devices
PLC's, operator interfaces, sensors and I/O devices

Supporting Advanced Automation... As No One Else Can!

Festo is a leading global manufacturer of pneumatic and electromechanical systems, components and controls for industrial automation, with more than 12,000 employees in 56 national headquarters serving more than 180 countries. For more than 80 years, Festo has continuously elevated the state of manufacturing with innovations and optimized motion control solutions that deliver higher performing, more profitable automated manufacturing and processing equipment. Our dedication to the advancement of automation extends beyond technology to the education and development of current and future automation and robotics designers with simulation tools, teaching programs, and on-site services.

Quality Assurance, ISO 9001 and ISO 14001 Certifications

Festo Corporation is committed to supply all Festo products and services that will meet or exceed our customers' requirements in product quality, delivery, customer service and satisfaction.

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