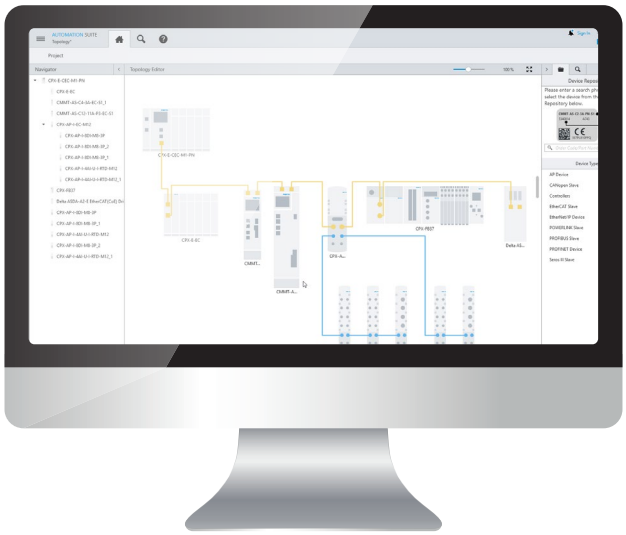
Servo drive CMMT-AS/CMMT-ST and servo motor EMMT-AS/EC



Perfectly integrated!

Highlights

- High-performance CMMT-AS and extremely economical CMMT-ST on one platform
- All fieldbuses in one hardware
- Ideal with CPX-E or direct integration in control concepts from third-party suppliers
- Quick commissioning of the complete drive system in just a few steps
- Optimised operation, diagnostics and data backup
- Design and connections optimised for control cabinets
- Integration of CMMT and EMMT into the Handling Guide Online
- Extended security functions are available

The benefits of the servo drives CMMT-AS/ST and servo motors EMMT-AS/EC are numerous: maximum connectivity of the hardware and software, great efficiency, clever engineering and easy operation. Dynamic motion and precise positioning, whether for point-to-point or interpolation, are additional plus points. Last but not least, the complete system is extremely quick and easy to commission.

Very well connected
In sectors ranging from assembly and handling technology to packaging systems and the electronics industry, CMMT-AS and CMMT-ST are perfect for working together with the control systems CPX-E. The ability to connect the fieldbus directly to all controllers of the main manufacturers makes it easy to integrate the CMMT into all application programs.

Quickly ready for work
Parameterisation and programming with the Festo Automation Suite software are easy.

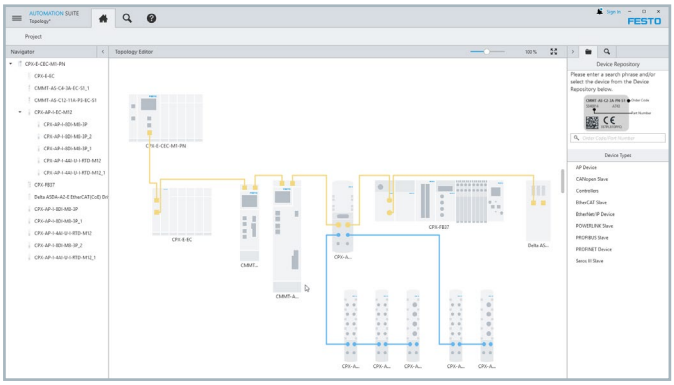
Only five steps are needed to commission the complete drive system with the commissioning wizard.

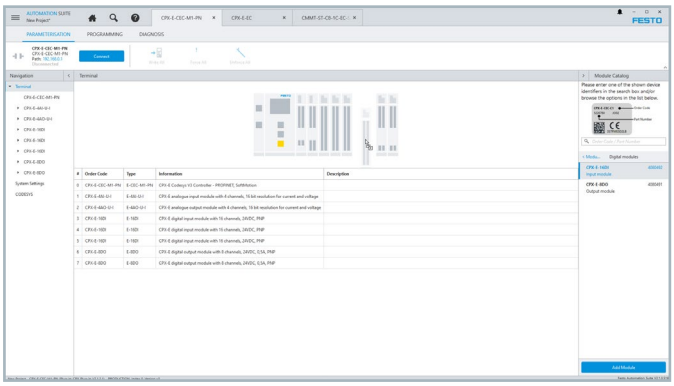
1 cable – less space required
The servo motor EMMT-AS/EC is connected to the CMMT-AS/ST using one cable plug (OCP); this reduces installation and saves space. The CMMT-AS/ST is an open system for economical servo motors and simple cabling and connection technology – particularly interesting for the electronics industry and small parts assembly.

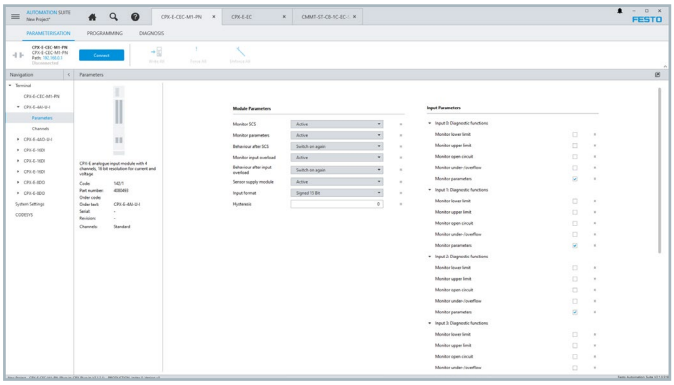
From the mechanics to the controller: the drive system from Festo

Installation and control concepts influence each other. This means that architectures must be cleverly networked to achieve complete connectivity. Hardware and software, from the mechanical system to the controller, work together intelligently on the Festo automation platforms.

The wide range of mechanical systems offers a solution for virtually any motion requirement. These mechanical systems are enhanced by optimally integrated servo drive systems comprising motors and state-of-the-art controllers. And the Festo Automation Suite software ensures quick and perfect commissioning of all hardware components.

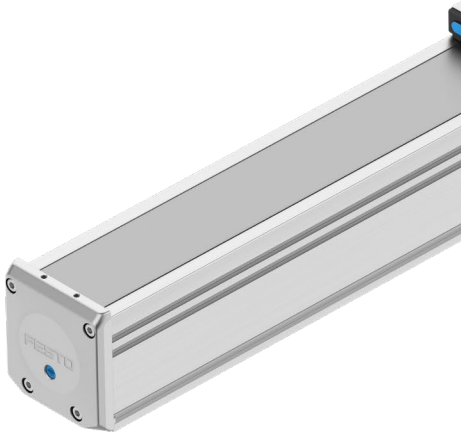






Easy to commission: Festo Automation Suite
The Festo Automation Suite is ideal for parameterising (incl. installation of the fieldbuses) and programming the complete drive system as well as for managing maintenance during operation. It enables you to find the right device plug-ins and extensions, whether for the mechanical or the control components, and install them securely and error-free using the software. It is also convenient since device information and instruction manuals can be accessed directly via the software.

Just a few steps and a few clicks to finish!
With the integrated commissioning wizard, you only need five steps to get a complete drive system that is ready for operation. And for the greatly simplified integration of the servo drives CMMT-AS and CMMT-ST into the control program with CPX-E-CEC you only need 2 clicks instead of 100 – the Festo Automation Suite takes care of everything else.



The integrated controller programming with CODESYS technology can be used for motion control and robotic functions.

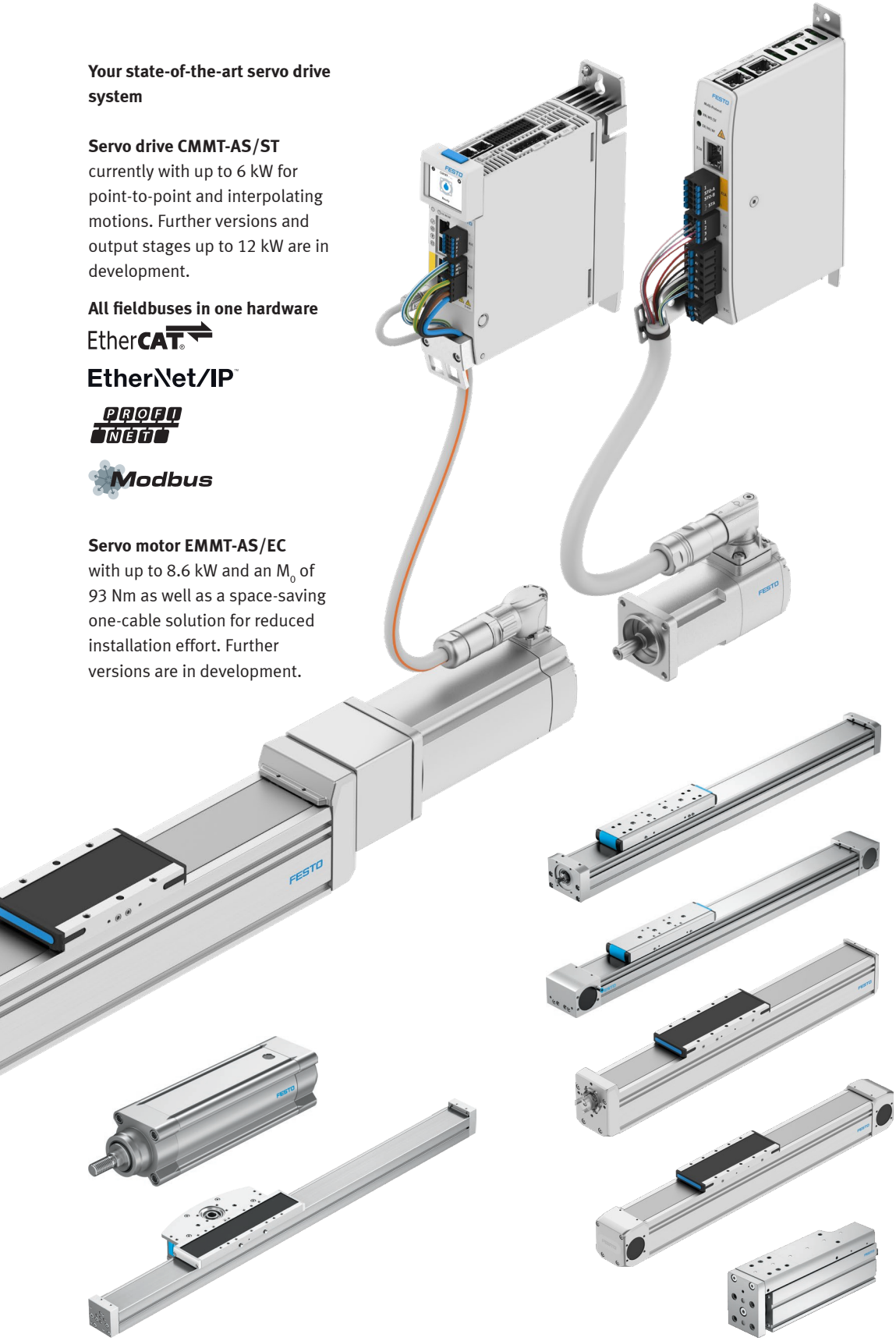
Your state-of-the-art servo drive system

Servo drive CMMT-AS/ST
currently with up to 6 kW for point-to-point and interpolating motions. Further versions and output stages up to 12 kW are in development.

All fieldbuses in one hardware

EtherCAT
EtherNet/IP
PROFINET
Modbus

Servo motor EMMT-AS/EC
with up to 8.6 kW and an M_0 of 93 Nm as well as a space-saving one-cable solution for reduced installation effort. Further versions are in development.



One portfolio of servo motors and linear mechanical systems for virtually every type of motion

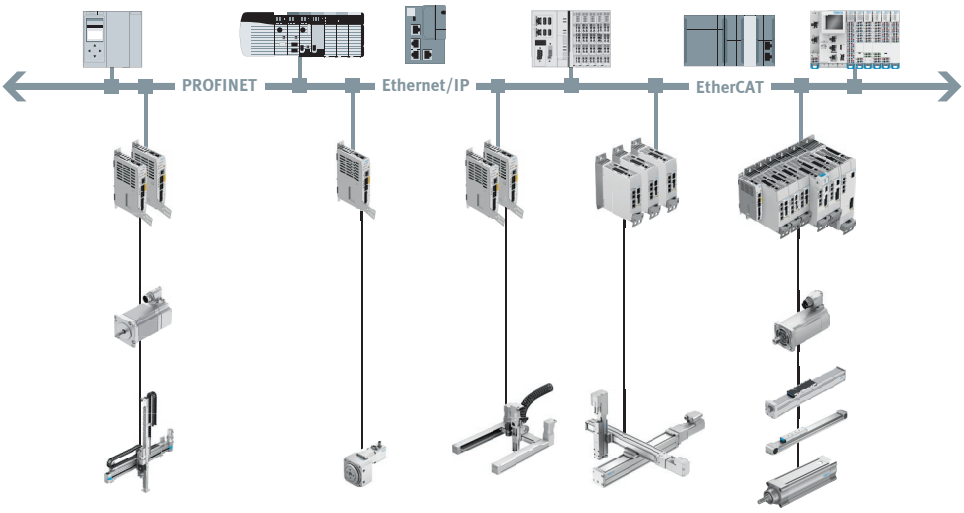
Servo motors
Dynamic servo motors with single-turn or multi-turn encoder:
- EMME-AS: powerful for dynamic positioning tasks
- EMMB-AS: economical and compact for simple positioning tasks

Axis mechanisms
- Precise ball screw axes with repetition accuracy up to ±20 µm
- Dynamic toothed belt axes up to 10 m/s and for strokes of up to 8.5 m
- Extremely precise and powerful mini slides ±15 µm
- Electric cylinder with feed force of up to 17 kN
- Rigid and dynamic cantilever axis with up to 2 m stroke
- Variants up to 100 kN in preparation

From the mechanics to the controller: the drive system from Festo

Festo drive systems for integrated control concepts

Third-party systems can also be connected directly and simply – with the complete range of functions.



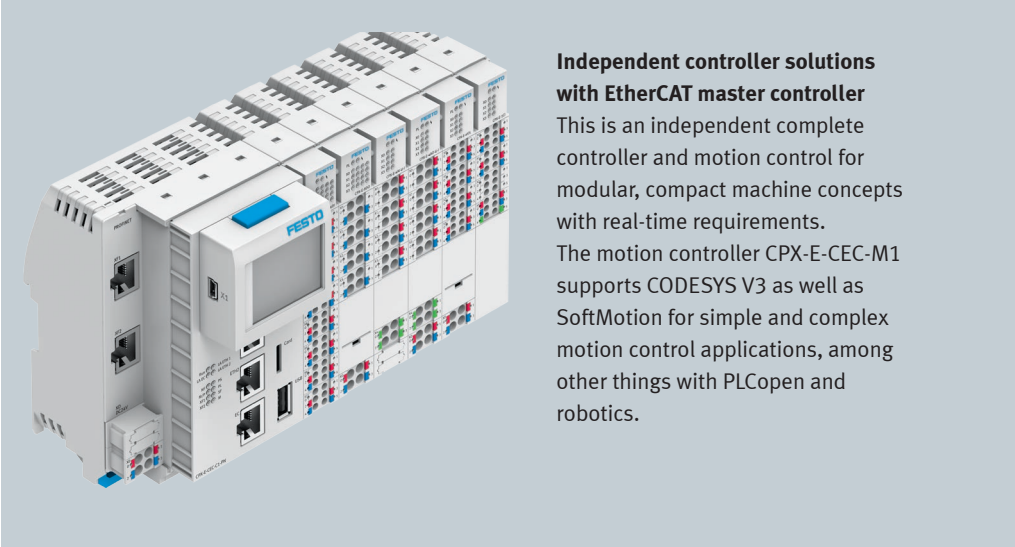
Complete connectivity

Multiple flexible controller concepts are based on the Festo automation platform. Its trademark is the perfect and complete connectivity of controller, servo drive and mechanical system.

System integration with a third-party supplier? Not a problem.

You can integrate the servo drive CMMT-AS and CMMT-ST directly into the system environment of third-party suppliers. CMMT will function just like the servo drive of the controller supplier. The identical response means that no drive-specific expertise is required for the CMMT. The complete drive system comprising closed-loop controller, motor and mechanical system is perfectly integrated.

The prerequisite: EtherNet-based protocols such as PROFINET, EtherNet/IP, EtherCAT® or Modbus. Function blocks for manufacturers such as Festo, Siemens, Rockwell, Beckhoff and Omron are available.



Independent controller solutions with EtherCAT master controller

This is an independent complete controller and motion control for modular, compact machine concepts with real-time requirements.
The motion controller CPX-E-CEC-M1 supports CODESYS V3 as well as SoftMotion for simple and complex motion control applications, among other things with PLCopen and robotics.

Festo for small and medium production plants or subsystems

The controller CPX-E from Festo is the basis for compact or modular automation solutions. These can control smaller and medium-sized stand-alone production plants or subsystems. Open-loop controller, motor, closed-loop controller and mechanical system form the optimum technical and economical combination.

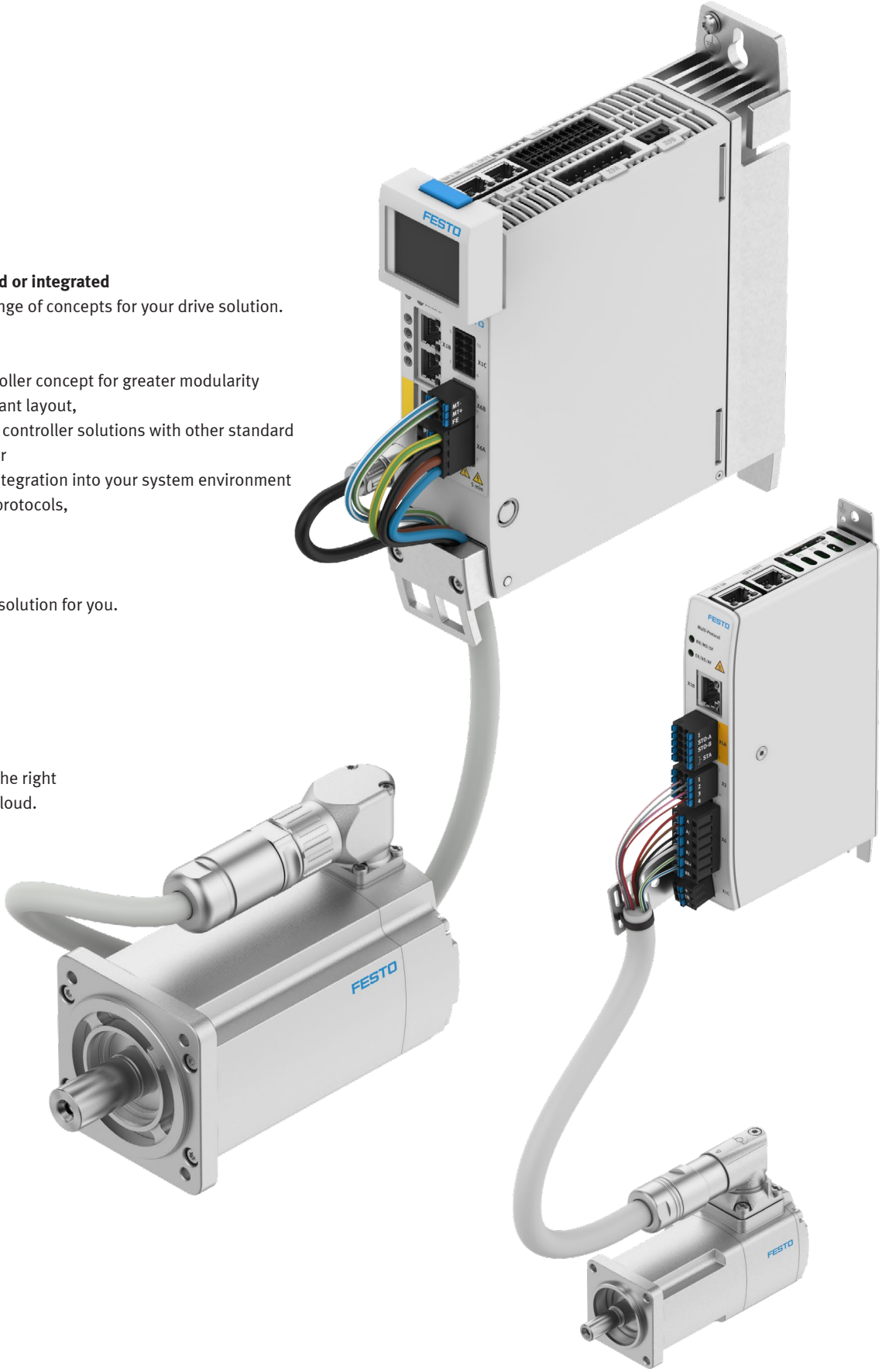
Independent, networked or integrated
Festo offers a unique range of concepts for your drive solution. Whether it's

a. an independent controller concept for greater modularity and freedom in the plant layout,
b. perfect networking of controller solutions with other standard controller concepts, or
c. a perfect, seamless integration into your system environment with Ethernet-based protocols,

anything is possible.

We will create the ideal solution for you.

Or in the cloud?
Implement tomorrow's automation today with the right Festo solutions for the cloud.

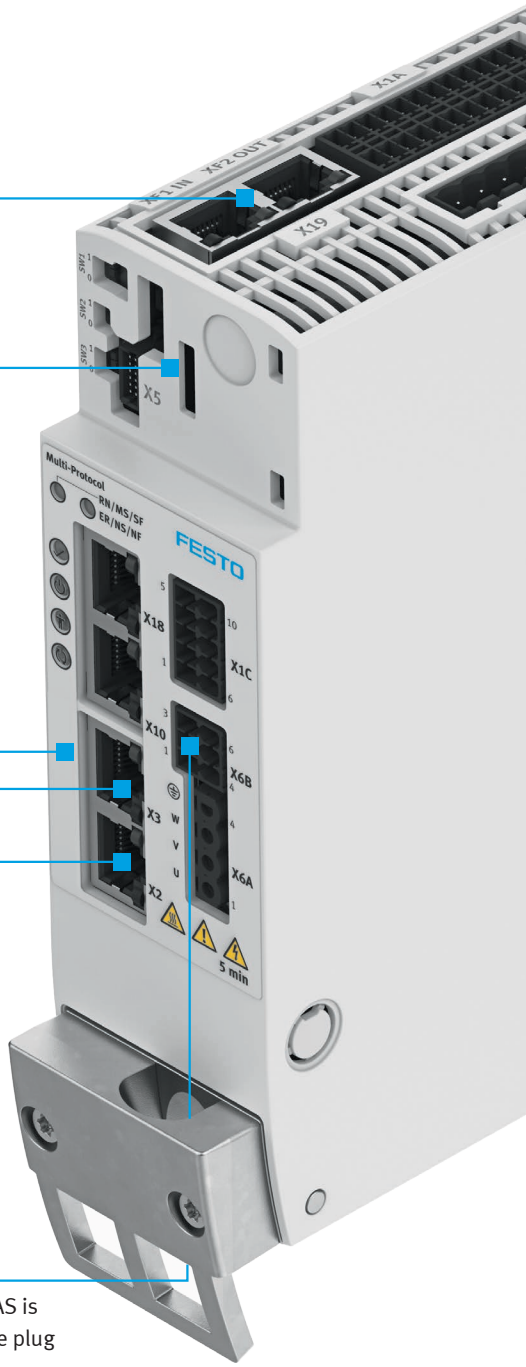


The servo drive CMMT-AS at a glance

The state-of-the-art, price- and size-optimised, compact servo drive CMMT-AS is an integral part of the automation platform from Festo. Suitable for point-to-point and interpolating motions, CMMT-AS can be commissioned with the Festo Automation Suite in just a few steps – with no errors! The closed-loop controller is suitable for different Ethernet-based bus systems and can be smoothly integrated into the controller environments of various manufacturers. The required controller-specific function elements are included.

Ethernet-based communication
- 1 servo drive platform for numerous fieldbuses
- With the multiprotocol device, all available fieldbuses are contained in one piece of hardware
- Easily integrated into automation solutions with controllers from Siemens, Rockwell, Beckhoff and others

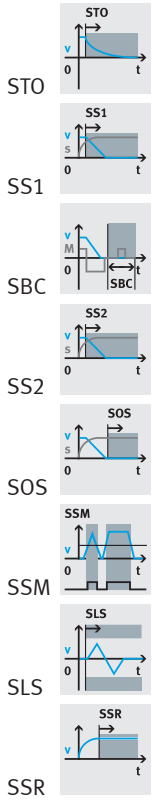
Operator unit CDSB
- Control element with touchscreen and USB interface
- Simple, full-text diagnostics and setting of the closed-loop controller on site
- Ideal for data backup of parameters and firmware
- 1 CDSB can be used for several CMMT-AS. For example, on series machines the same program data can be downloaded to several CMMT-AS.



Compact design
- All connections and the control unit CDSB are at the front and on top of the closed-loop controller.
- Compact and optimised cooling element ensures adequate cooling.

Encoder interfaces
- Multi-encoder input for motors
- Formats: ENDAT2.1/2.2 (One Cable), HIPERFACE, Nikon
- Input for 2nd encoder
  - For safety-oriented 2-channel solutions with redundant measuring system
  - For greater positioning accuracy of the axis mechanism
  - For special applications (e.g. flying saws)
  - Synchronisation of two axes
  - CMMT-AS as external encoder module – saves on an additional encoder module and reduces costs
  - Formats: ENDAT2.2, Nikon, A/B and SIN/COS-incremental

Motor connection
- The servo motor EMMT-AS is connected with one cable plug (OCP).
- Other servo motors are connected with separate cables.



Integrated safety and reliability

- Standard protective functions:
  - STO: Safe torque off (SIL3/Cat. 4 PL e)
  - SS1: Safe stop 1 (Type c) when using a suitable external safety relay unit and suitable circuits
  - SBC: Safe brake control (up to SIL3/Cat. 3 PL e)
  - Diagnostic outputs STA and SBA for feedback of the active safety function
- Other supported security functions (SIL3/Kat. 4 PL e):
  - SS2: Safe Stop 2
  - SOS: Safe Operating Stop
  - SSM: Safe Speed Monitoring
  - SLS: Safe Limited Speed
- Extended safety function SSR (safe speed range)
- Interfaces:
  - I/O interface
  - ProfiSafe
  - FSoE (in preparation)
  - CIP Safety (in preparation)
- Standard safety functions can be configured without software
- Guided commissioning of the safety functions with subsequent validation wizard in the Festo Automation Suite

Intermediate circuit coupling

- Return energy feed via the intermediate circuit
- Simple and inexpensive energy compensation between drives
- Improved energy efficiency

Mains filter

- Mains filter integrated as standard
- Ensure reliable operation of the CMMT-AS under poor EMC conditions
- Saves additional external mains filters, reduces installation time and saves space in the control cabinet

Function elements

- Easily integrated into automation solutions from Siemens, Rockwell, Beckhoff and others
- Quick implementation of point-to-point motions and interpolating motions with standard drive profiles such as PROFIdrive and CiA402
- Convenient usage of typical PLC functions such as E-Camming Editor, NC-axes, technology objects and kinematics models

Parameter sets

Optimal parameters for optimised cycle times and process reliability

- Save up to three parameter sets on the closed-loop controller for complex applications
- Parameter set can be changed during operation
- Easy implementation of new requirements for the machine sequence
- The correct closed-loop parameters are used at all times, even with variable payloads

The servo drive CMMT-ST at a glance

The extra-low voltage servo drive CMMT-ST represents highly economical positioning tasks and motion solutions with low power requirements up to 300 W. Even more compact and significantly less expensive than its big brother, the CMMT-AS, while the connection and communication concept, function modules and standard safety remain the same. The consistent control concept means that, as a drive, the CMMT-AS and CMMT-ST can be easily combined with both large and small axes.

Ethernet-based communication
- 1 servo drive platform for numerous fieldbuses
- With the multiprotocol device, all available fieldbuses are contained in one piece of hardware
- Easily integrated into automation solutions with controllers from, for example, Siemens, Rockwell, Beckhoff and others

EtherCAT PROFINET EtherNet/IP Modbus

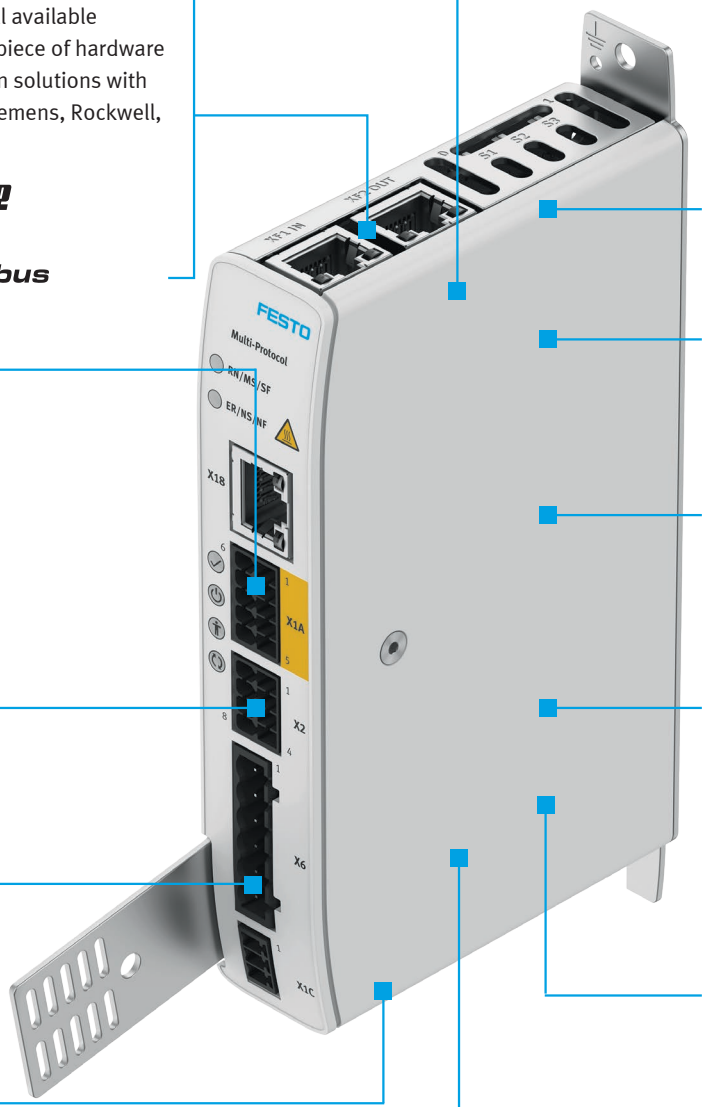
Integrated standard safety
- STO: torque can be safely switched off (SIL3/cat. 3 PL e)
- SS1: safe stop 1 (type c) when using a suitable external switching device and a suitable circuit
- Configuration without software possible

Encoder interface
- For greater positioning accuracy of the axis mechanism
- BiSS-C and incremental

Motor connection
- Optimal with the new stepper motors EMMB-ST and EMMT-ST from Festo
- Suitable for BLDC (brushless DC) motors, e.g. EMMT-EC from Festo

Technical data
- Max. continuous output: 300 W
- Peak output: 800 W
- Primary voltage: 24...48 V DC
- Motor current: 8 A/peak 20 A

Commissioning
- Commissioning with the Festo Automation Suite is error-free and takes just a few steps.



Extremely compact
- 50% more compact than the smallest CMMT-AS with almost the exact same performance

Energy management strategy
- for the recuperation of energy

Dynamic movement and precise positioning
- Point-to-point
- Interpolating

Web server
- Simple and fast online diagnostics
- Transfer and update firmware and parameters

Project planning
- The Electric Motion Sizing quickly and reliably leads to the optimum drive package
- Seamless transition to commissioning and inclusion of all necessary parameters in one single file

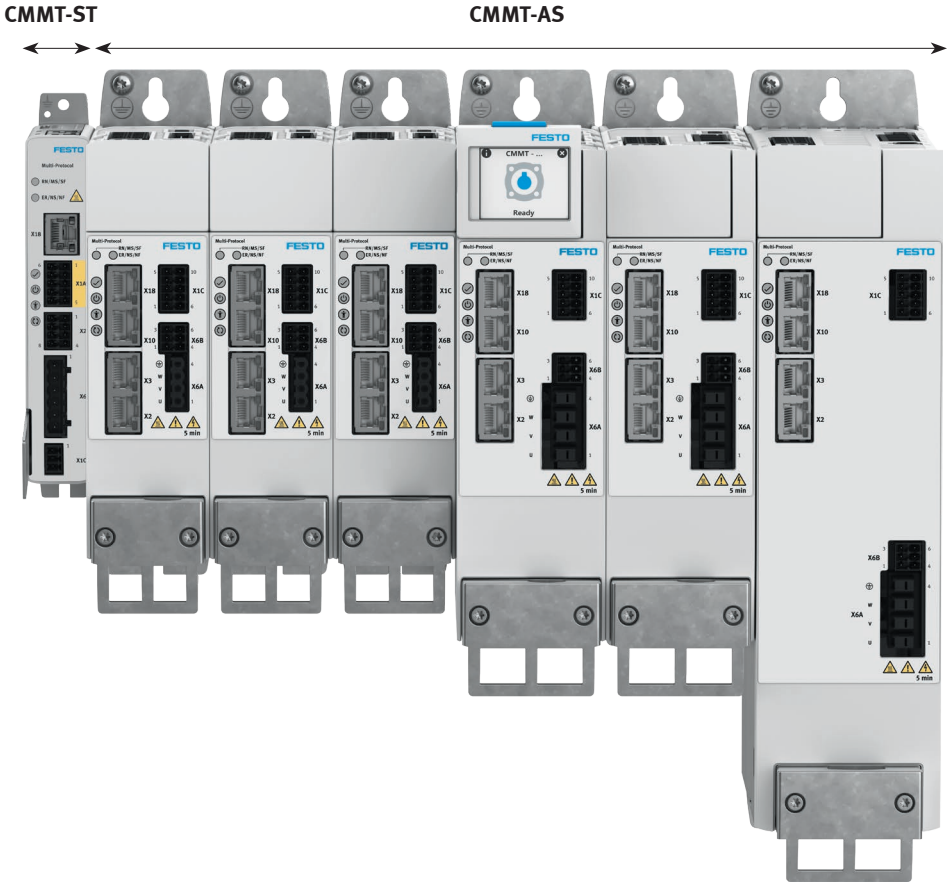
Parameter sets
- Optimal parameters for optimised cycle times and process reliability
- Save up to three parameter sets on the drive for complex applications
- The parameter set can be changed during operation

Tipp:
When operating the CMMT-ST with the existing 24 V DC network in a control cabinet and a continuous output of 150 W, there is no need for an extra power supply unit. This saves on additional costs, reduces the installation effort and reduces the required cooling capacity.

The power spectrum of the CMMT-AS thus ranges from below 50 W up to a continuous output of 300 W and a peak output of 800 W at 48 V DC

Compactness and power in one package: CMMT-AS and CMMT-ST

It may be one of the smallest among its competitors, but the extremely compact servo drive series CMMT is still very powerful in all sizes. All servo drives can be installed directly in series. The intelligent design has the same operating and connection concept for all sizes, which really simplifies installation and operation. In addition, the optimised cooling element also ensures outstanding cooling, even when several drives are connected together.



The complete range of servo drives
- CMMT-ST with up to 300 W of continuous output
- CMMT-AS from 350 W up to 12 kW continuous output

Compact, easily installed, easily connected
- Space-saving in the control cabinet
- All connections and the control unit CDSB are at the front and on top of the drive
- Its extremely compact size makes it one of the smallest servo drives compared to its competitors
- Simplified installation effort, requiring much less time for the connections
- Unique high-density assembly of the drive thanks to the easy series connection
- Virtually perfect ratio of size and performance, such as with the compact, optimised cooling element and the position of the connections
- Extremely effective cooling performance even with high component density

Combining low-voltage and extra-low voltage servo drives for high performance and excellent economic efficiency

The servo drives CMMT-AS (low voltage servo drive) and CMMT-ST (extra-low voltage servo drive) are characterised by a common platform concept. They can be easily combined so that individual movements of the application can be optimally designed and operated. The CMMT-ST covers the power spectrum from below 50 W up to 300 W and the CMMT-AS enables a power output between 350 W and 12 kW.

The same fieldbus interfaces and the seamless, consistent integration into the system environment of the controller manufacturer offer simple and convenient project engineering and handling of the entire servo drive family.
At the same time, the required space in the machine, and especially in the control cabinet, is minimal.

Servo motors and stepper motors from Festo

Wherever there is a need for automating motion in industrial applications, Festo has the solution with servo motors and stepper motors for every requirement. Motor characteristics extend from maximum economy to maximum performance.

Servo motor EMMT-AS/EC

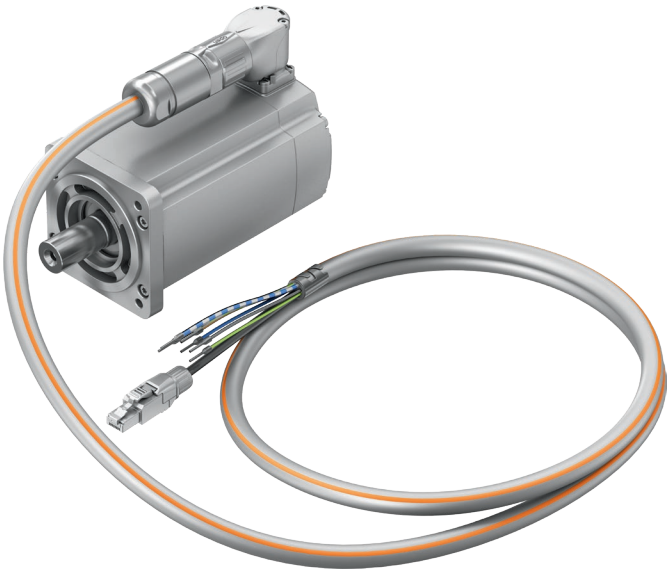
The AC synchronous servo motor for demanding and dynamic applications is noted for an extremely low standstill torque. This ensures good adjustability and tracking accuracy with positioning tasks. The "electronic rating plate" contains all the important motor data. It can be read by the servo drive CMMT-AS and thus the parameters for the servo motor will be automatically set. This makes commissioning child's play – and totally reliable. The new EMMT-EC brushless motor harmonizes perfectly with the proven CMMT-ST low-voltage controller.

- 6 sizes with flange sizes 40 to 190 and 151 W up to 8.6 kW or M0 from 0.28 to 93 Nm
- Single-turn, multi-turn absolute encoder, safe multi-turn encoder
- With or without holding brake
- Degree of protection IP67 for motor housing incl. connection technology
- Degree of protection for shaft:
  - Standard: IP40
  - With sealing ring suitable for unlubricated operation: IP65
- Temperature measurement integrated in motor, interference-proof and digital transmission via the encoder protocol
- Smooth, painted surface that is dirt-resistant and easy to clean

Space-saving: one cable plug with the EMMT-AS/EC

The space-saving one cable plug (OCP) requires much less installation effort. The servo motor is connected with only one cable for power, encoder signals and holding brake. This simplifies wiring and replacement.

- It is suitable for transmission of high electrical power
- Robust and durable for dynamic applications, e.g. in cable chains
- Long cables for distances up to over 50 m
- Cable lengths up to 100 m with improved protection against interference are possible



Servo motors EMMB-AS

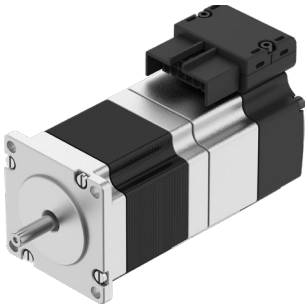
This compact and particularly economical synchronous servo motor in four power classes from 100 up to 750 W is perfect for simple positioning tasks, particularly in the electronics industry and small parts assembly as well as in test stations.

- Single-turn encoder, optional: multi-turn with battery adapter
- Optional holding brake
- Motor, brake and encoder cables with optimised connection technology
  - 2.5 ... 25 m
  - Optional: versions suitable for energy chains
- Degree of protection:
  - IP65 for motor housing and cable connections
  - IP50 on the motor shaft without and IP54 with shaft seal ring
- Compatible with shafts and flanges on the EMMT-AS

Stepper motors EMMB-ST (Basic Line)

Cost-effective, particularly suitable for series machine builders and in the electronic and light assembly for applications with basic requirements.

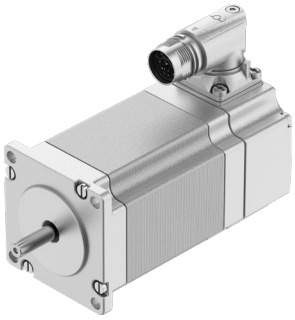
- Absolute encoder, single or multiturn (without battery)
- With or without holding brake
- 3 flange sizes M_H: 0.22 ... 5.3 Nm
- EMMB-ST-42-S / L, -57-M / L, -87-S / M
- Motor flange and shaft sizes NEMA 17 / 23 / 34
- OCP cable (one cable plug) with space-saving plug, can be positioned to the front or rear
- Motor in IP20, without UL certification (shaft IP40)
- Electronic rating plate with motor correction table
- Cable length of up to 25 m
- List price saving compared to predecessor EMMS-ST: 30 ... 40 %



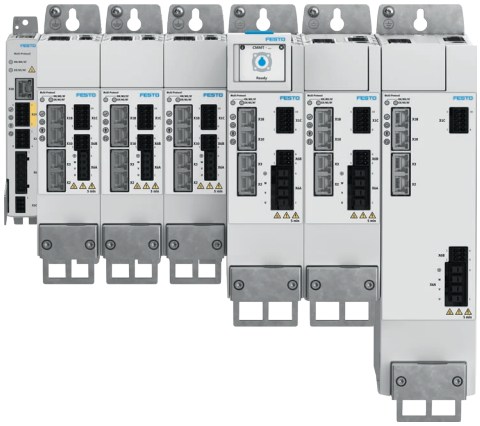
Stepper motors EMMT-ST (Technology Line)

For higher IP rate requirements and solid connectivity, with UL approval.

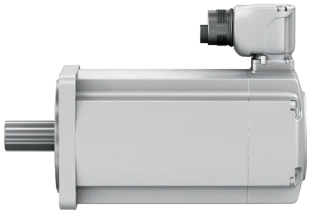
- Absolute encoder, single or multiturn (without battery)
- With or without holding brake
- 3 flange sizes
- MH: 0.22 Nm ... 9.3 Nm
- EMMT-ST-42-S / L, -57-M / L, -87-S / M / L
- Motor flange and shaft sizes NEMA 17 / 23 / 34
- OCP cable (one cable plug) with solid M17 plug, rotatable 310°
- Motor in IP65 and with UL certification (shaft IP40)
- Electronic rating plate with motor correction table
- Cable length of up to 25 m
- List price saving compared to predecessor EMMS-ST: 10 ... 25 %



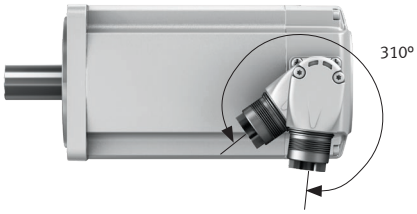
Servo drive CMMT-AS/ST
and servo motor EMMT-AS/EC at a glance



Servo drive CMMT-AS and CMMT-ST including control unit CDSB



Servo motor EMMT-AS in size 80



Rotatable plug with adjustable angle

Important technical data	CMMT-AS and EMMT-AS	CMMT-ST and EMMT-EC/ST / EMMB-ST
Applications	Point-to-point and interpolating motions	
Nominal power	Single-phase 230 V: 0.35/0.7 kW Three-phase 400 V: 0,8 / 1,2 / 2,5 / 4 / 6 / 9 / 12 kW	0,3 kW
Motor/motor flange size	40, 60, 80, 100, 150, 190	28, 40, 42, 57, 87
Communication	EtherCAT, PROFINET, EtherNet/IP, Modbus I/O interface, ProfiSafe, FSoE *, CIP Safety *	
Safety functions	STO, SBC, SS1, SS2, SOS, SMS,SLS, SSR	STO, SS1
Multi-encoder input motor additional encoder input	ENDAT2.1/2.2 (one cable), HIPERFACE, Nikon ENDAT2.2, Nikon, A/B- and SIN/COS incremental	BiSS C and incremental
Mains filter	Integrated	
Intermediate circuit coupling	Yes	Yes
Engineering Commissioning Programming	Electric Motion Sizing Festo Automation Suite (including first commissioning wizard) CODESYS	
Motor connection	One cable plug (OCP) on EMMT-AS with rotatable plug (310° adjustable angle) Max. cable length 50 m (100 m with optimised protection against interference)	Motor and encoder cable Max. cable length 25 m
Motor options	Single-turn encoder, multi-turn encoder, safe multi-turn encoder; brake, feather key, rotary shaft seal	Stepper motors and BLDC motors, single / multi turn encoder or without encoder, brake

* in preparation

Find the right electric or electromechanical servo drive.
This is how you can quickly and easily find the right electromechanical drive solution for your application:
Electric Motion Sizing, the online sizing and simulation tool for electric drives (servo drives and motors = servo drive package) as well as for electromechanical drive solutions (= electromechanical servo drive package consisting of servo drives and motors as well as mechanics) helps you do this.
Now with the servo drives CMMT-AS and CMMT-ST as well as the servo motors EMMT-AS/EC – with downloadable parameter records for easy commissioning.

This tool can be found at
➔ **www.festo.com/x/electric-motion-sizing**

135954 en 2025/01 – Errors and omissions excepted