Servo drives CMMT-ST, for extra-low voltage

FESTO

Key features

At a glance

- Space-saving servo drive for operating stepper motors and brushless direct current motors
- Extremely economical for positioning tasks and motion solutions with low power requirements up to 300 W
- Primary voltage from 24 ... 48 V DC
- Motor current from 8 A (peak 10 A)
- 50% more compact than the smallest CMMT-AS
- Options for point-to-point and interpolating motion and for precise positioning
- Bus protocols

- Direct fieldbus integration to major controller manufacturers
- Auto-tuning supports simple commissioning of rotary and linear movements, using mechanical systems from Festo and third-party suppliers
- Integrated safety functions:
  - Safe torque off (STO) up to SIL3/Cat. 3 PL e
  - Safe stop 1 time controlled (SS1-t) when using a suitable external safety relay unit and suitable circuitry for the servo drive
- Can be easily combined with the servo drive CMMT-AS and axis mechanisms from Festo

EtherCAT.   PROFINET®   EtherNet/IP®

The technology in detail
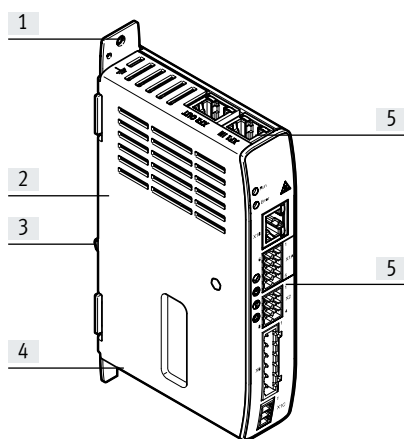
[1]   Hole for mounting the servo drive on the control cabinet back wall
[2]   Housing
[3]   Standard mounting via H-rail clamp
[4]   Elongated hole for adjustment during mounting
[5]   Connections

Library in EPLAN

EPLAN macros for fast and reliable planning of electrical projects in combination with servo drives, motors and cables. This enables a high level of planning reliability and standardisation of documentation without the need to create symbols, graphics and master data.
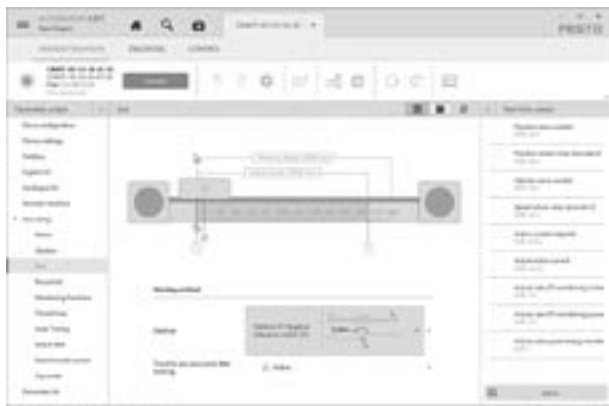
PositioningDrives
Configuring electromechanical drives

Create the optimum drive package quickly and reliably. PositioningDrives calculates suitable combinations of electric axis, electric motor and servo drive using just a few application details. You can sort the results according to your specifications and obtain all the relevant data including the bill of materials and documentation for the selected combination. This avoids design errors and results in significantly improved energy efficiency for the system.

EtherCAT®, PROFINET®, EtherNet/IP®, are registered trademarks of the respective trademark holder in certain countries.

Key features

Festo Automation Suite

- Parameterisation, programming and commissioning in a clear and user-friendly interface
- Optimum support for complex processes thanks to guided wizards (e.g. for commissioning, drive configuration, etc.)
- Fast access to the required documents and additional information
- Easy integration of electric drives in the controller programming

System overview
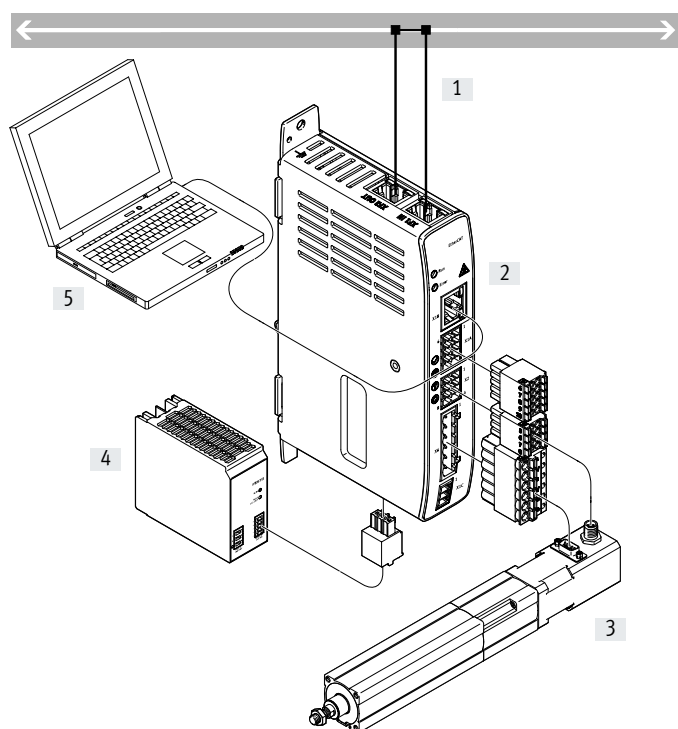
[1]   Bus/network
[2]   Servo drive CMMT-ST
[3]   Stepper motor or EC motor with drive
[4]   Power supply unit(s) for logic and load voltage (PELV)
[5]   PC with Ethernet connection for parameterisation

Type codes

001	Series	
CMMT	Motor controller	

002	Motor type	
ST	Stepper motor ST	

003	Nominal current	
C8	8 A	

004	Nominal input voltage	
1C	24 - 48 V DC	

005	Number of phases	
	Single-phase	

006	Bus protocol/activation	
EC	EtherCAT	
PN	PROFINET	
EP	EtherNet/IP	

007	Safety function	
S0	Basic safety	

NEW

Data sheet

Bus protocols

EtherCAT.

PROFI NET®

EtherNet/IP®

General technical data		
Type of mounting		Mounting plate, screwed in
		With H-rail
Display		LED green/yellow/red
Controller operating mode		Cascade controller
		P position controller
		PI speed controller
		PI current regulator for F or M
		Profile operation with record and direct mode
		Interpolating operation via fieldbus
		Synchronised operating modes
		Homing
		Set up mode
		Auto-tuning
		Open-loop operation
Operating mode		Field-oriented closed-loop control
		Position resolution 24 bit/rev.
		Sampling rate 20 kHz
		PWM with 20 kHz
		Real-time data acquisition
		2x input capture (x, v, F)
		2x output trigger (x, v, F)
		1x position encoder input
Adjustable current reduction		Via software
Protective function		I^2t monitoring
		Temperature monitoring
		Current monitoring
		Voltage failure detection
		Following error monitoring
		Software end-position detection
Mounting position		Free convection
		Vertical
Product weight	[g]	350

Data sheet

Bus protocols

Interface		EtherCAT	PROFINET RT/IRT	EtherNet/IP
Function		Bus connection incoming/outgoing		
Process interfacing		Interpolated mode CSP	AC1: Adjustable speed drives	Adjustable speed drives
		Interpolated mode CSV	AC3: Drives with positioning function	Drives with positioning function
		Interpolated mode CST	AC4: Synchronous servo application	
		I/O mode for 256 positioning records		
Communication profile		CiA402	PROFIdrive	DriveProfile
		CoE (CANopen over EtherCAT)	PROFIenergy	
		EoE (Ethernet over EtherCAT)		
		FoE (File over EtherCAT)		
Max. fieldbus transmission rate	[Mbps]	100		
Connection type		2 x socket		
Connection technology		RJ45		

Electrical data

Output connection data		
Output voltage range	[V AC]	0 – Input
Nominal output current	[A]	8
Nominal current per phase	[A]	8
Peak current per phase	[A]	10
Max. peak current duration	[s]	3
Nominal power	[W]	300
Peak power	[W]	400
Output frequency	[Hz]	> 600
Max. motor cable length[1]	[m]	25
Load voltage DC		
Load voltage range	[V DC]	24 −15% ... 48+15%
Max. DC link voltage	[V DC]	60
Logic supply		
Nominal voltage	[V DC]	24 ±15%
Max. current consumption		
Without locking brake	[A]	1
With locking brake	[A]	2
Holding brake		
Max. output current	[A]	1
Max. voltage drop	[V]	1

1) Without external mains filter

Data sheet

Interfaces		
Ethernet		
Function		Parameterisation and commissioning
Protocol		TCP/IP
Position encoder		
Function		Incremental encoder
		BiSS-C
Input/output		
Digital inputs		
Number		6
Number of high-speed		2
Time resolution of high-speed	[µs]	1
Switching logic		PNP
		NPN
Properties		Not galvanically isolated
		Freely configurable in some cases
		Safety inputs in some cases
Specification		Based on IEC 61131-2, type 3
Working area	[V]	−3 … +30
Digital outputs		
Number		2
Number of high-speed		2
Time resolution of high-speed	[µs]	1
Switching logic		PNP
		NPN
Properties		Not galvanically isolated
		Configurable
Max. current	[mA]	100
Floating switching outputs		
Number		1
Max. current	[mA]	100

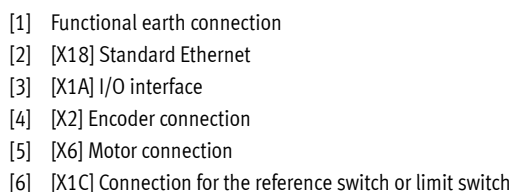# Data sheet

Safety data

Safety function to EN 61800-5-2	Safe torque off (STO)
	Safe stop 1 (SS1-t)
Performance level (PL) to EN ISO 13849-1	
Safe torque off (STO)	Category 3, PLd (EC motor without diagnostics)
	Category 3, PLe (stepper motor/EC motor with diagnostics)
Safety integrity level (SIL) to EN 62061 and EN 61508	
Safe torque off (STO)	SIL 2 / SILCL 2 (EC motor without diagnostics)
	SIL 3 / SILCL 3 (stepper motor/EC motor with diagnostics)
Certificate issuing authority and no.	German Technical Control Board (TÜV Rheinland) 01/205/5696.00/19
Proof test interval	
Safe torque off (STO)	20 a (stepper motor/EC motor without diagnostics)
Hardware fault tolerance	1

Operating and environmental conditions

Degree of protection		IP20
Ambient temperature	[°C]	0 ... 50
Storage temperature	[°C]	−25 ... +55
Note on ambient temperature		Observe derating with regard to mounting clearance and output current
Relative humidity	[%]	5 ... 90 (non-condensing)
Protection class		III
Overvoltage category		I
Contamination level		2
Max. installation height	[m]	2000
Shock and vibration resistance		To EN 61800-2 and EN 61800-5-1
CE marking (see declaration of conformity)		To EU EMC Directive[1]
		To EU Machinery Directive
		To EU RoHS Directive
Note on materials		Contains paint-wetting impairment substances
		RoHS-compliant

[1] For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp ➜ Certificates.
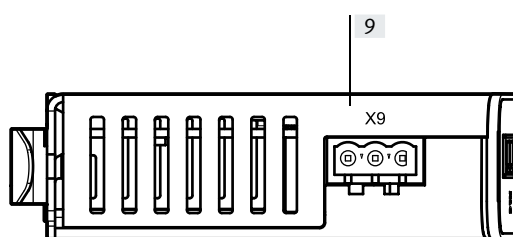   If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Data sheet

View
### Front

[1] Functional earth connection
[2] [X18] Standard Ethernet
[3] [X1A] I/O interface
[4] [X2] Encoder connection
[5] [X6] Motor connection
[6] [X1C] Connection for the reference switch or limit switch

Top

[7] [XF1 IN] RTE interface port 1
[8] [XF2 OUT] RTE interface port 2

Bottom

[9] [X9] Load and logic voltages

Required derating

Mounting clearances may be required at output currents > 4.6 A to ensure the device reaches at least its specified service life. The mounting clearances required depend on the ambient temperature t and the output current I.
Mounting clearances from 0 mm are possible when several servo drives CMMT-ST are combined. The following characteristic curves show the maximum permissible effective currents for the lateral mounting clearances 0 mm, 3 mm, 10 mm and 15 mm.
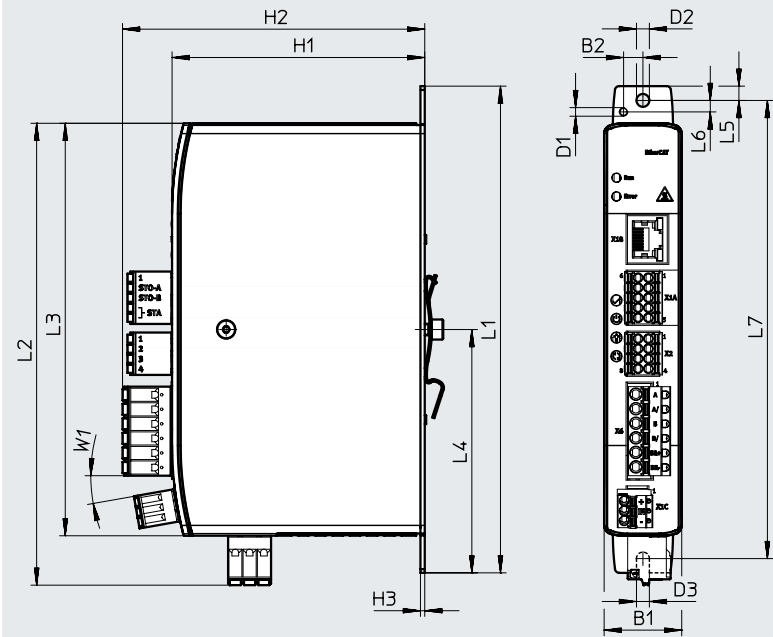
—————— Mounting clearance 0 mm
–·–·–·– Mounting clearance 3 mm
– – – – Mounting clearance 10 mm
············ Mounting clearance 15 mm
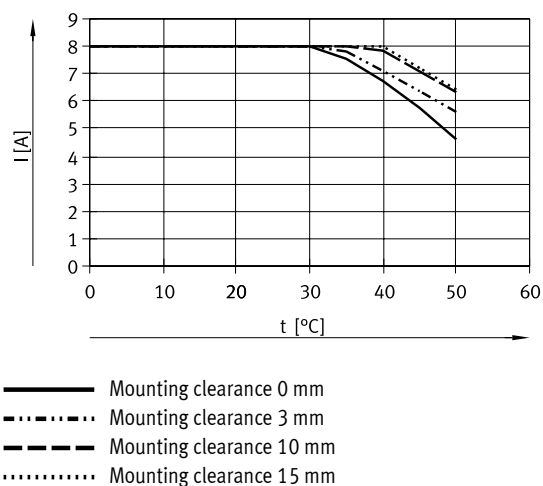
Data sheet

Dimensions   Download CAD data ➔ www.festo.com
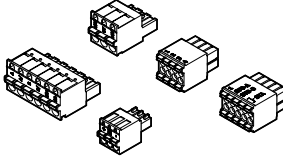
CMMT-ST-C8

Type	B1	B2	D1	D2	D3	H1	H2	H3
CMMT-ST-C8-1C	27	6.8	M3x0.5	4.5	4.5	88.3	105.6	1.5

Type	L1	L2	L3	L4	L5	L6	L7	W1
CMMT-ST-C8-1C	170	161.3	144	85	5	4	160	10

Ordering data

	Description	Number of phases	Nominal current	Part no.	Type
	The assortment of plugs NEKM (➔ page 11) is included in the scope of delivery of the servo drive	**Bus protocol: EtherCAT**			
		Single-phase	8	**8084005**	CMMT-ST-C8-1C-EC-SO
		Bus protocol: PROFINET RT/IRT			
		Single-phase	8	**8084004**	CMMT-ST-C8-1C-PN-SO
		Bus protocol: EtherNet/IP			
		Single-phase	8	**8084006**	CMMT-ST-C8-1C-EP-SO

Accessories

Ordering data – Accessories			
	Description	Part no.	Type
Assortment of plugs			
	• For single wiring connection with single-phase servo drives • Included in the scope of delivery of the servo drive	**8081885**	**NEKM-C-22**