Axis controller CPX-CMAX

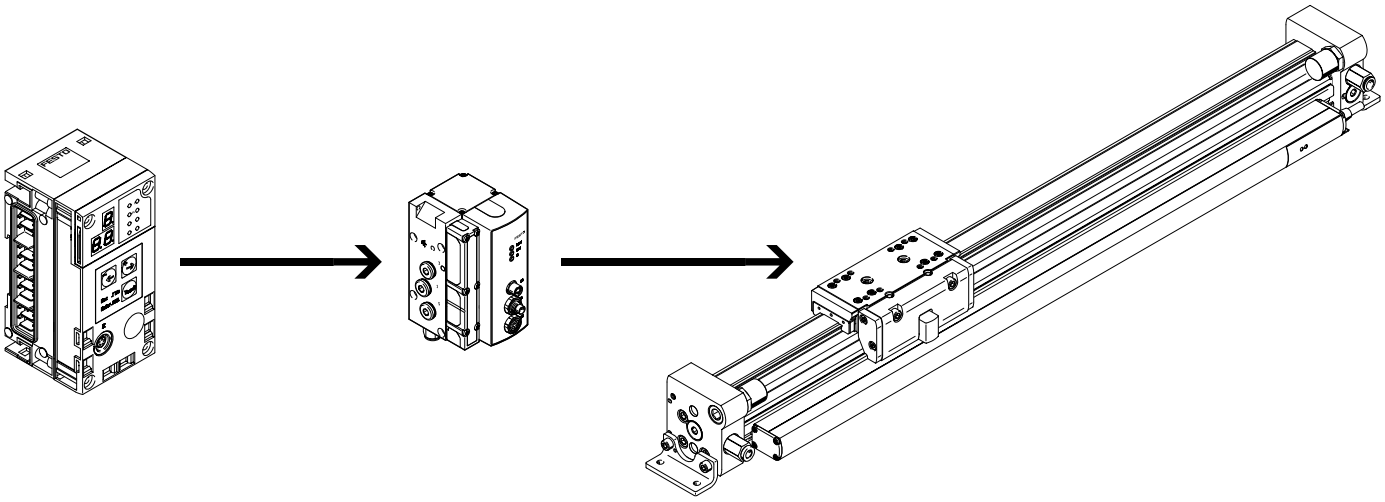
Overview

Servo-pneumatic drive technology

Positioning and Soft Stop applications as an integral component of the valve terminal CPX – the modular peripheral system for decentralised automation tasks.
The modular design means that valves, digital inputs and outputs, positioning modules and end-position controllers, as appropriate for the application, can be combined in almost any way on the CPX terminal.

Advantages:

- Pneumatics and electrics – control and positioning on one platform
- Innovative positioning technology – piston rod drives, rodless drives, rotary drives
- Actuation via fieldbus
- Remote maintenance, remote diagnostics, web server, SMS and e-mail alerts are all possible via TCP/IP
- Modules can be quickly exchanged and expanded without altering the wiring



Key features

Axis controller CPX-CMAX

Free choice:
Position and force control, directly actuated or selected from one of 128 configurable position sets.
If you are looking for something more:
The configurable record sequencing function enables simple functional sequences to be realised with the axis controller CPX-CMAX.
Everything is recognisable:
the auto-identification function identifies each participant with its device data on the controller CPX-CMAX.

Also included:
Actuation of a brake or clamping unit via the proportional directional control valve VPWP is also part of the scope of performance of the controller CPX-CMAX.
Up to 8 modules (max. 8 axes) can be operated in parallel and independently of each other.
Commissioning via FCT (Festo configuration software) or via fieldbus:
no programming, only configuration.

Advantages:
- Greater flexibility
- OEM friendly – commissioning also via fieldbus
- Easy to install and quick to commission
- Cost-effective
- You program the system in your PLC environment

End-position controllers CPX-CMPX

Datasheets ➔ Internet: cpx-cmpx

Fast travel between the mechanical end stops of the cylinder, stopping gently and without impact in the end position.
Fast commissioning via control panel, fieldbus or handheld unit.
Improved control of standstills.
Actuation of a brake or clamping unit via the proportional directional control valve VPWP is an integral part of the controller CMPX.

Depending on the fieldbus chosen, up to 9 end-position controllers can be actuated on the CPX terminal.
All system data can be read and written via the fieldbus, including, for example, the mid-positions.

Advantages:
- Greater flexibility
- OEM friendly – commissioning also via fieldbus
- Easy to install and quick to commission
- Cost-effective
  – Up to 30% faster cycle rates
  – Significantly reduced system vibration
- Improved working environment thanks to significantly reduced noise level
- The extended diagnostics help to reduce the service time of the machine

Proportional directional control valve VPWP

Datasheets ➔ Internet: vpwp

The 5/3-way proportional directional control valve for applications with Soft Stop and pneumatic positioning.
Fully digitalised – with integrated pressure sensors, with new diagnostic functions.
In sizes 4, 6, 8 and 10.
Flow rates of 350, 700, 1400 and 2000 l/min.

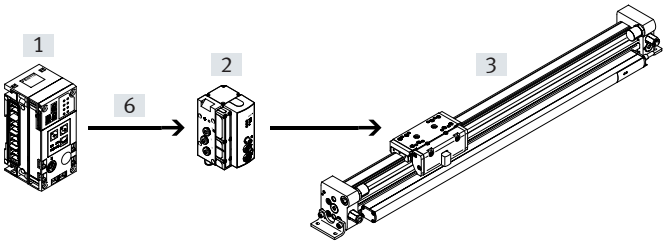
With switching output for controlling a brake.
Colour-coded supply ports.
Pre-assembled cables guarantee error-free and fast connection to the controllers CPX-CMPX and CPX-CMAX.

- Advantages:
- Easy to install and quick to commission
- Reduction of system downtimes thanks to the new diagnostic options
- With switching output for controlling a brake/clamping unit

Drive options

System with linear drive DDLI, DGCI

Datasheets → Internet: ddli or dgci



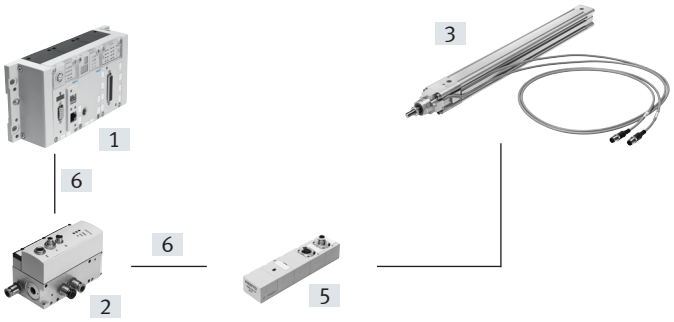
[1] Controller module CPX-CMPX or CPX-CMAX
[2] Proportional directional control valve VPWP
[3] Linear drive DDLI, DGCI with displacement encoder
[6] Connecting cable KVI-CP-3-...

- Pneumatic rodless linear drive with displacement encoder, with or without recirculating ball bearing guide
- Displacement encoder with absolute and contactless measurement
- Diameter:
  – With DGCI: 18 ... 63 mm
  – With DDLI: 25 ... 63 mm
- Stroke: 100 ... 2000 mm in fixed lengths
- Application areas: Soft Stop and pneumatic positioning
- Loads from 1 ... 180 kg
- No sensor interface required

Advantages:
- Complete drive unit
- DDLI for easy connection to customer's guide system
- Excellent running characteristics
- For fast and accurate positioning up to ±0.2 mm (only with axis controller CPX-CMAX)

System with standards-based cylinder DNCI, DDPC

Datasheets → Internet: dnci



[1] Controller module CPX-CMPX or CPX-CMAX
[2] Proportional directional control valve VPWP
[3] Standards-based cylinder DNCI, DDPC with displacement encoder
[5] Sensor interface CASM-S-D3-R7
[6] Connecting cable KVI-CP-3-...

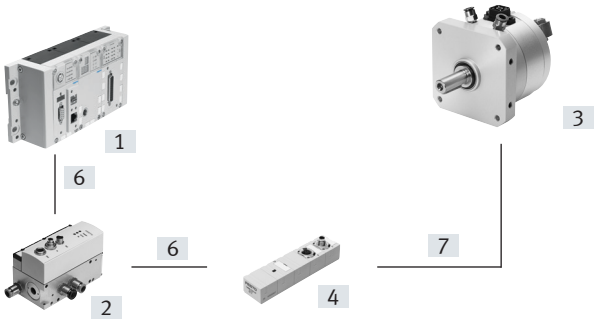
- Standards-based cylinder with integrated displacement encoder, conforms to DIN ISO 6432, VDMA 24 562, NF E 49 003.1 and Uni 10 290
- Displacement encoder with contactless and incremental measurement
- Diameter: 32 ... 100 mm
- Stroke: 100 ... 750 mm
- Application areas: Soft Stop and pneumatic positioning
- Loads from 3 ... 450 kg and the corresponding sensor interface CASM-S-D3-R7
- Pre-assembled cables guarantee error-free and fast electrical connection

Advantages:
- Compact drive unit
- Can be used universally
- Also with guide unit
- For fast and accurate positioning up to ±0.5 mm (only with axis controller CPX-CMAX)

Drive options

System with semi-rotary drive DSMI

Datasheets → Internet: dsmi



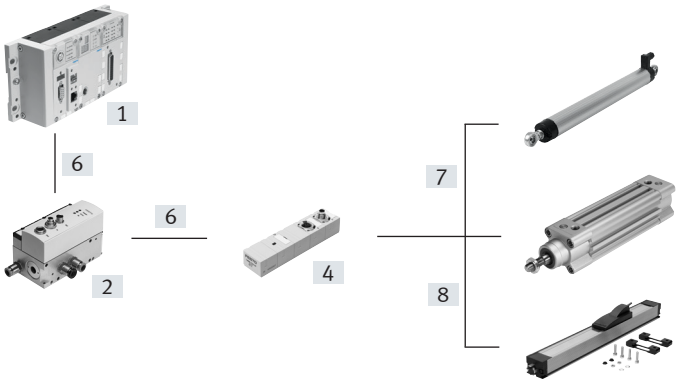
[1] Controller module CPX-CMPX or CPX-CMAX
[2] Proportional directional control valve VPWP
[3] Semi-rotary drive DSMI with displacement encoder
[4] Sensor interface CASM-S-D2-R3
[6] Connecting cable KVI-CP-3-...
[7] Connecting cable NEBC-P1W4-K-0.3-N-M12G5

- Swivel drive DSMI with integrated displacement encoder
- Identical design to pneumatic semi-rotary drive DSM
- Absolute displacement encoder based on a potentiometer
- Swivel range from 0 ... 270°
- Size: 25, 40, 63
- Max. torque: 5 ... 40 Nm
- Application areas: Soft Stop and pneumatic positioning
- Mass moments of inertia of 15 ... 6000 kgcm² and the corresponding sensor interface CASM-S-D2-R3
- Pre-assembled cables guarantee error-free and fast connection to the proportional directional control valve VPWP

Advantages:
- Complete drive unit, compact, can be used immediately
- High angular acceleration
- With adjustable fixed stops
- For fast and accurate positioning down to ±0.2° (only with axis controller CPX-CMAX)

System with potentiometer

Datasheets → Internet: casm



[1] Controller module CPX-CMPX or CPX-CMAX
[2] Proportional directional control valve VPWP
[4] Sensor interface CASM-S-D2-R3
[6] Connecting cable KVI-CP-3-...
[7] Connecting cable NEBC-P1W4-K-0.3-N-M12G5
[8] Connecting cable NEBC-A1W3-K-0.4-N-M12G5

- Attachable potentiometers with absolute measurement, with high degree of protection
- With connecting rod or moment compensator
- Measuring range: Connecting rod: 100 ... 750 mm Moment compensator: 225 ... 2000 mm
- Pre-assembled cables guarantee error-free and fast connection to the sensor interface CASM
- Application areas: Soft Stop and pneumatic positioning with cylinder diameters of 25 ... 80 mm
- Loads from 1 ... 300 kg

Advantages:
- Easy to install and quick to commission
- Cost-effective
- Can also be used in harsh operating conditions
- Numerous actuators: CPX-CMPX and CPX-CMAX also support cylinders with external displacement encoder

Drive options

System components for Soft Stop systems with end-position controller CPX-CMAX

[3]		Linear drive	Standards-based cylinder	Semi-rotary drive	Displacement encoder		→ Page/ Internet
		DDLI/DGCI	DNCI/DDPC	DSMI	MLO-LWG/-TLF	MME-MTS	
[1]	Axis controller CPX-CMAX	■	■	■	■	■	8
[2]	Proportional directional control valve VPWP	■	■	■	■	■	vpwp
[4]	Sensor interface CASM-S-D2-R3	–	–	■	■	–	casm
[5]	Sensor interface CASM-S-D3-R7	–	■	–	–	–	casm
[6]	Connecting cable KVI-CP-3-...	■	■	■	■	■	10
[7]	Connecting cable NEBC-P1W4-...	–	–	■	■ / –	–	nebc
[8]	Connecting cable NEBC-A1W3-...	–	–	–	– / ■	–	nebc
–	Connecting cable NEBP-M16W6-...	–	–	–	–	■	vpwp

Type codes and peripherals overview

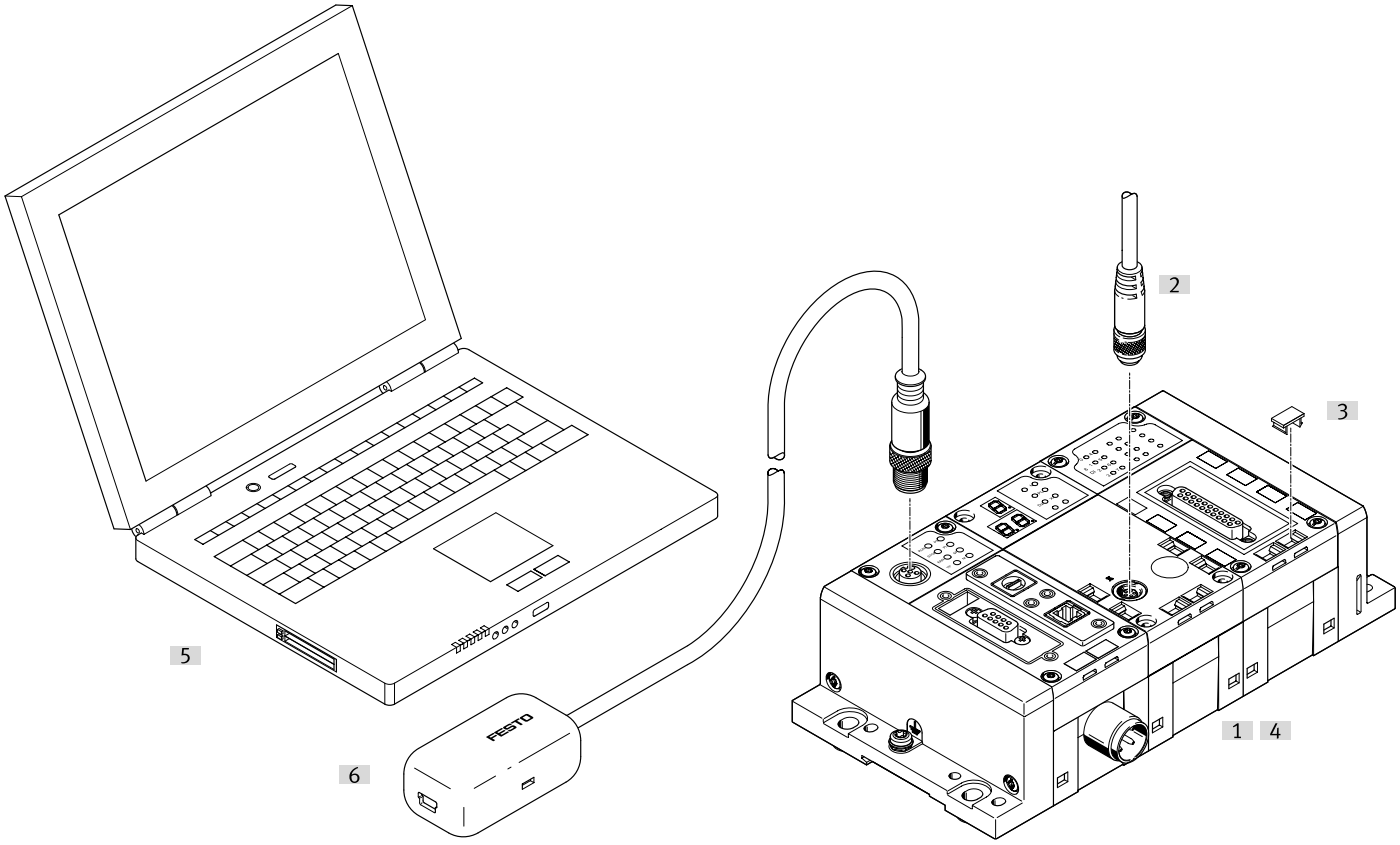
Type codes

001	Series	
CPX-CMAX	Axis controller for electrical terminal	

002	Function module	
C1	Controller	

003	Axes	
1	One	

Peripherals overview

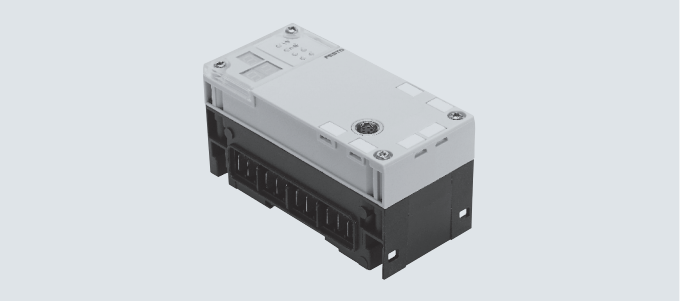


Accessories

	Type	Brief description	→ Page/Internet
[1]	Axis controller CPX-CMAX	Integrated into the CPX terminal. Screws for mounting on the polymer interlinking block are included in the scope of delivery	8
[2]	Connecting cable KVI-CP-3	For connecting axis controller CPX-CMAX and proportional directional control valve VPWP	10
[3]	Inscription labels IBS	For labelling the modules	10
[4]	Interlinking block CPX-GE	Connects the individual modules. Two versions are available: polymer or metal interlinking block.	11
[5]	Laptop	The CMAX can be configured and commissioned using the FCT software (Festo Configuration Tool)	–
[6]	Adapter NEFC	For connecting the interface on the CPX node to the PC. A standard USB cable with mini USB connector is also required	11
–	Screws CPX-M-M3	For mounting on the metal interlinking block	10

Datasheet

The axis controller CPX-CMAX is intended exclusively for use in valve terminals CPX.

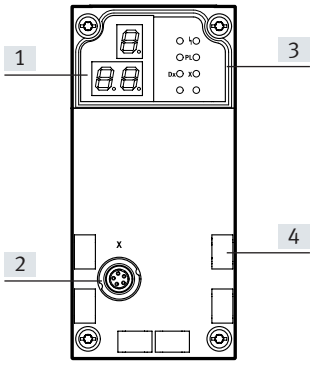


General technical data			
Operating voltage			
Operating voltage range		[V DC]	18 ... 30
Nominal operating voltage		[V DC]	24
Current consumption at nominal operating voltage		[mA]	200
Fuse protection (short circuit)			Electronic
Power failure buffering		[ms]	10
Load voltage			
Load voltage range		[V DC]	20 ... 30
Nominal load voltage		[V DC]	24
Permissible load current		[A]	2.5
Fuse protection (short circuit)			Electronic
No. of axis strings			1
Axes per string			1
Length of connecting cable to axis		[m]	≤ 30
Max. number of modules			7
Display			7-segment display
Assigned addresses	Outputs	[Bit]	8x8
	Inputs	[Bit]	8x8
Operating modes			Record mode
			Direct mode
Controller types			Position control
			Force control
Diagnostics			Module-orientated
			Via local 7-segment display
Status indicator			Module status
			Power load
			Display/Error Axis X
			MC Axis X
Control interface			
Data			CAN bus with Festo protocol
			Digital
Electrical connection			5-pin
			M9
			Socket
Materials: Housing			Reinforced PA
Note on materials			RoHS-compliant
LABS (PWIS) conformity			VDMA24364-B2-L
Product weight		[g]	240
Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

Datasheet

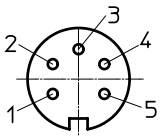
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Relative humidity	[%]	5 ... 95, non-condensing
Degree of protection to IEC 60529		IP65

Connection and display components



[1] 3-digit display
[2] Control interface
[3] Status LEDs
[4] Inscription labels

Pin allocation – Control interface



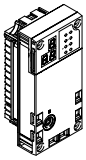
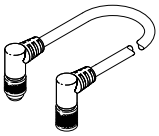
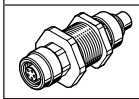
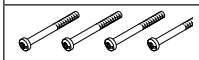
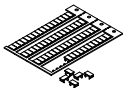
Pin	Signal	Designation
1	+24 V	Nominal operating voltage
2	+24 V	Load voltage
3	0 V	Ground
4	CAN_H	CAN High
5	CAN_L	CAN low
Housing	Shielding	Cable shield

Permitted bus nodes/CEC

Bus node/CEC	Protocol	Max. number of CMAX modules
CPX-CEC...	–	8
CPX-FB11	DeviceNet[1)]	8
CPX-FB13	PROFIBUS[2)]	8
CPX-FB14	CANopen	4
CPX-FB23-24	CC-LINK®	4 (as function module F23)
		8 (as function module F24)
CPX-FB36	EtherNet/IP	8
CPX-FB37	EtherCAT®	8
CPX-FB39	Sercos III	8
CPX-FB40	POWERLINK	8
CPX-FB43	PROFINET RT, M12	8
CPX-M-FB44	PROFINET RT, RJ45	8
CPX-M-FB45	PROFINET RT, SCRJ	8

1) As of revision 20 (R20)
2) As of revision 23 (R23)

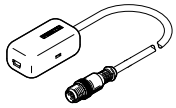
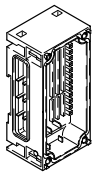
Accessories

Ordering data	Brief description		Part no.	Type
Axis controller				
	Order code in the CPX configurator: T21		**548932**	**CPX-CMAX-C1-1**
Connecting cable				
	Connecting cable with angled plug and angled socket	0.25 m	**540327**	**KVI-CP-3-WS-WD-0.25**
		0.5 m	**540328**	**KVI-CP-3-WS-WD-0.5**
		2 m	**540329**	**KVI-CP-3-WS-WD-2**
		5 m	**540330**	**KVI-CP-3-WS-WD-5**
		8 m	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable with straight plug and straight socket	2 m	**540332**	**KVI-CP-3-GS-GD-2**
		5 m	**540333**	**KVI-CP-3-GS-GD-5**
		8 m	**540334**	**KVI-CP-3-GS-GD-8**
	Connecting component for cabinet through-feed		**543252**	**KVI-CP-3-SSD**
Screws				
	For mounting on the metal interlinking block		**550219**	**CPX-M-M3X22-4X**
Inscription labels				
	Inscription labels 6x10, in frames	64 pieces	**18576**	**IBS-6X10**
User documentation				
	Manual – Axis controller CPX-CMAX[1)]	German	**559750**	**P.BE-CPX-CMAX-SYS-DE**
		English	**559751**	**P.BE-CPX-CMAX-SYS-EN**
		Spanish	**559752**	**P.BE-CPX-CMAX-SYS-ES**
		French	**559753**	**P.BE-CPX-CMAX-SYS-FR**
		Italian	**559754**	**P.BE-CPX-CMAX-SYS-IT**

1) User documentation in paper form is not included in the scope of delivery

Accessories

Ordering data

	Brief description		Part no.	Type
Adapter				
	Adapter M12, 5-pin to mini-USB socket and control software		**547432**	**NEFC-M12G5-0.3-U1G5**
Polymer interlinking block as extension block				
	Without power supply	–	**195742**	**CPX-GE-EV**
	With additional supply for outputs	M18 – 4-pin	**195744**	**CPX-GE-EV-Z**
		7/8" – 5-pin	**541248**	**CPX-GE-EV-Z-7/8-5POL**
		7/8" – 4-pin	**541250**	**CPX-GE-EV-Z-7/8-4POL**
	With additional supply for valves	M18 – 4-pin	**533577**	**CPX-GE-EV-V**
Tie rods				
	For expansion using an interlinking block	Single	**525418**	**CPX-ZA-1-E**