Axis controllers CPX-CMAX

FESTO

Axis controllers CPX-CMAX

Overview

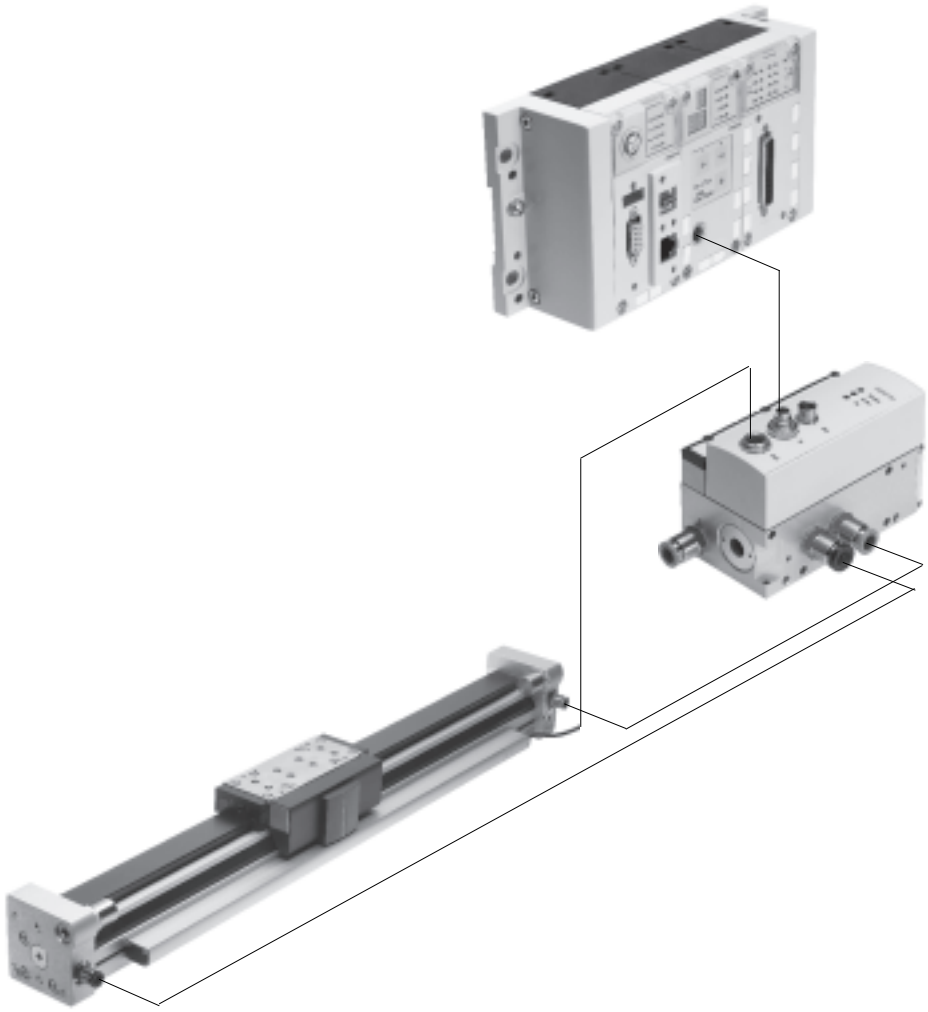
Servo-pneumatic drive technology

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 to 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 alert are all possible via TCP/IP
- Modules can be quickly exchanged and expanded without altering the wiring



Axis controllers CPX-CMAX

Key features

Axis controllers CPX-CMAX

Technical data ➔ 7

Free choice:
Position and force control, directly actuated or selected from one of 64 configurable position sets.
If you are looking for something more:
the configurable function for switching to the next set enables simple functional sequences to be realised in the axis controller CPX-CMAX.
Everything is recognisable:
the auto-identification function identifies each station with its device data on the controller CPX-CMAX.

Also included:
The functional scope of the controller CPX-CMAX includes actuation of a brake or clamping unit via the proportional directional control valve VPWP.
Up to 7 modules (max. 7 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
- Clear installation and fast commissioning
- Cost-effective
- You program the system in your PLC environment

End-position controllers CPX-CMPX

Technical data ➔ 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 downtime.
Actuation of a brake or clamping unit via the proportional directional control valve VPWP is an integral component 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
- Clear installation and fast commissioning
- Cost-effective
  - Up to 30% faster cycle rates
  - Significantly reduced system vibration
- Improved work ergonomics thanks to significantly reduced noise level
- The extended diagnostics help to reduce the service time of the machine

Proportional directional control valve VPWP

Technical data ➔ 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 and 8.
Flow rate of 350, 700 and 1,400 l/min.

With switching output for actuating a brake.
Coloured supply ports.
Pre-assembled cables guarantee faultless and fast connection with the controllers CPX-CMPX and CPX-CMAX.

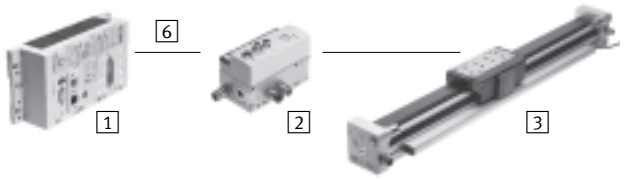
Advantages:
- Clear installation and fast commissioning
- Reduction of system downtimes thanks to the new diagnostic options
- With switching output for actuating a brake/clamping unit

Axis controllers CPX-CMAX

Drive options

System with linear drive DGCI

Technical data ➔ Internet: dgci



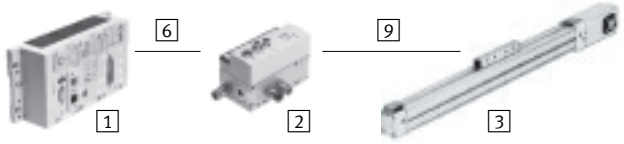
1 Controller module CPX-CMPX or CPX-CMAX
2 Proportional directional control valve VPWP
3 Linear drive DGCI with displacement encoder
6 Connecting cable KVI-CP-3-...

- Pneumatic rodless linear drive with displacement encoder and recirculating ball bearing guide
- Displacement encoder with absolute and contactless measuring
- Identical construction as pneumatic linear drive DGC
- Diameter: 18 ... 40 and 63 mm
- Stroke: 100 ... 2,000 mm in fixed lengths
- Range of application of Soft Stop and pneumatic positioning of loads from 1 ... 180 kg
- No sensor interface required

Advantages:
- Finished drive unit, precision guide
- Excellent running characteristics
- For fast and accurate positioning down to ±0.2 mm (only with axis controller CPX-CMAX)

System with linear drive DGPI, DGPIL or displacement encoder MME-MTS

Technical data ➔ Internet: dgpi



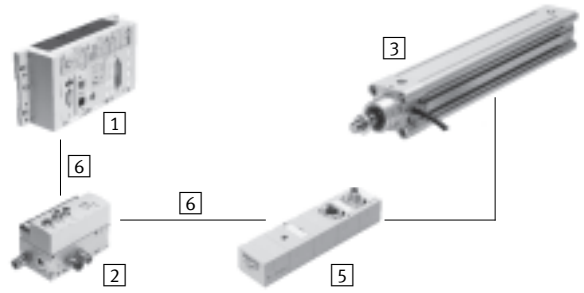
1 Controller module CPX-CMPX or CPX-CMAX
2 Proportional directional control valve VPWP
3 Linear drive DGPI, DGPIL with displacement encoder
6 Connecting cable KVI-CP-3-...
9 NEBP-M16W6-K-2-M9W5

- Pneumatic rodless linear drive with displacement encoder, with or without recirculating ball bearing guide
- Displacement encoder with absolute and contactless measuring
- Diameter: 25 ... 63 mm
- Stroke: 225 ... 2,000 mm in fixed lengths
- Range of application of Soft Stop and pneumatic positioning of loads from 2 ... 180 kg
- No sensor interface required

Advantages:
- Finished drive unit
- Excellent running characteristics
- For fast and accurate positioning down to ±0.2 mm (only with axis controller CPX-CMAX)

System with standard cylinder DNCI

Technical data ➔ Internet: dnci



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

- Standard 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 measuring
- Diameter: ∅ 32 ... 63 mm
- Stroke: 100 ... 750 mm
- Range of application of Soft Stop and pneumatic positioning: loads from 3 ... 180 kg and the matching sensor interface CASM-S-D3-R7
- Pre-assembled cables guarantee faultless and fast electrical connection

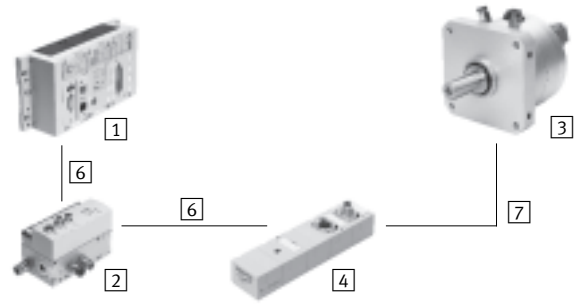
Advantages:
- Compact drive unit
- Universal applications
- Also with guide unit
- For fast and accurate positioning down to ±0.3 mm (only with axis controller CPX-CMAX)

Axis controllers CPX-CMAX

Drive options

System with swivel module DSMI

Technical data ➔ Internet: dsmi



1 Controller module CPX-CMPX or CPX-CMAX
2 Proportional directional control valve VPWP
3 Swivel module 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

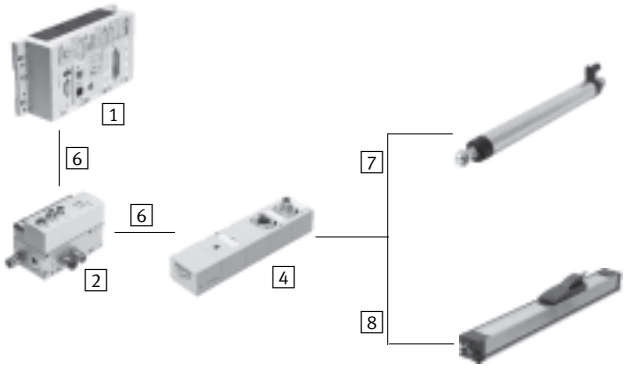
- Swivel module DSMI with integrated displacement encoder
- Identical construction as pneumatic swivel module DSM
- Absolute displacement encoder on basis of potentiometer
- Swivel range from 0 ... 270°
- Size: 25, 40, 63
- Max. torque: 5 ... 40 Nm
- Range of application of Soft Stop and pneumatic positioning: mass moments of inertia from 15 ... 6,000 kgcm^2 and the matching sensor interface CASM-S-D2-R3
- Pre-assembled cables guarantee faultless and fast connection with 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

Technical data ➔ 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: 100 ... 2,000 mm
- Pre-assembled cables guarantee faultless and fast connection with the sensor interface CASM
- Range of application of Soft Stop and pneumatic positioning with cylinder ∅ 18 ... 80 mm, loads from 1 ... 300 kg

Advantages:

- Clear installation and fast commissioning
- Cost-effective
- Can also be used in harsh environmental conditions
- Variety in the drives: CPX-CMPX and CPX-CMAX also support cylinders with external displacement encoder

Axis controllers CPX-CMAX

Drive options

System components for pneumatic positioning systems with axis controller CPX-CMAX									
3		Linear drive		Standard cylinder	Swivel module	Displacement encoder	Potentiometer		➔ Page/ Internet
		DGCI	DGPI, DGPIL	DNCI	DSMI	MME	LWG	TLF	
1	Axis controller CPX-CMAX	■	■	■	■	■	■	■	7
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
9	Connecting cable NEBP-M16W6-...	–	■	–	–	■	–	–	nebp

Axis controllers CPX-CMAX

Type codes and peripherals overview

Type codes

CPX – CMAX – C1 – 1

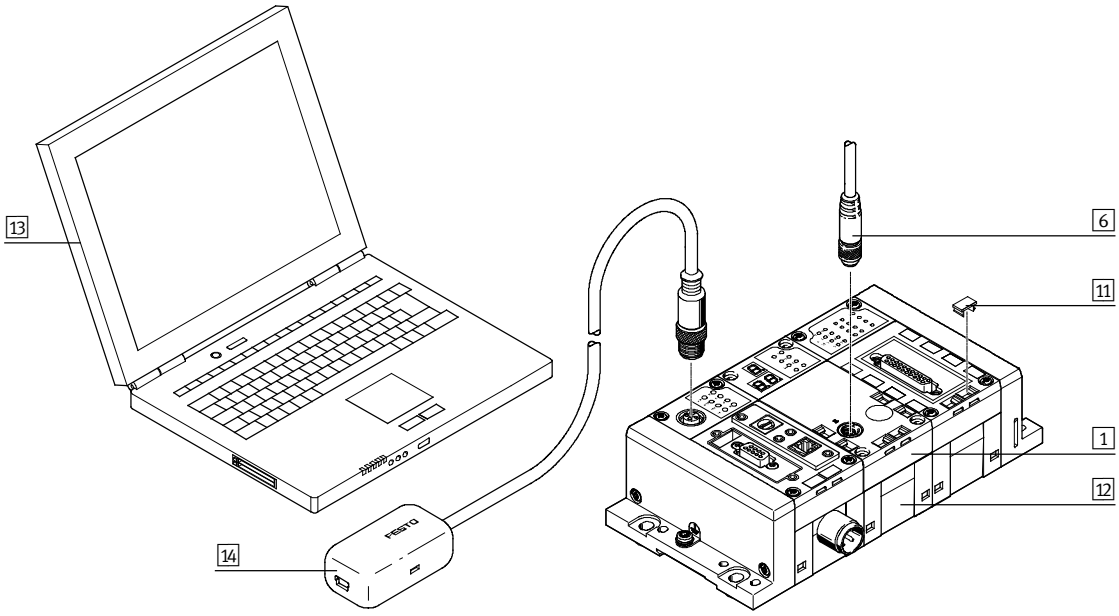
Valve terminal	
CPX	Terminal

Type	
CMAX	Axis controller

Function module	
C1	Controller

Axes	
1	One axis

Peripherals overview



Accessories

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

Axis controllers CPX-CMAX

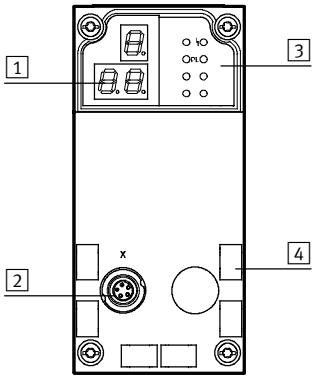
Technical data

The axis controller CPX-CMAX is intended exclusively for 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 bridging		[ms]	10
Load voltage			
Load voltage range		[V DC]	20 ... 30
Nominal load voltage		[V DC]	24
Perm. load current		[A]	2.5
Fuse protection (short circuit)			Electronic
Number of axis strings			1
Axes per string			1
Length of connecting cable to axis		[m]	≤ 30
Max. no. of modules			7
Display			7-segment display
Assigned addresses	Outputs	[bit]	8x8
	Inputs	[bit]	8x8
Operating modes			Record Select mode
			Direct mode
Controller types			Position control
			Force control
Diagnostics			Module-orientated
			Via local 7-segment display
Status display			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 polyamide
Note on materials			RoHS-compliant
Product weight		[g]	140
Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

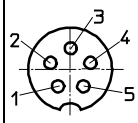
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Relative air humidity	[%]	5 ... 95, non-condensing
Protection class to IEC 60529		IP65

Connection and display components



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

Pin allocation – plug 2



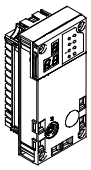
Pin	Signal	Designation
1	+24 V	Nominal operating voltage
2	+24 V	Load voltage
3	0 V	Ground
4	CAN_H	CAN high
5	CAN_L	CAN low
Housing	Screened	Cable screening

Permitted bus nodes/FEC

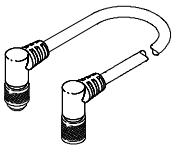
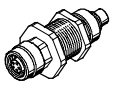
Bus node/FEC	Protocol	Max. no. of CMAX modules
CPX-FEC	–	8
CPX-CEC	–	8
CPX-CEC-C1	–	8
CPX-CEC-M1	–	8
CPX-FB6	INTERBUS	1
CPX-FB11	DeviceNet[1)]	8
CPX-FB13	PROFIBUS-DP[2)]	8
CPX-FB14	CANopen	4
CPX-M-FB20	INTERBUS	1
CPX-M-FB21	INTERBUS	1
CPX-FB23-24	CC-Link	4 (function module F23)
		8 (function module F24)
CPX-FB32	EtherNet/IP	8
CPX-FB33	PROFINET, M12	8
CPX-M-FB34	PROFINET, RJ45	8
CPX-M-FB35	PROFINET, SCRJ	8
CPX-FB36	EtherNet/IP	8
CPX-FB38	EtherCAT	8

1) With Revision 20 (R20)
2) With Revision 23 (R23)

Ordering data – Axis controllers

	Brief description	Part No.	Type
	Order code in the CPX configurator: T21	**548932**	**CPX-CMAX-C1-1**

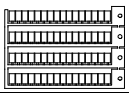
Ordering data – Connecting cables

	Brief description	Cable length [m]	Part No.	Type
	Connecting cable with angled plug and angled socket	0.25	**540327**	**KVI-CP-3-WS-WD-0,25**
		0.5	**540328**	**KVI-CP-3-WS-WD-0,5**
		2	**540329**	**KVI-CP-3-WS-WD-2**
		5	**540330**	**KVI-CP-3-WS-WD-5**
		8	**540331**	**KVI-CP-3-WS-WD-8**
	Connecting cable with straight plug and straight socket	2	**540332**	**KVI-CP-3-GS-GD-2**
		5	**540333**	**KVI-CP-3-GS-GD-5**
		8	**540334**	**KVI-CP-3-GS-GD-8**
	Connector for control cabinet through-feed	–	**543252**	**KVI-CP-3-SSD**

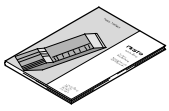
Ordering data – Screws

	Brief description	Part No.	Type
	For mounting on the metal interlinking block	**550219**	**CPX-M-M3X22-4X**

Ordering data – Inscription labels

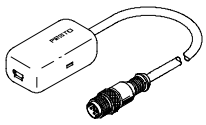
	Brief description	Number	Part No.	Type
	Inscription labels 6x10, in frames	64	**18576**	**IBS-6X10**

Documentation[1)]

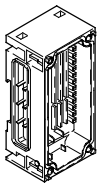
	Language	Part No.	Type
	DE	**559750**	**P.BE-CPX-CMAX-SYS-DE**
	EN	**559751**	**P.BE-CPX-CMAX-SYS-EN**
	ES	**559752**	**P.BE-CPX-CMAX-SYS-ES**
	FR	**559753**	**P.BE-CPX-CMAX-SYS-FR**
	IT	**559754**	**P.BE-CPX-CMAX-SYS-IT**
	SV	**559755**	**P.BE-CPX-CMAX-SYS-SV**

1) Manual in paper form is not included in the scope of delivery.

Ordering data – Adapters

	Brief description	Part No.	Type
	Adapter cable from 5-pin M12 to mini USB socket and controller software	**547432**	**NEFC-M12G5-0.3-U1G5**

Ordering data – Interlinking block, plastic, as expansion block

	Brief description	Connection	Part No.	Type
	Without power supply	–	**195742**	**CPX-GE-EV**
	With additional power supply for outputs	M18	**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 power supply for valves	M18	**533577**	**CPX-GE-EV-V**
		7/8" – 4-pin	**541252**	**CPX-GE-EV-V-7/8-4POL**

Ordering data – Tie rods

	Brief description	Extension	Part No.	Type
	For extension using an interlinking block	1-fold	**525418**	**CPX-ZA-1-E**