Measuring modules CPX-CMIX

FESTO

Measuring modules CPX-CMIX

Key features

At a glance

Movement and measurement in one, 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, end-position controllers and measuring modules, as appropriate to the application, can be combined in almost any way on the CPX terminal.

Advantages:

- Pneumatics and electrics – movement and measurement on one platform
- Innovative measurement 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

Retracting/advancing and measuring in one work step

Fully digital data acquisition and transmission means pneumatic cylinders can now be used as sensors. With very high repetition accuracy and incorporating both analogue and digital measuring sensors.

Time and space-saving

Electrical peripherals enable the highly efficient measuring module to be seamlessly and compactly integrated into existing control environments. The new component is tailored to the proven CPX system and can be commissioned quickly and easily.

Process reliability

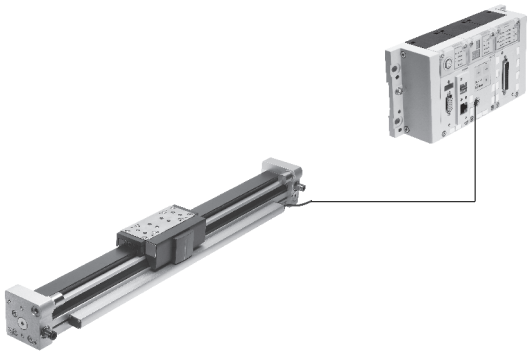
All process steps are measured and documented, which significantly improves quality. The adjustable contact force (via pressure regulator) also increases the precision of the “displacement sensor”.

Reduced system costs

As with all modules in the electrical terminal CPX, easy functional integration in fieldbus/Ethernet networks is a matter of course.

Drives to use

Linear drives DGCI



- The measurement signal of the linear drive DGCI supplies a CAN signal, which is read in directly into the CPX-CMIX module
- The measuring system measures absolute values, in other words the actual position is immediately available for the controller after the system is switched on

Technical data

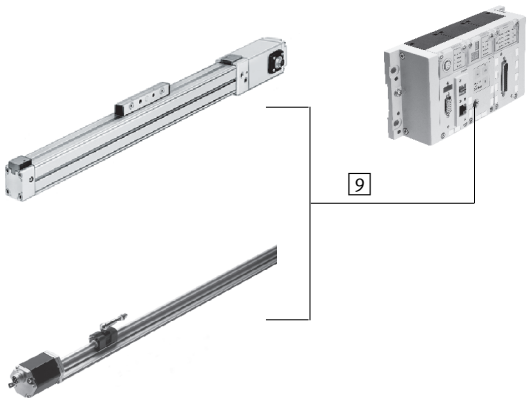
Linearity	[%]	≤ ±0.01 full scale (nominal length)
Repetition accuracy	[mm]	< ±0.01
Hysteresis	[µm]	< 4
Shortest measurable speed	[mm/s]	10

Measuring modules CPX-CMIX

Key features

Drives to use

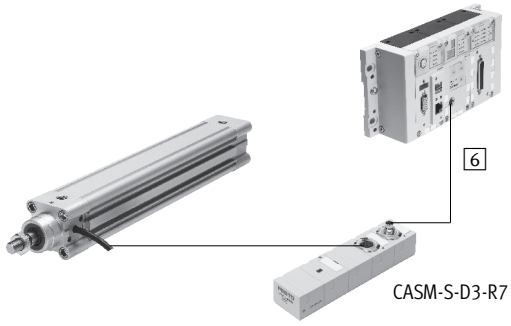
Linear drives DGPI, DGPIL or displacement encode MME



- The measurement signal of the linear drive DGPI, DGPIL or displacement decoder MME supplies a CAN signal, which is read in directly into the CPX-CMIX module
- The measuring system measures absolute values, in other words the actual position is immediately available for the controller after the system is switched on

Technical data		
Linearity	[%]	≤ ±0.02 full scale (nominal length)
Repetition accuracy	[mm]	< ±0.01
Hysteresis	[µm]	< 4
Shortest measurable speed	[mm/s]	10

Linear drives DNCI



- The measuring signal of the linear drive DNCI is an incremental signal, which is converted to a CAN signal in the sensor interface CASM-S-D3-R7. The converted signal is then read into the CPX-CMIX
- The measuring system does not measure absolute values, so must be homed after it is switched on. The actual position is available for the controller once this has been done

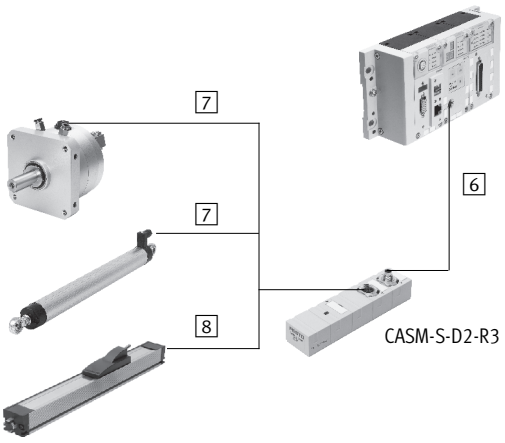
Technical data		
Linearity	[mm]	≤ ±0.07
Repetition accuracy	[mm]	< ±0.02
Hysteresis	[µm]	< 0.03
Shortest measurable speed	[mm/s]	10

Measuring modules CPX-CMIX

Key features

Drives to use

Swivel modules DSMI, standard cylinders DNCM or potentiometers MLO-POT



- The measuring systems supply an analogue measuring signal, which is converted to a CAN signal in the sensor interface CASM-S-D2-R3. The converted signal is then read into the CPX-CMIX
- Potentiometers measure absolute values, in other words the actual position is immediately available for the controller after the potentiometer is switched on

Other potentiometers can be used, in which case the following must be noted:

- The connection resistance of the potentiometer must be 3 ... 20 kΩ
- Poorer potentiometer values for linearity and temperature coefficient will decrease the accuracy of the measured value
- A special cable must be used for connection to the sensor interface

Technical data

Measuring length	[mm]	100	150	225	300	360	450	500
Linearity	[% of stroke]	±0.1	±0.09	±0.08	±0.07	±0.06	±0.05	±0.05
Repetition accuracy	[mm]	±0.01	±0.01	±0.01	±0.01	±0.011	±0.014	±0.016
Shortest measurable speed	[mm/s]	3	5	7	9	11	14	15
Temperature coefficient	[ppm/°C]	5						

Measuring length	[mm]	600	750	1,000	1,250	1,500	1,750	2,000
Linearity	[% of stroke]	±0.05	±0.04	±0.04	±0.03	±0.03	±0.03	±0.02
Repetition accuracy	[mm]	±0.019	±0.023	±0.03	±0.038	±0.046	±0.054	±0.062
Shortest measurable speed	[mm/s]	18	23	31	38	46	53	61
Temperature coefficient	[ppm/°C]	5						

Measuring modules CPX-CMIX

Type codes and peripherals overview

Type codes

CPX – CMIX – M1 – 1

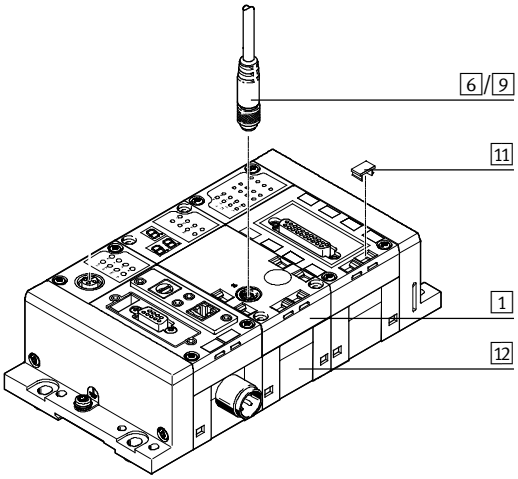
Valve terminal	
CPX	Terminal

Type	
CMIX	Measuring module

Function module	
M1	Measuring unit

Axes	
1	One axis

Peripherals overview



Accessories

	Type	Brief description	➔ Page/Internet
1	Measuring module CPX-CMIX	Integrated in the CPX terminal. Screws for mounting on the plastic interlinking block are included in the scope of delivery	6
6	Connecting cable KVI-CP-3	For connecting the measuring module CPX-CMIX and sensor interface CASM	8
11	Inscription label IBS	For labelling the modules	8
12	Interlinking block CPX-GE	Connects the individual modules. Two versions are available: plastic or metal interlinking block	9
–	Screws CPX-M-M3	For mounting on the metal interlinking block	8
7	Connecting cable NEBC-P1W4-...	For connecting the sensor interface CASM and swivel module DSMI or potentiometer LWG	nebc
8	Connecting cable NEBC-A1W3-...	For connecting the sensor interface CASM and potentiometer TLF	nebc
9	Connecting cable NEBP-M16W6-...	For connecting measuring module CPX-CMIX and linear drive DGPI, DGPIL or displacement encoder MME	8

Measuring modules CPX-CMIX

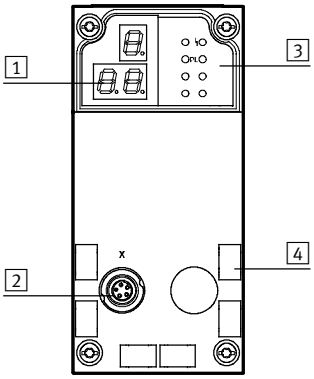
Technical data

The measuring module CPX-CMIX 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]	80
Protection against short circuit			Yes
Power failure bridging		[ms]	10
No. of axis strings			1
Axes per string			1
Length of connecting cable to axis		[m]	≤ 30
Max. no. of modules			9
Display			7-segment display
Assigned addresses	Outputs	[bit]	6x8
	Inputs	[bit]	6x8
Diagnostics			Channel and module-oriented
			Via local 7-segment display
			Undervoltage of modules
			Undervoltage of measuring system
Status display			Power Load
			Error
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

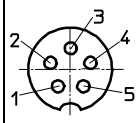
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Relative air humidity	[%]	5 ... 95, non-condensing
Protection class to IEC 60529		IP65

Connection and display components



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

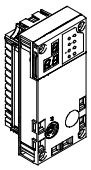
Pin allocation – Plug 2

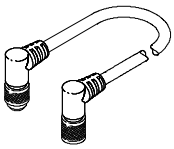
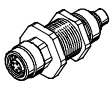
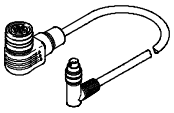


Pin	Signal	Designation
1	+24 V	Nominal operating voltage
2	+24 V	Load voltage
3	0 V	Ground
4	CAN_H	CAN high
5	CAN_L	CAN low
Housing	Screened	Cable screening

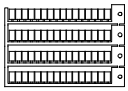
Permitted bus nodes/FEC

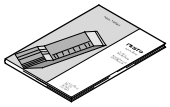
Bus node/FEC	Protocol	Max. no. of CMIX modules	Remarks
CPX-FEC	–	9	On request
CPX-FB6	Interbus	2	On request
CPX-FB11	DeviceNet	9	Revision 20 (R20) and above
CPX-FB13	Profibus DP	9	Revision 23 (R23) and above
CPX-FB14	CANopen	3	On request
CPX-FB23	CC-Link	9	On request
CPX-FB32	Ethernet/IP	9	On request
CPX-FB33	Profinet, M12	9	On request
CPX-M-FB34	Profinet, RJ45	9	On request
CPX-FB38	EtherCat	9	On request

Ordering data – Measuring module			
	Brief description	Part No.	Type
	Order code in the CPX configurator: T23	**567417**	**CPX-CMIX-M1-1**

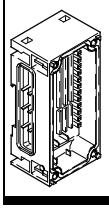
Ordering data – Connecting cables				
	Brief description	Cable length [m]	Part No.	Type
	Connecting cable with angled plug and angled socket	0.25	**540327**	**KVI-CP-3-WS-WD-0,25**
		0.5	**540328**	**KVI-CP-3-WS-WD-0,5**
		2	**540329**	**KVI-CP-3-WS-WD-2**
		5	**540330**	**KVI-CP-3-WS-WD-5**
		8	**540331**	**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**
Connection between linear drive DGPI, DGPIL or displacement encoder MME and measuring module CPX-CMIX				
	For linear drive DGPI, DGPIL	2	**575898**	**NEBP-M16W6-K-2-M9W5**

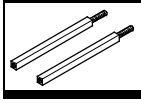
Ordering data – Screws			
	Brief description	Part No.	Type
	For mounting on the metal interlinking block	**550219**	**CPX-M-M3X22-4X**

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	**567053**	**P.BE-CPX-CMIX-DE**
	EN	**567054**	**P.BE-CPX-CMIX-EN**
	ES	**567055**	**P.BE-CPX-CMIX-ES**
	FR	**567056**	**P.BE-CPX-CMIX-FR**
	IT	**567057**	**P.BE-CPX-CMIX-IT**
	SV	**567058**	**P.BE-CPX-CMIX-SV**

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

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 rod				
	Brief description	Expansion	Part No.	Type
	For expansion using an interlinking block	1-fold	**525418**	**CPX-ZA-1-E**