

Measuring modules CPX-CMIX

FESTO



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 terminal CPX.

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 a tried-and-tested system and is quick and easy to commission.

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

Process reliability

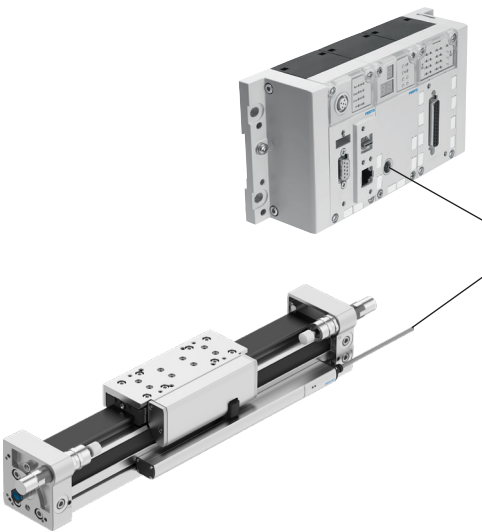
All process steps are measured and documented, which significantly improves quality. The adjustable contact force (via pressure regulator) also increases the precision of the "displacement sensor".

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 that can be used

Linear drives DGCI



- The measuring signal of the linear drive DGCI supplies a CAN signal. This signal is read 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

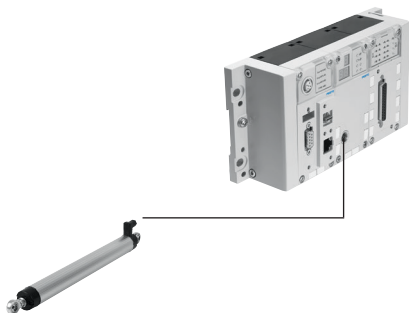
Technical data		
Linearity error ¹⁾	[%]	< ±0.02, min. ±50 µm
Resolution	[mm]	0.01
Repetition accuracy ²⁾	[mm]	±0.01/±0.02
Hysteresis	[µm]	< 4
Max. temperature coefficient	[ppm/°K]	15
Lowest measurable speed	[mm/s]	10

1) Always refers to max. stroke.
2) Stroke ≤ 1000 mm/stroke > 1000 mm

Key features

Drives that can be used

Displacement encoder MME



- The measuring signal of the displacement encoder MME supplies a CAN signal. This signal is read 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

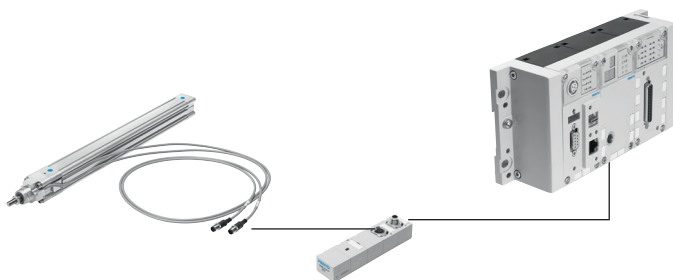
Technical data

Linearity error ¹⁾	[%]	< ±0.01, min. ±40 µm
Resolution	[mm]	0.01
Repetition accuracy ²⁾	[mm]	±0.01/±0.02
Hysteresis	[µm]	< 4
Max. temperature coefficient	[ppm/°K]	15
Lowest measurable speed	[mm/s]	10

1) Always refers to max. stroke.

2) Stroke ≤ 1000 mm/stroke > 1000 mm

Linear drives DNCI



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

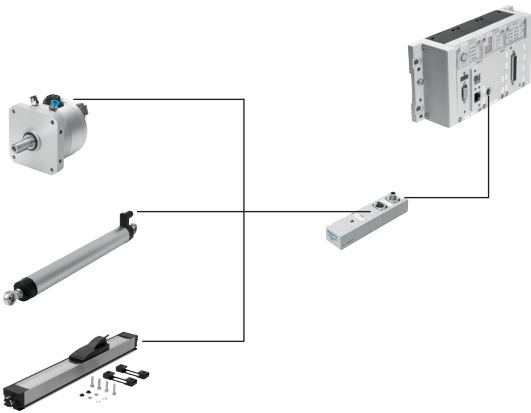
Technical data

Linearity error		
Strokes up to 500 mm	[mm]	< ±0.08
Strokes up to 1000 mm	[mm]	< ±0.09
Strokes over 1000 mm	[mm]	< ±0.11
Resolution	[mm]	0.01
Repetition accuracy	[mm]	< ±0.02
Hysteresis	[mm]	< 0.03
Lowest measurable speed	[mm/s]	10

Key features

Drives that can be used

Swivel modules DSMI or potentiometers MLO-POT



- The measuring systems supply an analogue measuring signal. This signal is converted to a CAN signal in the sensor interface CASM-S-D2-R3. The converted signal is then read into the CPX-CMIX module.
 - 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 error								
MLO-POT	[%]	±0.1	±0.08	±0.07	±0.06	±0.05	±0.05	±0.05
DSMI ¹⁾	[%]	< ±0.25						
Resolution								
MLO-POT	[mm]	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01	±0.01
DSMI	[°]	< ±0.1						
Repetition accuracy								
MLO-POT	[mm]	±0.01	±0.01	±0.01	±0.01	±0.02	±0.02	±0.02
DSMI	[°]	< ±0.1						
Lowest measurable speed	[mm/s]	3	5	7	9	11	14	15
Temperature coefficient	[ppm/°K]	5						

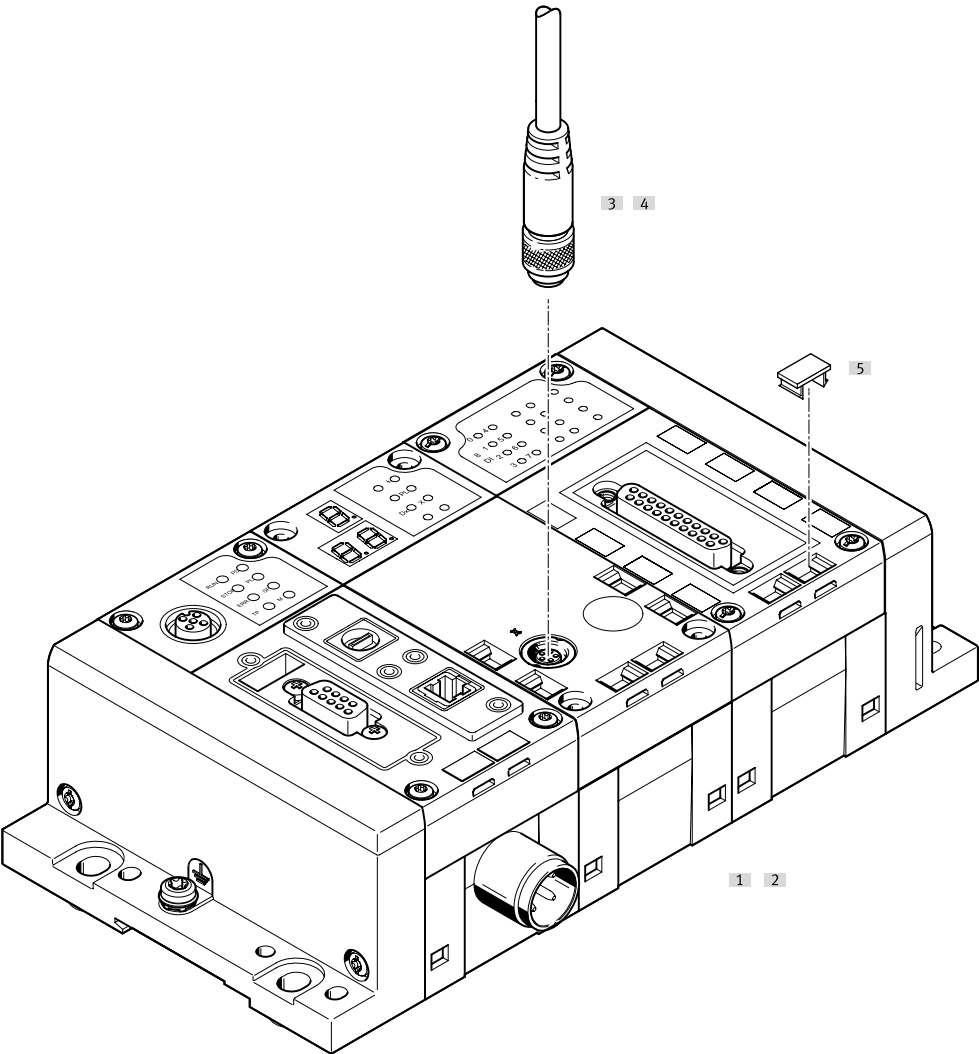
Measuring length	[mm]	600	750	1000	1250	1500	1750	2000
Linearity error								
MLO-POT	[%]	±0.05	±0.04	±0.04	±0.03	±0.03	±0.03	±0.02
DSMI ¹⁾	[%]	< ±0.25						
Resolution								
MLO-POT	[mm]	±0.01	±0.02	±0.02	±0.02	±0.03	±0.03	±0.03
DSMI	[°]	< ±0.1						
Repetition accuracy								
MLO-POT	[mm]	±0.02	±0.03	±0.03	±0.04	±0.05	±0.06	±0.07
DSMI	[°]	< ±0.1						
Lowest measurable speed	[mm/s]	18	23	31	38	46	53	61
Temperature coefficient	[ppm/°K]	5						

1) In relation to max. swivel angle

Type codes and peripherals overview

Type codes			
001	Series	003	Axes
CPX-CMIX	Measuring module for electrical terminal	1	One
002	Function module		
M1	Measuring unit		

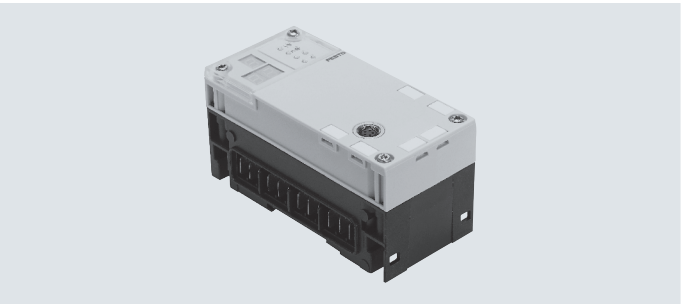
Peripherals overview



Accessories				
Type		Description		→ Page/Internet
[1]	Measuring module	CPX-CMIX	Integrated into the CPX terminal. Screws for mounting on the polymer interlinking block are included in the scope of delivery	6
[3]	Connecting cable	KVI-CP-3	For connecting the measuring module CPX-CMIX and sensor interface CASM	8
[5]	Inscription labels	IBS	For labelling the modules	8
[2]	Interlinking block	CPX-GE	Connects the individual modules. Two versions are available: polymer or metal interlinking block.	9
–	Screws	CPX-M-M3	For mounting on the metal interlinking block	8
–	Connecting cable	NEBC-P1W4	For connecting the sensor interface CASM and swivel module DSMI or potentiometer LWG	nebc
–	Connecting cable	NEBC-A1W3	For connecting the sensor interface CASM and potentiometer TLF	nebc
[4]	Connecting cable	NEBP-M16W6	For connecting the measuring module CPX-CMIX and displacement encoder MME	8

Datasheet

The measuring module CPX-CMIX is intended exclusively for use with valve terminals CPX.

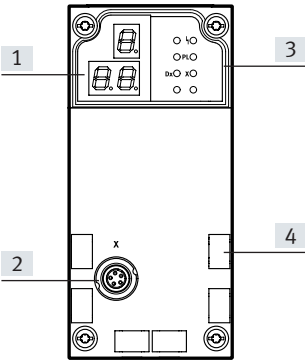


General technical data			
Operating voltage			
Operating voltage range		[V DC]	18 ... 30
Nominal operating voltage		[V DC]	24
Current consumption at nominal operating voltage		[mA]	80
Short circuit current rating			Yes
Power failure buffering		[ms]	10
No. of axis strings			1
Axes per string			1
Length of connecting cable to axis		[m]	≤ 30
Max. number of modules			9
Display			7-segment display
Assigned addresses	Outputs	[Bit]	6x8
	Inputs	[Bit]	6x8
Diagnostics			Channel- and module-orientated
			Via local 7-segment display
			Undervoltage of modules
			Undervoltage of measuring system
Status indicator			Power load
			Error
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]	140
Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

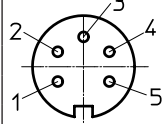
Datasheet

Operating and environmental conditions		
Ambient temperature	[°C]	−5 ... +50
Storage temperature	[°C]	−20 ... +70
Relative humidity	[%]	5 ... 95, non-condensing
Degree of protection to IEC 60529		IP65

Connection and display components



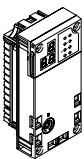
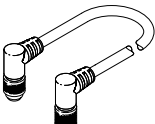
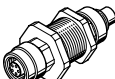
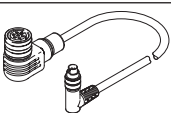
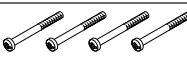
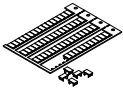
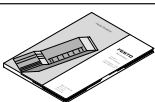
- [1] 3-digit display
- [2] Control interface
- [3] Status LEDs
- [4] Inscription labels

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 CMIX modules
CPX-CEC...	–	9
CPX-FB11	DeviceNet ¹⁾	9
CPX-FB13	PROFIBUS ²⁾	9
CPX-FB14	CANopen	5
CPX-FB23-24	CC-LINK [®]	5 (as function module F23)
		9 (as function module F24)
CPX-FB36	EtherNet/IP	9
CPX-FB37	EtherCAT [®]	9
CPX-FB39	Sercos III	9
CPX-FB40	POWERLINK	9
CPX-FB43	PROFINET RT, M12	9
CPX-M-FB44	PROFINET RT, RJ45	9
CPX-M-FB45	PROFINET RT, SCRJ	9

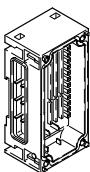
1) As of revision 20 (R20)
2) As of revision 23 (R23)

Accessories

Ordering data		Brief description	Part no.	Type
Measuring module				
	Order code in the CPX configurator: T23		567417	CPX-CMIX-M1-1
Connecting cables				
	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
	For displacement encoder MME: Connection between displacement encoder MME and measuring module CPX-CMIX	2 m	575898	NEBP-M16W6-K-2-M9W5
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 – Measuring module CPX-CMIX ¹⁾	German	567053	P.BE-CPX-CMIX-DE
		English	567054	P.BE-CPX-CMIX-EN
		Spanish	567055	P.BE-CPX-CMIX-ES
		French	567056	P.BE-CPX-CMIX-FR
		Italian	567057	P.BE-CPX-CMIX-IT

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

Accessories

Ordering data				
	Brief description		Part no.	Type
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