

Measuring modules CPX-CMIX



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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

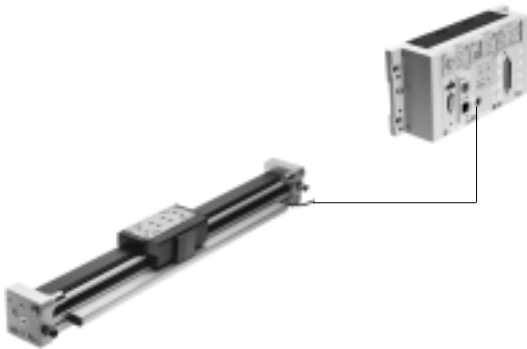
All process steps are measured and documented, which significantly improves quality. The adjustable contact force (via pressure regulator) also increases the precision of the “displacement sensor”.

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

1) Always refers to max. stroke.

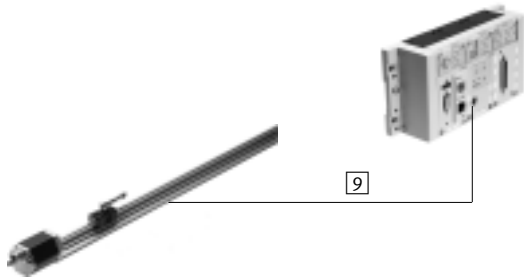
2) Stroke ≤ 1000 mm/stroke > 1000 mm

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Drives to use

Displacement encode MME



- The measurement signal of the 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

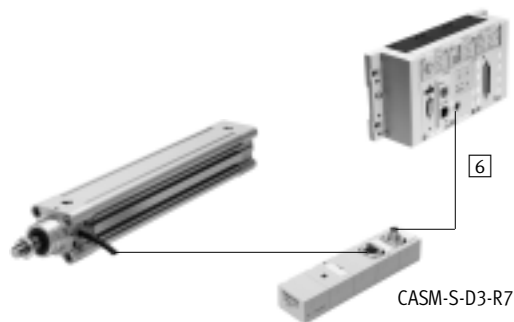
Technical data

Linearity error ¹⁾	[%]	< ±0.01, min. ±40µm
Resolution	[mm]	0.01
Repetition accuracy ²⁾	[mm]	±0.01/±0.02
Hysteresis	[µm]	< 4
Maximum temperature coefficient	[ppm/°K]	15
Smallest 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, 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

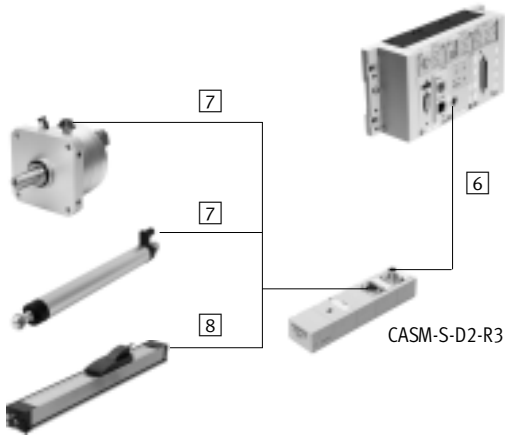
Linearity error		
Strokes up to 500 mm	[mm]	< ±0.08
Strokes up to 1000 mm	[mm]	< ±0.09
Strokes over 1000 mm	[mm]	< ±0.11
Resolution	[mm]	0.01
Repetition accuracy	[mm]	< ±0.02
Hysteresis	[mm]	< 0.03
Smallest measurable speed	[mm/s]	10

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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 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						
Smallest 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						
Smallest measurable speed	[mm/s]	18	23	31	38	46	53	61
Temperature coefficient	[ppm/°K]	5						

1) Refers to max. swivel angle

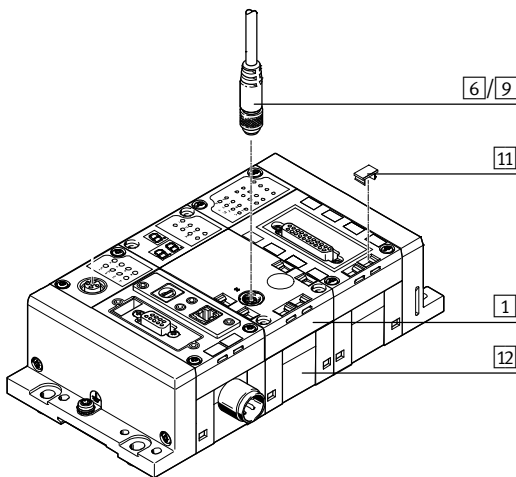
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Type codes and peripherals overview

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	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 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 PA		
Note on materials	RoHS-compliant		
Product weight	[g]	140	
Dimensions	Length	[mm]	107
	Width	[mm]	50
	Height	[mm]	55

Measuring modules CPX-CMIX

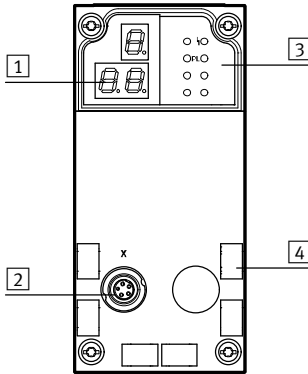
Technical data

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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
CPX-FEC	-	9
CPX-CEC...	-	9
CPX-FB6	INTERBUS	2
CPX-FB11	DeviceNet ¹⁾	9
CPX-FB13	PROFIBUS ²⁾	9
CPX-FB14	CANopen	5
CPX-M-FB20	INTERBUS	2
CPX-M-FB21	INTERBUS	2
CPX-FB23-24	CC-Link	5 (function module F23)
		9 (function module F24)
CPX-FB32	EtherNet/IP	9
CPX-FB33	PROFINET RT, M12	9
CPX-M-FB34	PROFINET RT, RJ45	9
CPX-M-FB35	PROFINET RT, SCRJ	9
CPX-FB36	EtherNet/IP	9
CPX-FB37	EtherCAT	9
CPX-FB38	EtherCAT	9
CPX-FB39	Sercos III	9
CPX-FB40	POWERLINK	9
CPX-M-FB41	PROFINET RT	9

1) With Revision 20 (R20)

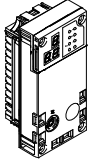
2) With Revision 23 (R23)

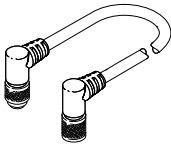
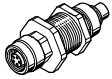
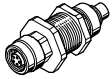
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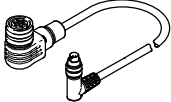
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Accessories

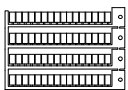
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Ordering data – Measuring module			
	Description	Part No.	Type
	Order code in the CPX configurator: T23	567417	CPX-CMIX-M1-1

Ordering data – Connecting cables			
	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 displacement encoder MME and measuring module CPX-CMIX			
	Description	Cable length [m]	Part No. Type
	For displacement encoder MME	2	575898 NEBP-M16W6-K-2-M9W5

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

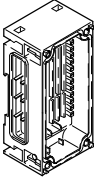
Ordering data – Inscription labels			
	Description	Number	Part No. Type
	Inscription labels 6x10, in frames	64	18576 IBS-6X10


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

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

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Accessories

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
	With additional power supply for valves	7/8" – 4-pin	541250	CPX-GE-EV-Z-7/8-4POL
		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