Automation with function integration

The pneumatic and electric modules of valve terminal CPX/MPA

Fieldbus nodes and Industrial Ethernet

Type	CPX-FB6	CPX-FB11	CPX-FB13	CPX-FB14	CPX-M-FB20	CPX-M-FB21	CPX-FB23	CPX-FB32	CPX-FB33	CPX-M-FB34	CPX-M-FB35	CPX-FB36	CPX-FB37	CPX-FB38	CPX-FB39	CPX-FB40	CPX-FEC-1-IE
Order code	F06	F11	F13	F14	F20	F21	F23	F32	F33	F34	F35	F36[1]	F37[1]	F38	F39[1]	F40[1]	T05
Part no.	195 748	526 172	195 760	526 174	572 334	572 221	526 176	541 302	548 755	548 753	548 749	1 957 451	2 735 960	552 046	2 093 101	2 624 896	529 041
Fieldbus protocol	INTERBUS	DeviceNet	PROFIBUS DP	CANopen	INTERBUS	INTERBUS	CC-Link	EtherNet/IP	PROFINET IO			EtherNet/IP	EtherCAT	EtherCAT	Sercos III	POWERLINK	Modbus TCP
Fieldbus interface	• Sub-D, 9-pin, socket and pin • M12 5-pin, B-coded • Socket and pin	• Sub-D, 9-pin, pin • M12 5-pin, A-coded • Screw terminal	• Sub-D, 9-pin, socket • M12 5-pin, B-coded • Socket and pin	• Sub-D, 9-pin, pin • M12 5-pin, A-coded • Screw terminal	• Rugged Line fibre-optic cable	• Rugged Line fibre-optic cable	• Sub-D 9-pin, socket • Screw terminal	• M12 5-pin, D-coded	• M12 5-pin, A-coded	• AIDA[1] push-pull	• AIDA[1] fibre-optic cable	• M12 5-pin, D-coded	• M12 5-pin, D-coded	• M12 5-pin, D-coded • Can be replaced with F37	• M12 5-pin, D-coded	• M12 5-pin, D-coded	• M12 5-pin, D-coded
Address volume Inputs	4 bytes	64 bytes	64 bytes	64 bytes	12 bytes	12 bytes	64 bytes	64 bytes	64 bytes			64 bytes	64 bytes	64 bytes	64 bytes	64 bytes	64 bytes
Address volume Outputs	4 bytes	64 bytes	64 bytes	64 bytes	12 bytes	12 bytes	64 bytes	64 bytes	64 bytes			64 bytes	64 bytes	64 bytes	64 bytes	64 bytes	64 bytes

[1] Available in 2014. [2] AIDA = **Automation Initiative** of **German Domestic Automobile** manufacturers

Control block

Type	CPX-FEC-1-IE	CPX-CEC	CPX-CEC-C1	CPX-CEC-M1
Order code	T03	T06	T07	T08
Part no.	539 041	567 366	567 367	567 368
Programming software interface/connection	Serial interface (Sub-D, RS232) for connecting PCs for programming as well as operator units such as Front End Display FED.	CODESYS controller with CANopen master for connecting additional field devices. Type M1 additionally with SoftMotion library for 2.5D interpolation.		
Baud rate	Ethernet 10/100 Base-T (RJ45)			
Description	The optional Front End Controllers CPX-FEC and CPX-CEC enable simultaneous access via Ethernet and an integrated web server (in the case of CPX-FEC), in parallel with a fieldbus node, as well as stand-alone preprocessing. Access via Modbus/TCP and Easy IP is also possible. Commissioning, programming, and diagnostics with the Festo software tool FST or CODESYS.			

The capabilities of CPX/MPA

Possible only with CPX electrical peripherals from Festo: the almost limitless options for function integration on valve terminals and the CPX as remote I/O. Function integration reduces the costs along your entire value chain. Read more about the potential cost savings in our white paper "Function integration".

Single-platform solutions

- Digital and analogue standard tasks
- Demanding I/O tasks with single-channel diagnostics and parameterisation
- Temperature, displacement and pressure measurement
- Electrical and pneumatic safety functions
- Integrated, comprehensive diagnostics and condition monitoring
- Subordinate, decentralised installation system

Combine these functions directly with the operating elements

- Pilot or process valves
- Control valves for cylinders, grippers, vacuum
- Pressure regulators
- Servopneumatic positioning systems
- Electric drives and axes

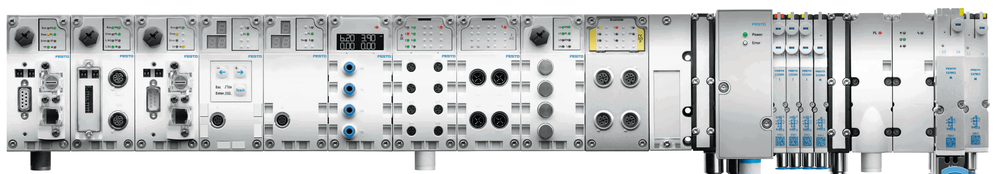
For control, choose from fieldbus/Ethernet as remote I/O or the following front-end controllers:

- CPX-FEC (Festo mini control system)
- CPX-CEC (CODESYS controller with 32-bit processor, 400 MHz, CANopen master)
- PC Worx (controller for control environments from Phoenix Contact)

→ **www.festo.de/katalog/mpa**

Modular system number

Type	Order code	Part no.	Designation
MPA-FB-VI	32P	530 411	Valve terminal MPA with fieldbus
MPA-MPM-VI	32P	539 105	Valve terminal MPA with multi-pin plug
MPA-ASI-VI	32P	546 279	Valve terminal MPA with AS-Interface
MPA-CPI-VI	32P	546 280	Valve terminal MPA with CP Interface (CPI system)
CPX	S0E	197 330	Modular electrical terminal CPX (without valve terminal)
	S1E		Modular electrical terminal CPX with metal interlinking
	S3E		Modular electrical terminal CPX for control cabinet construction, IP20
	S4E		Modular electrical terminal CPX, intrinsically safe IS modules are possible



Electronic modules

Type	CPX-8DE	CPX-4DE	CPX-8DE-D	CPX-8NDE	CPX-16DE	CPX-M-16DE-D	CPX-8DE-8DA	CPX-4DA	CPX-8DA	CPX-8DA-H	CPX-2AE-U-I	CPX-2AA-U-I	CPX-4AE-I	CPX-4AE-U-I	CPX-4AE-P-B2	CPX-4AE-P-D10	CPX-4AE-T
Order code	E	F	D	O	M	NM	Y	A	L	NL	U	P	I	NI	NV	NY	T
Part no.	195 750	195 752	541 480	543 813	543 815	550 202	526 257	195 754	541 482	550 204	526 168	526 170	541484	573 710	560 361	560 362	541 486
Number of inputs	8	4	8	8	16	16	8	–	–	–	2	–	4	4	4	4	–
Number of outputs	–	–	–	–	–	–	8	4	8	8	–	2	–	–	–	–	4
Switching logic/resolution	PNP	PNP	PNP	NPN	PNP	PNP	PNP	PNP	PNP	PNP	12 bits 0-10 V 0-20 mA 4-20 mA	12 bits 0-10 V 0-20 mA 4-20 mA	12 bits 0-20 mA 4-20 mA	12 bits 0-10 V, 0-20 mA 4-20 mA, ±10 V, ±20 mA, ±5 V	10 bits	10 bits 0...10 bar	12 bits Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni500, Ni1000, 2-, 3- or 4-wire technology
Signal range	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Type B, E, J, K, N, R, S, T, 2-wire technology
Max. current supply per channel	0,5 A	0,5 A	0,5 A	0,5 A	0,5 A	0,5 A	0,5 A	1 A	0,5 A	2,1 A	0,7 A	2,8 A	0,7 A	0,7 A	–	–	–

Type	CPX-AE-TC	CPX-L-16DE-16-KL-3POL	CPX-L-8DE-8DA-16-KL-3POL	CPX-FVDA-P2	CPX-P-8-DE-N	CPX-P-8-DE-N-IS	CPX-2/2E20A
Order code	NT	NB	NC	NG	E8	EW	T25
Part no.	553 594	172 606	572 607	1 971 599	565 933	565 934	576 046
Number of inputs	–	16	8	3	8	8	2 high-speed inputs
Number of outputs	–	–	8	3	8	8	2 high-speed outputs
Switching logic/resolution	12 bits	PNP	PNP	PROFIsafe	NAMUR	NAMUR	PNP/PWM
Signal range	Type B, E, J, K, N, R, S, T, 2-wire technology	–	–	–	–	–	Inputs up to 100 kHz/1 MHz at 24 V/5 V, outputs up to 20 kHz (PWM), controller for 24 V DC motor
Max. current supply per channel	–	0,25 A	0,25 A	1,5 A	–	–	–

Fieldbus plug connectors

Type	FBS-SUB-9-GS-DP-B	FBA-2-M12-5POL-RK	CPX-AB-2-M12-RK-DP	FBS-SUB-9-BU-IB-B	FBS-SUB-9-GS-IB-B	CPX-AB-2-M12-RK-IB	FBS-SUB-9-BU-2x5POL-B	FBA-2-M12-5POL	FBSD-GD-9-5POL	FBS-M12-5GS-PG9	FBA-1-SL-5POL	FBSD-KL-2x5POL	FBS-SUB-9-GS-2x4POL-B	FBA-1-KL-5POL
Order code	G0	G2	GQ	G4	G8	GP	GD	GA	–	–	–	–	GB	–
Part no.	532 216	533 118	541 519	532 218	532 217	534 505	532 219	525 432	18 324	175 380	525 434	525 435	532 220	197 962
Designation	Fieldbus plug, Sub-D, IP65/IP67, 9-pin, pin	Fieldbus connection, 2x M12, 5-pin, socket	Fieldbus connection, 2x M12, B-coded	Fieldbus plug, Sub-D, IP65/IP67, 9-pin, socket	Fieldbus plug, Sub-D, IP65/IP67, 9-pin, pin	Fieldbus connection, 2x M12, B-coded	Fieldbus plug, Sub-D, IP65/IP67, 9-pin, socket	Fieldbus connection, 2x M12, A-coded	Fieldbus socket, M12, 5-pin, socket, A-coded, incoming	Fieldbus plug, M12, 5-pin, pin, A-coded, outgoing	Fieldbus connection, 5-pin, pin strip	Terminal strip, screw connection (open style)	Fieldbus plug, Sub-D, IP65/IP67, 9-pin, pin	Fieldbus connection, 5-pin, screw terminal strip
	DeviceNet	CAN open											CAN open	CC-Link

Plug connectors/software technology modules

Type	FBS-SUB-9-GS-1x9POL-B	FBS-RJ45-8-GS	NECU-M-S-B12G5-C2-PB	NECU-M-B12G5-C2-PB	CACR-S-B12G5-220-PB	NECU-M-S-D12G4-C2-ET	FBS-RJ45-PP-GS	FBS-SCRJ-PP-GS	CPX-M-AK-C
Order code	–	G4	GA	GB	GC	–	G2	G4	BC
Part no.	534497	534 494	106 635 4	106 790 5	107 212 8	543 109	552 000	571 017	548 753
Designation	Fieldbus plug, Sub-D, IP65/IP67, 9-pin, pin	Ethernet plug, RJ45, IP65/IP67, 8-pin	Straight plug, outgoing M12x1, 5-pin, B-coded, screened	Straight socket, incoming, M12x1, 5-pin, B-coded, screened	Terminating resistor	Straight plug/screw terminal M12x1, 4-pin, screened, D-coded Industrial Ethernet	Plug, RJ45 (Ethernet, push-pull)	Plug, fibre-optic cable (Ethernet, push-pull)	Cover cap for push-pull
	CPX-CEC/CPX-FEC								

Motion control technology modules for electric drives and servopneumatics

Type	CPX-CEC-C1	CPX-CEC-M1	CPX-CMXX	CPX-CM-HPP
Order code	T07	T08	T20	T22
Part no.	567 367	567 368	548 931	562 214
Fieldbus protocol	CODESYS	CODESYS Softmotion 2.5D	FHPP-Max	FHPP
Description	CANopen master for connecting additional field devices	CANopen master for connecting additional field devices		

CPX-CMAX

- Position and force control, directly actuated or selected from one of 64 configurable positioning sets
- The configurable function for switching to the next set enables simple functional sequences to be realised.
- The auto-identification function identifies each station with its device data on the controller.
- Control of a brake or clamping unit via the proportional directional control valve VPWP

CPX-CMPX

- Fast travel between the mechanical end stops of the cylinder, moving gently and without impact into the end position + 2 mid-positions
- Fast commissioning via control panel, fieldbus or handheld unit
- Improved control of downtime
- Control of a brake or clamping unit via the proportional directional control valve VPWP
- All system data can be read and written via the fieldbus, including the mid-positions, for example.

Measuring module CPX-CMIX-M1-1

Turns pneumatic cylinders into sensors, and is unique worldwide due to its completely digital data acquisition and data transmission. Repetition accuracy of ±0.01 mm with integration of digital transducers.

[1] Depending on the displacement encoder

- Space and time-saving: retracting/advancing and measuring in one step
- Reduced cycle time: stroke-dependent triggering of downstream process steps
- Improved quality: process steps are measured and documented
- Faster and more reliable commissioning thanks to harmonised system

Decentralised installation system CPI

Type	CPX-CP-4-FB
Order code	T11 to T18
Part no.	526 705
No. of CP strings	6
String length	Max. 10 m
No. of CP modules per string	• Up to 4 strings with up to 6 modules each and up to 32 I/O per string • Power supply and bus interface via the same cable

CP interface for decentralised installation systems, thus optimising the pneumatic control chains (short tubes/short cycle times)

Installation system CTEL

Type	CPX-CTEL-4-M12-5POL	CPX-CMAX-C1-1
Order code	T40 to T44	T21
Part no.	1 577 012	548 932
Number of connections	4	
Cable length	Max. 20 m	
Number of modules per connection	• One I-port module per connection	

The CPX-CTEL master from Festo enables modules with an I-port interface to be connected to a CPX system, such as a valve terminal or an I/O module.

Type	CPX-CMAX-C1-1		
Order code	T21		
Part no.	548 932		
Moving masses	Horizontal	1...300 kg	
	Vertical	1...100 kg	
Regulated force at 6 bar	30...2700 N		
Positioning accuracy	±0.2 mm		
Travel speed	Max. 3 m/s		
Acceleration	Max. 30 m/s²		

Type	CPX-CMPX-C-1-H1		
Order code	T20		
Part no.	548 931		
Moving masses	Horizontal	1...300 kg	
	Vertical	1...100 kg	
Mid-positions	Up to two freely programmable mid positions, including via the fieldbus		
Positioning accuracy	Accuracy ± 0.25% of the displacement encoder length, but at least ± 2 mm		
Fast, vibration-free travel between 2 fixed stops			

Type	CPX-CMPX-M1-1
Order code	T23
Part no.	567 617
Repetition accuracy	DGCI and DNCI: ±0.01 mm Stroke-dependent potentiometer <360 mm – ±0.01 mm; ≥360 mm – ±0.06 mm
Max. cable length between the controller and the drive: 30 m	

End plates and pneumatic interface for fieldbus and multi-pin plug connection

Designation	Type	Order code	Part no.
Pneumatic interface, flat plate silencer, internal pilot air	VMPA-FB-EPL-GU	S	533 372
Pneumatic interface, flat plate silencer, external pilot air	VMPA-FB-EPL-EU	T	533 371
Pneumatic interface, ducted exhaust air, internal pilot air	VMPA-FB-EPL-G	V	533 370
Pneumatic interface, ducted exhaust air, external pilot air	VMPA-FB-EPL-E	X	533 369
Pneumatic interface, flat plate silencer, internal pilot air, for CPX metal interlinking module	VMPA-FB-EPLM-GU	S	552 288
Pneumatic interface, flat plate silencer, external pilot air, for CPX metal interlinking module	VMPA-FB-EPLM-EU	T	552 287
Pneumatic interface, ducted exhaust air, internal pilot air, for CPX metal interlinking module	VMPA-FB-EPLM-G	V	552 286
Pneumatic interface, ducted exhaust air, external pilot air, for CPX metal interlinking module	VMPA-FB-EPLM-E	X	552 285
Right-hand end plate	VMPA-EPR		533 373
Right-hand end plate with exhaust for 82/84	VMPA-EPR-G[1]		8 029 133

[1] Available in 2014

Designation	Type	Order code	Part no.
Internal pilot air, silencer	VMPA1-MPM-EPL-GU	S	540 896
External pilot air, silencer	VMPA1-MPM-EPL-EU	T	540 895
Internal pilot air, ducted exhaust air	VMPA1-MPM-EPL-G	V	540 894
External pilot air, ducted exhaust air	VMPA1-MPM-EPL-E	X	540 893

Connecting cable

Designation	Type	Part no.
Hood without connecting cable for self-assembly	VMPA-KMS-H	533 198
PVC connecting cable for 8 solenoid coils	2.5 m	VMPA-KMS1-8-2,5	533 195
	5 m	VMPA-KMS1-8-5	533 196
	10 m	VMPA-KMS1-8-10	533 197
PVC connecting cable for 24 solenoid coils	2.5 m	VMPA-KMS1-24-2,5	533 192
	5 m	VMPA-KMS1-24-5	533 193
	10 m	VMPA-KMS1-24-10	533 194
PUR connecting cable for 8 solenoid coils, suitable for energy chains	2.5 m	VMPA-KMS2-8-2,5-PUR	533 504
	5 m	VMPA-KMS2-8-5-PUR	533 505
	10 m	VMPA-KMS2-8-10-PUR	533 506
PUR connecting cable for 24 solenoid coils, suitable for energy chains	2.5 m	VMPA-KMS2-24-2,5-PUR	533 501
	5 m	VMPA-KMS2-24-5-PUR	533 502
	10 m	VMPA-KMS2-24-10-PUR	533 503

Sub-base variants, pressure supply and auxiliary pilot air

Order code	S	T	V	X
Auxiliary pilot air	Internal Branched from 1 in the pneumatic interface	External Connected at port 12/14	Internal Branched from 1 in the pneumatic interface	External Connected at port 12/14
Operating data	3 ...8 bar	-0,9 ... 10 bar	3 ...8 bar	-0,9 ... 10 bar
Exhaust	Silencer: Port 3/5 and 82/84, exhaust through silencer at pneumatic interface and supply plate		Ducted exhaust air: Port 3/5 on pneumatic interface and supply plate, port 82/84 on obligatory right-hand supply plate	

Type	Order code	Part no.	Size 1	Size 2	Number of valve positions	Notes
VMPA1-FB-AP-X-1	A, C*	533 352	•	–	4 (8/4*)	Working ports (2, 4) on sub-base • Port sizes: MPA1: M7, QS4, QS6 • Code I: separation in duct 1 in the sub-base • Code III: separation in duct 1 and duct 3/5 in the sub-base
VMPA1-FB-AP-X-1-T1	AL, CI*	538 657	•	–	4 (8/4*)	
VMPA1-FB-AP-X-1-S1	AIII, CIII*	555 901	•	–	4 (8/4*)	
VMPA2-FB-AP-2-1	B, D*	538 000	–	•	2 (4/2*)	Working ports (2, 4) on sub-base • Port sizes MPA2: G1/8, QS6, QS8 • Code I: duct 1 in the sub-base separate • Code III: duct 1 and duct 3/5 in the sub-base separate
VMPA2-FB-AP-2-1-T0	BL, DI*	538 677	–	•	2 (4/2*)	
VMPA2-FB-AP-2-1-S0	BIII, DIII*	555 902	–	•	2 (4/2*)	
VMPA-FB-AP-P1**	QX, QZ	542 223			1	Working port (2): • Port sizes G1/4, QS6, QS8 Supply port (1): • Port sizes G1/4, QS8, QS10 Variant QX: external pressure control Variant QZ: pressure zone control

* Possible only with multi-pin plug connection ** For proportional pressure regulators

Working port

Order code	G	F	C
MPA1 Type	4 mm push-in connector QSM-M7-4-I	4 mm push-in connector QSM-M7-4-I	M7 thread
Part no.	153 321	153 319	
MPA2 Type	8 mm push-in connector QSM-G1/8-8-I	6 mm push-in connector QSM-G1/8-6-I	G1/8 thread
Part no.	186 108	186 107	
Prop. valve Type	8 mm push-in connector QS-G1/8-8-I	6 mm push-in connector QS-G1/8-6-I	G1/8 thread
Part no.	186 110	186 108	

Supply port on the pneumatic interface

Order code	L	K	D
Supply air (1) Type	10 mm push-in connector QS-G1/8-10-I	8 mm push-in connector QS-G1/8-8-I	G1/8 thread
Part no.	186 112	186 110	
Pilot air (12/14, 82/84) Type	6 mm QSM-M7-6-I		M7
Part no.	153 321		

Extremely flexible connections: the connection technology

Additional supply plates can be used for larger terminals or to create pressure zones.

If several valves are to be operated simultaneously at full flow rate, it is recommended that a supply plate be positioned after every 8 valves (MPA1), or 4 valves (MPA2). Supply plates can be configured at any point upstream or downstream of the sub-bases. This applies to the following interfaces:

- MPA with CPX
- MPA with multi-pin plug connection
- MPA with AS-Interface connection
- MPA with CPI connection

MPA with ducted exhaust air

At least one supply plate via which the exhaust port 82/84 is vented is required with ducted exhaust air. Supply plates contain the following ports:

- Compressed supply (1)
- Venting of the pilot air supply (82/84) and pressure compensation
- Exhaust air (3/5)

Depending on your order, the exhaust ducts are either ducted or vented via the flat plate silencer.

The supply plate is configured using the code letter U if no directly adjoining separating seal is required. If a separating seal (S, T or R) is selected directly to the right or left of the supply plate, then the code letter V or W identifies the position of the left-hand or right-hand separating seal. The code for the separating seal (S, T or R) is placed in front of the code for the supply plate (V or W).

Type	Order code	Part no.	Notes
VMPA1-...-SP-...	U		Supply plate without separating seal (no R, S or T selected)
VMPA1-...-SP-...	V		Supply plate with separating seal on left, if R, S or T selected
VMPA1-...-SP-...	W		Supply plate with separating seal on the right, if R, S or T is selected
VMPA1-FB-SPU	533 353		Supply plate for flat plate silencer
VMPA1-FB-SP	533 354		Supply plate for ducted exhaust air
VMPA-APU	533 374		Flat plate silencer
VMPA-AP	533 375		For ducted exhaust air, with 10 mm push-in connector
VMPA-AP-GS	2 598 313		For ducted exhaust air, ports 3 and 5 separated

MPA offers a number of options for creating pressure zones if different working pressures are required. Depending on the electrical interface, up to 16 pressure zones are possible.

A pressure zone is created by isolating the internal supply ducts between the sub-bases using an appropriate separating seal or using a separator that is permanently integrated in the sub-base (code I or code III). Compressed air is supplied and vented via a supply plate.

The position of the supply plates and separating seals can be freely selected with the valve terminal MPA. Separating seals are integrated as works as per your order. Separating seals can be distinguished through their coding, even when the valve terminal is assembled.

Order code	Separating seal for operating with flat plate silencer		Separating seal for operating with ducted exhaust air		Notes
	Illustrated examples	Coding	Illustrated examples	Coding	
–	VMPA1-DPU 533 355		VMPA1-DP 533 359		No duct separation
T	VMPA1-DPU-P 533 356		VMPA1-DP-P 533 363		Duct 1 separated
S	VMPA1-DPU-PRS 533 358		VMPA1-DP-PRS 533 365		Duct 1 and 3/5 separated
R	VMPA1-DPU-RS 533 357		VMPA1-DP-RS 533 364		Duct 3/5 separated

Note

The following must be taken into consideration for subsequent expansion or conversions: Different separating seals are required for operating with ducted exhaust air and operation with flat plate silencers.

MPA with CPX

Additional electrical supply plates can be used for larger terminals. This enables up to 64 valve positions/128 solenoid coils to be supplied.

Electrical supply plates can be configured at any point upstream or downstream of sub-bases. An electrical supply plate is required after 8 valve sub-bases.

Note

Please note that only the electronic modules with a separate circuit are permitted to the right of the electrical supply plate. The electrical supply plate must not be installed directly to the left of a pneumatic supply plate (type VMPA1-FB-SP...).

Designation	Type	Part no.
Plug connection M18, 3-pin	VMPA-FB-SP-V	541 082
Plug connection 7/8, 5-pin	VMPA-FB-SP-7/8-V-5POL	541 083
Plug connection 7/8, 4-pin	VMPA-FB-SP-7/8-V-4POL	541 084

Pressure sensors

The pressure sensor indicates whether the applied pressure exceeds, conforms to or falls below the setpoint value using three LEDs. An additional LED indicates common errors (limit exceeded or fallen below).
The limits for pressure monitoring are set by means of parameterisation. The pressure sensor plate can be parameterised via the PLC or the Festo handheld unit (CPXMM). Alternatively the pressure in the exhaust duct (3/5) and the process pressure (external) can be measured. Pressure measurement in the exhaust duct is used for monitoring the operating pressure during reversible operation (supply to (3/5)).

Type	Order code	Part no.	Use
VMPA-FB-PS-1	PE	541 085	Monitoring the operating pressure in duct 1
VMPA-FB-PS-3/5	PF	541 086	Monitoring the pressure in exhaust ducts 3 and 5 (monitoring the exhaust performance or pressure monitoring for a reversibly operated valve terminal)
VMPA-FB-PS-P1	PG	541 087	Monitoring an external process pressure

Supply plates – Creating pressure zones and separating exhaust air – Pressure sensors

Electricalsupply plate

Manifold block

Electronic module

Interlinking block

Type	CPX-AB-4-M12x2-5POL	CPX-AB-8-M8-3POL	CPX-AB-4-HARxI-4POL	CPX-AB-8-KL-4POL	CPX-AB-1-SUB-BU-25POL	CPX-AB-4-M12-8POL	CPX-AB-8-M8x2-4POL	CPX-AB-4-M12x2-5POL-R	CPX-AB-8-KL-4POL	AK-8KL	CPX-AB-4-M12x2-5POL	CPX-AB-5-4-M12	CPX-M-4-M12x2-5POL	CPX-M-8-M12x2-5POL	CPX-P-AB-2xR1-8POL	CPX-P-AB-2xR1.8POL-BDE-N-IS	CPX-P-AB-4xM12-4POL-BDE-N-IS
Order code	X	R	H	I	B	C	GQ	GW	KJ	KP	W	KA	KB	BJR	BXR	BW	BXW
Part no.	195 704	195 706	525 636	195 708	525 676	526 178	541 256	541 254	195 708	538 219	195 704	526 184	569 367	569 335	565 704	565 703	565 705
Connection	M12, 5-pin	M8, 3-pin	Harax, 4-pin	CageClamp, 4-pin	Sub-D, 25-pin	M12, 8-pin	M8, 4-pin	M12, 5-pin, A-coded		CageClamp, 4-pin, with cover in IP65		M12, 5-pin	M12, 5-pin	M12, 5-pin	Terminal	M12, 4-pin	Terminal	M12, 4-pin
Number of sockets	4	8	4	8	1	4	8	4		8	4	4	8	8	4	8	4
Protection class	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67	IP20	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67	IP20	IP65/IP67	IP20	IP65/IP67
Combinations																		
CPX-8DE	E	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-4DE	F	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-8DE-D	D	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-8NDE	O	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-16DE	M			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-M-16DE-D	NM			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-8DE-8DA	Y			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-4DA	A	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-8DA	L	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-8DA-H	NL			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-2AE-U-I	P	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-2AA-U-I	P	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-4AE-I	I	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-4AE-U-I	NI	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-4AE-T	T	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-4AE-TC	NT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
CPX-PRDE-N	BR														•	•	•	•
CPX-PRDE-N-IS	BW														•	•	•	•
CPX-FVDA-P2	NG																	

The connection technology for sensors and additional actuators offers a wide range of digital and analogue input and output modules and is freely selectable – as appropriate to your standard or application. Plastic or metal connection blocks can be combined as required:

Metal version

- M12-5POL

Plastic version

- M12-5POL, M12-5POL with screw-type lock and metal thread, M12-8POL, M8-3POL, M8-4POL, Sub-D, HaraxR, CageClamp® (with cover, also for IP65/67)

Plug connectors for inputs and outputs

Connection technology M12

Type	SEA-GS-7	SEA-GS-9	SEA-4GS-7-2,5	SEA-M12-5GS-PG7	SEA-GS-11-DUO	SEA-5GS-11-DUO	KM12-DUO-M8-GDGO	KM12-DUO-M8-GDWO	KM12-DUO-M8-WDWO
Order code	S	T	W	P	X	K	–	–	–
Part no.	18 666	18 778	192 008	175 487	18 779	192 010	18 685	18 688	18 687
Designation	Sensor plug, straight, M12, PG7, 4-pin, for cable diameter 4.0-6.0 mm	Sensor plug, straight, M12, PG9, 4-pin, for cable diameter 6.0-8.0 mm	Sensor plug, straight, M12, PG9, 4-pin, 2,5 mm², for cable diameter 2.5-2.9 mm	Sensor plug, straight, M12, PG7, 5-pin, for cable diameter 4.0-6.0 mm, metal thread	Sensor plug, straight, M12, DUO, 4-pin	Sensor plug, straight, M12, DUO, 5-pin	DUO cable, M12 to M8, 2x straight socket	DUO cable, M12 to M8, 2x straight/angled	DUO cable, M12 to M8, 2x angled socket

Sub-D connection technology

Type	SD-SUB-D-ST25	SD-SUB-D-ST25-SM	SD-SUB-D-ST25-10M
Order code	F	–	–
Part no.	527 522	543 473	543 474
Designation	Sub-D plug, 25-pin	Cable, Sub-D, 25-pin, 5 m, open end	Cable, Sub-D, 25-pin, 10 m, open end

Harax connection technology

Type	SEA-GS-HAR-4pol
Order code	A
Part no.	525 928
Designation	Harax sensor plug, 4-pin

M8, 3-pin connection technology

Type	SEA-3GS-M8-S	SEA-GS-M8
Order code	C	B
Part no.	192 009	18 696
Designation	Straight sensor plug, M8, screw-in	Straight sensor plug, M8, solderable

M8, 4-pin connection technology

Type	NECU-S-M8G4-C2
Order code	GD
Part no.	106 898
Designation	Sensor plug, straight, M8, 4-pin

Cover caps, for protection class IP65/IP67

Type	ISK-M8	ISK-M12
Order code	BA	BA
Part no.	177 672	165 592
Designation	Cover caps for M8	Cover caps for M12

Interlinking blocks and power supply

Plastic interlinking block – Interlinking by means of tie rods

System interlinking

- Supply of the modules with the various voltage values
- Serial communication between the modules

System supply

- M18, 4-pin
- 7/8 inches, 4- or 5-pin

In addition to system interlinking, power supply for the

- Electronics plus sensors (16 A)
- Valves plus actuators (16 A)

Additional power supply

- In addition to system interlinking, power supply for the actuators (16 A per supply)
- Power supply for the valves (16 A per supply)

Expandability

- Can be expanded using an interlinking block with the rod CPX-ZA-1-E

Plastic interlinking

Type	CPX-GE-EV	CPX-GE-EV-S	CPX-GE-EV-Z	CPX-GE-EV-V	CPX-GE-EV-S-7/8-5POL
Order code	–	QS	QZ	QV	QP
Part no.	195 742	195 744	195 744	533 577	541 244
Connection	–	M18, 4-pin	M18, 4-pin	M18, 4-pin	7/8", 5-pin
Functions		Supply for: • 24 V sensors + electronics • 24 V actuators + valves • 0 V common • FE	Supply for: • 24 V actuators • 0 V actuators • FE	Supply for: • 24 V sensors + electronics • 24 V actuators + valves • 0 V sensors + electronics • 0 V actuators + valves • FE	Supply for: • 24 V sensors + electronics • 24 V actuators + valves • 0 V sensors + electronics • 0 V actuators + valves • FE

Individual interlinking, bolted

Type	CPX-ME-GE-EV	CPX-ME-GE-EV-S-7/8-5POL	CPX-ME-GE-EV-Z-7/8-5POL	CPX-ME-GE-EV-S-PP-5-POL	CPX-M-GE-EV-Z-PP-5-POL	CPX-ME-GE-EV-VI
Order code	–	QP	QR	QW/QN	QT	QF
Part no.	550 206	550 208	550 210	563 057	563 058	567 806
Connection	–	7/8", 5-pin	7/8", 5-pin	M18, 5-pin	M18, 5-pin	–
Functions		Supply for: • 24 V sensors + electronics • 24 V actuators • 0 V sensors + electronics • 0 V actuators + valves •

Automation with function integration

The pneumatic and electric modules of valve terminal CPX/VTSA

Fieldbus nodes and Industrial Ethernet

Type		CPX-F06	CPX-F11	CPX-F13	CPX-F814	CPX-M-F820	CPX-M-FB21	CPX-F823	CPX-F832	CPX-F833	CPX-M-FB34	CPX-M-FB35	CPX-F836	CPX-FB37	CPX-FB38	CPX-FB39	CPX-F840	CPX-FEC-1-1E
Order code		F06	F11	F13	F14	F20	F21	F23	F32	F33	F34	F35	F36[1]	F37[1]	F38	F39[1]	F40[1]	T05
Part no.		195 748	526 172	195 740	526 174	573 334	572 231	526 176	541 302	548 755	548 753	548 749	1 957 451	2 735 960	552 046	2 093 101	2 624 896	539 041
Fieldbus protocol		INTERBUS	DeviceNet	Profibus DP	CANopen	INTERBUS	INTERBUS	CC-Link	EtherNet/IP	PROFINET IO			EtherNet/IP	EtherCAT	EtherCAT	Sercos III	POWERLINK	Modbus TCP
Fieldbus interface		• Sub-D, 9-pin, socket and pin • M12 5-pin, B-coded • Socket and pin	• Sub-D, 9-pin, pin • M12 5-pin, A-coded	• Sub-D, 9-pin, socket • Screw terminal	• Sub-D, 9-pin, pin • M12 5-pin, A-coded	• Rugged Line fibre-optic cable	• Rugged Line fibre-optic cable	• Sub-D, 9-pin, socket • Screw terminal	• M12 5-pin, D-coded • Can be re-placed with faster F36	• M12 5-pin, D-coded	• AIDA[2] push-pull	• AIDA[2] fibre-optic cable	• M12 5-pin, D-coded	• M12 5-pin, D-coded	• M12 5-pin, D-coded • Can be replaced with F37	• M12 5-pin, D-coded	• M12 5-pin, D-coded	• RJ45 socket
Address volume	Inputs	4 bytes	64 bytes	64 bytes	64 bytes	12 bytes	12 bytes	64 bytes	64 bytes	64 bytes			64 bytes	64 bytes	64 bytes	64 bytes	64 bytes	64 bytes
	Outputs	4 bytes	64 bytes	64 bytes	64 bytes	12 bytes	12 bytes	64 bytes	64 bytes	64 bytes			64 bytes	64 bytes	64 bytes	64 bytes	64 bytes	64 bytes

[1] Available in 2014 [2] AIDA = **Automation Initiative** of **German Domestic Automobile** manufacturers

Control block

Type	CPX-FEC-1-1E	CPX-CEC	CPX-CEC-C1	CPX-CEC-M1
Order code	T03	T06	T07	T08
Part no.	539 041	567 366	567 367	567 368
Programming software Interface/Connector	Serial interface (Sub-D, RS232) for connecting PCs for programming as well as operator units such as Front End Display FED.	CODESYS controller with CANopen master for connecting additional field devices. Type M1 additionally with SoftMotion library for 2.5D interpolation.		
Baud rate	Ethernet 10/100 Base-T (RJ45)			
Description	The optional front end controllers CPX-FEC and CPX-CEC enable simultaneous access via Ethernet and an integrated web server (in the case of CPX-FEC), in parallel with a fieldbus node, as well as autonomous preprocessing. Access via Modbus/TCP and EasyIP is also possible. Commissioning, programming, and diagnostics with the Festo software tool FST or CODESYS.			

The capabilities of CPX/VTSA

Possible only with CPX electrical peripherals from Festo: the almost limitless options for function integration on valve terminals and the CPX as remote I/O. Function integration reduces the costs along your entire value chain. Read more about the potential cost savings in our white paper "Function integration".

Single-platform solutions

- Digital and analogue standard tasks
- Demanding I/O tasks with single-channel diagnostics and parameterisation
- Temperature, displacement and pressure measurement
- Electrical and pneumatic safety functions
- Integrated, comprehensive diagnostics and condition monitoring
- Subordinate, decentralised installation system

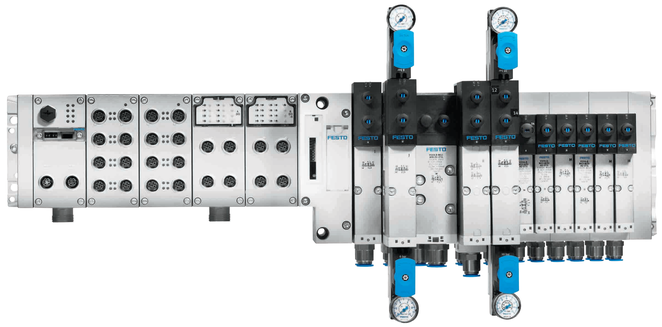
Combine these functions directly with the operating elements

- Pilot or process valves
- Control valves for cylinders, grippers, vacuum
- Pressure regulators
- Servopneumatic positioning systems
- Electric drives and axes

For control, choose from fieldbus/Ethernet as remote I/O or the following front end controllers:

- CPX-FEC (Festo mini control system)
- CPX-CEC (CODESYS controller with 32-bit processor, 400 MHz, CANopen master)
- PC Worx (controller for control environments from Phoenix Contact)

➔ **www.festo.de/katalog/vtsa**



Electronic modules

Type		CPX-8DE	CPX-4DE	CPX-8DE-D	CPX-8NDE	CPX-16DE	CPX-M-16DE-D	CPX-8DE-8DA	CPX-4DA	CPX-8DA	CPX-8DA-H	CPX-2AE-U-I	CPX-2AA-U-I	CPX-4AE-I	CPX-4AE-U-I	CPX-4AE-P-B2	CPX-4AE-P-D10	CPX-4AE-T
Order code		E	F	D	O	M	NM	Y	A	L	NL	U	P	I	NI	NV	NY	T
Part no.		195 750	195 752	541 480	543 813	543 815	550 202	526 257	195 754	541 482	550 204	526 168	526 170	541484	573 710	560 361	560 362	541 486
Number of inputs		8	4	8	8	16	16	8	–	–	–	2	–	4	4	4	4	–
No. of outputs		–	–	–	–	–	–	8	4	8	8	–	2	–	–	–	–	4
Switching logic/resolution		PNP	PNP	PNP	NPN	PNP	PNP	PNP	PNP	PNP	PNP	12 bits + 0-10 V, 0-20 mA, 4-20 mA	12 bits + 0-10 V, 0-20 mA, 4-20 mA	12 bits + 0-20 mA, 4-20 mA	15 bits + 0-10 V, 0-20 mA, 4-20 mA, ±10 V, ±20 mA, ±5 V	10 bits	10 bits	12 bits
Signal range		–	–	–	–	–	–	–	–	–	–	–	–	–	–	0...10 bar	0...10 bar	Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni500, Ni1000, 2-, 3- or 4-wire technology
Max. current supply per channel		0,5 A	0,5 A	0,5 A	0,5 A	0,5 A	0,5 A	0,5 A	1 A	0,5 A	2,1 A	0,7 A	2,8 A	0,7 A	0,7 A	–	–	–

Type		CPX-4AE-TC	CPX-L-16DE-16-KL-3POL	CPX-L-8DE-8DA-16-KL-3POL	CPX-FVDA-P2	CPX-P-8-DE-N	CPX-P-8-DE-N-IS	CPX-2-2E20A
Order code		N1	NB	NC	NG	ER	EW	T25
Part no.		553 594	172 606	572 607	1 971 599	565 933	565 934	576 046
Number of inputs		16	8	3	8	8	8	2 high-speed inputs
No. of outputs		–	–	–	–	–	–	2 high-speed outputs
Switching logic/resolution		12 bits	PNP	PNP	PROFIsafe	NAMUR	NAMUR	PNP/PWM
Signal range		Type B, E, J, K, N, R, S, T, 2-wire technology	–	–	–	–	Intrinsically safe	Inputs up to 100 kHz/1 MHz at 24 V/5 V, outputs up to 20 kHz (PWM), controller for 24 V DC motor
Max. current supply per channel		–	0,25 A	0,25 A	1,5 A	–	–	–

Safety@Festo: VTSA protects!

An important application of VTSA is in safety pneumatics.

Machine manufacturers have a high demand for VTSA with safety functions, particularly two-channel VTSA valve blocks to simplify previously separate valve installations.

1. Protection against unexpected start-up, as per EN 1037
2. Reversing of the cylinder movement

Additional protective measures:
Appropriate protection for workers in hazard zones, e.g.

when inserting objects in a manual workstation. Other applications require special emergency-off characteristics.

- Manual clamping devices: switching to unpowered with self-locking loop
- Lifting/rotary cylinders: stopping, holding, blocking a movement
- Soft start valve with quick exhaust up to max. PL e according to EN 13849-1
- Switchable pilot air: protection against unexpected restart of a system up to max. PL d in accordance with EN 13849-1
- Optional non-return valves, which are also activated by the pilot air valve, make a a two-channel pneumatic stop function possible.

Associated products:

- Control block VOFA with safety function
- Soft-start valve
- Pilot air switching valve
- Isolation of electrical zones

Modular system number

Type	Order code	Part no.	Designation
VTSA-FB	44P	539 217	Valve terminal VTSA with fieldbus
VTSA-MP	44P	539 215	Valve terminal VTSA with multi-pin
VTSA-AS1	44P	555 564	Valve terminal VTSA with AS-Interface
VTSA-F-FB	45P	547 965	Valve terminal VTSA-F, high flow rate, with fieldbus
VTSA-F-MP	45P	547 963	Valve terminal VTSA-F, high flow rate, with multi-pin
CPX	50E	197 330	Modular electrical terminal CPX (without valve terminal)
	51E		Modular electrical terminal CPX with metal interlinking
	53E		Modular electrical terminal CPX for control cabinet construction, IP20
	54E		Modular electrical terminal CPX, intrinsically safe IS modules are possible

Fieldbus plug connectors

Type		FBS-SUB-9-GS-DP-B	FBA-2-M12-5POL-RK	CPX-AB-2-M12-RK-DP	FBS-SUB-9-BU-IB-B	FBS-SUB-9-GS-IB-B	CPX-AB-2-M12-RK-IB	FBS-SUB-9-BU-2x5POL-B	FBA-2-M12-5POL	FBSD-GD-9-5POL	FBS-M12-5GS-PG9	FBA-1-SL-5POL	FBSD-KL-2x5POL	FBS-SUB-9-GS-2x4POL-B	FBA-1-SL-5POL
Order code		GD	–	GD	–	GD	–	GD	GA	–	–	GB	–	GB	–
Part no.		532 216	533 118	541 519	532 218	532 217	534 505	532 219	525 632	18 324	175 380	525 634	525 635	532 220	197 962
Designation		Fieldbus plug, Sub-D, IP65/IP67, 9-pin, pin	Fieldbus connection, 2x M12, B-coded	Fieldbus connection, 2x M12, B-coded	Fieldbus plug, Sub-D, IP65/IP67, 9-pin, socket	Fieldbus plug, Sub-D, IP65/IP67, 9-pin, pin	Fieldbus connection, 2x M12, B-coded	Fieldbus plug, Sub-D, IP65/IP67, 9-pin, socket	Fieldbus connection, 2x M12, A-coded	Fieldbus socket, M12, 5-pin, socket, A-coded, incoming	Fieldbus plug, M12, 5-pin, pin, A-coded, outgoing	Fieldbus connection, 5-pin, pin strip	Terminal strip, screw connection (open style)	Fieldbus plug, Sub-D, IP65/IP67, 9-pin, pin	Fieldbus connection, screw terminal strip

Plug connectors/software technology modules

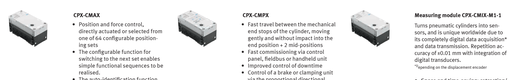
Type		FBS-SUB-9-GS-1x9POL-B	FBS-RJ45-8-GS	NECU-M-S-B12G5-C2-PB	NECU-M-B12G5-C2-PB	CACR-S-B12G5-2-20-PB	NECU-M-S-D12G4-C2-ET	FBS-RJ45-PP-GS	FBS-SCRJ-PP-GS	CPX-M-AK-C
Order code		–	GH	GA	GB	GC	GZ	GI	GK	BC
Part no.		534497	534 494	106 635 4	106 790 5	107 212 8	543 109	552 000	571 017	548 753
Designation		Fieldbus plug, Sub-D, IP65/IP67, 9-pin, pin	Ethernet plug, RJ45, IP65/IP67, 8-pin	Straight plug, M12x5, 5-pin, B-coded, screened	Straight socket, incoming, M12x5, 5-pin, B-coded, screened	Terminating resistor	Straight plug/screw terminal M12x5, 4-pin, screened, D-coded Industrial Ethernet	Plug, RJ45 (Ethernet, push-pull)	Plug, fibre-optic cable (Ethernet, push-pull)	Cover cap for push-pull

CPX-CEC/CPX-FEC

Motion control technology modules for electric drives and servopneumatics

Type		CPX-CEC-C1	CPX-CEC-M1	CPX-CMXX	CPX-CM-HPP
Order code		T07	T08	T20	T31
Part no.		567 367	567 368	555 667	562 214
Fieldbus protocol		CODESYS	CODESYS Softmotion 2.5D	FHPP-Max	FHPP
Description		CANopen master for connecting additional field devices	CANopen master for connecting additional field devices		

Decentralised installation system CPI



Type	CPX-CP-4-FB
Order code	T11 to T18
Part no.	526 705
No. of CP strings	16
String length	Max. 10 m
No. of CP modules per string	• Up to 4 strings with up to 4 modules each and up to 32 I/Os per string • Power supply and bus interface via the same cable

CP interface for decentralised installation systems, thus optimising the pneumatic control chains (short tubes/short cycle times)

Installation system CTEL

Type	CPX-CTEL-4-M12-5POL
Order code	T40 to T44
Part no.	1 577 012
Number of connections	4
Cable length	Max. 20 m
Number of modules per connection	• One I-port module per connection

The CPX-CTEL master from Festo enables modules with an I-port interface to be connected to a CPX system, such as a valve terminal or an I/O module.

CPX-CMAX

- Position and force control, directly actuated or selected from one of six configurable positioning sets
- The configurable function for switching to the next set enables simple functional sequences to be realised.
- The auto-identification function identifies each station with its device data on the controller.
- Control of a brake or clamping unit via the proportional directional control valve VPWP

Type	CPX-CMAX-C1-1		
Order code	T21		
Part no.	548 932		
Moving masses	Horizontal	1...300 kg	
	Vertical	1...100 kg	
Regulated force at 6 bar	30...2700 N		
Positioning accuracy	±0.2 mm		
Travel speed	Max. 3 m/s		
Acceleration	Max. 30 m/s²		

CPX-CMPX

- Fast travel between the mechanical end stops of the cylinder, moving gently and without impact into the end position + 2 mid-positions
- Fast commissioning via control panel, fieldbus or handheld unit
- Improved control of downtime
- Control of a brake or clamping unit via the proportional directional control valve VPWP
- All system data can be read and written via the fieldbus, including the mid-positions, for example.

Type	CPX-CMPX-C-1-H1		
Order code	T20		
Part no.	548 931		
Moving masses	Horizontal	1...300 kg	
	Vertical	1...100 kg	
Mid-positions	Up to two freely programmable mid-positions, including via the fieldbus		
Positioning accuracy	Accuracy ± 0.25% of the displacement encoder length, but at least ± 2 mm		
Fast, vibration-free travel between 2 fixed stops			

Measuring module CPX-CMIX-M1-1

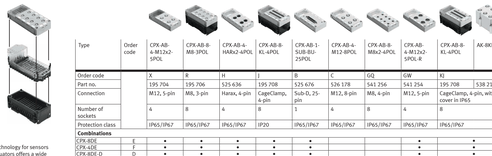
Turns pneumatic cylinders into sensors, and is unique worldwide due to its completely digital data acquisition and data transmission. Repetition accuracy of ±0.01 mm with integration of digital transducers.

[1] Depending on the displacement encoder

- Space and time-saving: retracting/advancing and measuring in one step
- Reduced cycle time: stroke-dependent triggering of downstream process steps
- Improved quality: process steps are measured and documented
- Faster and more reliable commissioning thanks to harmonised system

Type	CPX-CMPX-M1-1
Order code	T23
Part no.	567 417
Repetition accuracy	DGCI and DNCI: ±0.01 mm Stroke-dependent potentiometer <360 mm = ±0.01 mm; >360 mm = ±0.06 mm
Max. cable length between the controller and the drive: 30 m	

Extremely flexible connections



Manifold block

Electronic module

Interlinking block

Type	Order code	CPX-AB-4-M12x2-5POL	CPX-AB-8-M8-3POL	CPX-AB-4-HARx2-4POL	CPX-AB-8-KL-4POL	CPX-AB-1-SUB-BU-25POL	CPX-AB-4-M12-8POL	CPX-AB-8-M8x2-4POL	CPX-AB-4-M12x2-5POL-R	CPX-AB-8-KL-4POL	AK-8KL	CPX-AB-4-M12x2-5POL	CPX-AB-5-4-M12	CPX-M-4-M12x2-5POL	CPX-M-8-M12x2-5POL	CPX-P-AB-2xKL-8POL	CPX-P-AB-2xKL-8POL-BDE N-IS	CPX-P-AB-4xM12-4POL-BDE N-IS
Order code		X	R	H	J	B	C	GQ	GW	KJ		W		KA	KB	EGR	EKR	EGW
Part no.		195 704	195 706	525 636	195 708	525 676	526 178	541 256	541 254	195 708	538 219	195 704	526 184	549 367	549 335	565 704	565 706	565 703
Connection		M12, 5-pin	M8, 3-pin	Harax, 4-pin	CageClamp, 4-pin	Sub-D, 25-pin	M12, 8-pin	M8, 4-pin	M12, 5-pin	CageClamp, 4-pin, with M12, 5-pin		M12, 5-pin		M12, 5-pin	M12, 5-pin	Terminal	M12, 4-pin	Terminal
Number of sockets		4	8	4	8	1	4	8	8	4	8	4		4	8	8	4	8
Protection class		IP65/IP67	IP65/IP67	IP65/IP67	IP20	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67	IP65/IP67		IP65/IP67		IP65/IP67	IP65/IP67	IP65/IP67	IP20	IP65/IP67
Combinations																		
CPX-8DE	E	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-4DE	F	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-8DE-D	D	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-8NDE	O	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-16DE	M	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-M-16DE-D	NM	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-8DE-8DA	Y	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-4DA	A	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-8DA	L	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-8DA-H	NL	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-2AE-U-I	U	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-2AA-U-I	P	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-4AE-I	I	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-4AE-U-I	NI	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-4AE-T	T	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-4AE-TC	N1	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-L-16DE-16-KL-3POL	NB	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-L-8DE-8DA-16-KL-3POL	NC	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-FVDA-P2	NG	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-P-8-DE-N	ER	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-P-8-DE-N-IS	EW	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•
CPX-2-2E20A	T25	•	•	•	•	•	•	•	•	•		•		•	•	•	•	•

The connection technology for sensors and additional actuators offers a wide range of digital and analogue input and output modules and is freely selectable – as appropriate to your standard or application. Plastic or metal connection blocks can be combined as required:

Metal version

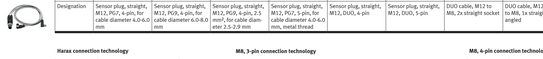
- M12-5POL

Plastic version:

- M12-5POL, M12-5POL with screw-type lock and metal thread, M12-8POL, M8-3POL, M8-4POL, Sub-D, Harax®, CageClamp® (with cover, also for IP65/67)

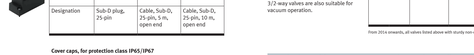
Plug connectors for inputs and outputs

Connection technology M12



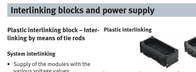
Type	SEA-GS-7	SEA-GS-9	SEA-4GS-7-2,5	SEA-M12-5GS-PG7	SEA-GS-11-DUO	SEA-5GS-11-DUO	KM12-DUO-M8-GDGD	KM12-DUO-M8-GDWD	KM12-DUO-M8-WDWD
Order code	S	T	–	W	P	X	K	–	–
Part no.	18 666	18 778	197 060	175 487	18 779	192 010	18 685	18 688	18 687
Designation	Sensor plug, straight, M12, PG7, 4-pin, for cable diameter 4.0-6.0 mm	Sensor plug, straight, M12, PG9, 4-pin, for cable diameter 6.0-8.0 mm	Sensor plug, straight, M12, PG9, 4-pin, for 2,5 mm², for cable diameter 2.5-2.9 mm	Sensor plug, straight, M12, PG7, 5-pin, for cable diameter 4.0-6.0 mm, metal thread	Sensor plug, straight, M12, DUO, 5-pin	Sensor plug, straight, M12, DUO, 5-pin	DUO cable, M12 to M8, 2x straight socket	DUO cable, M12 to M8, 2x straight/angled	DUO cable, M12 to M8, 2x angled socket

Sub-D connection technology



Type	SSub-D-D-S725	SSub-D-D-S725-SM	SSub-D-D-S725-10M
Order code	E	–	–
Part no.	527 522	543 473	543 474
Designation	Sub-D plug, 25-pin	Cable, Sub-D, 25-pin, 5 m, open end	Cable, Sub-D, 25-pin, 10 m, open end

Harax connection technology



Type	SEA-GS-HAR-4pol
Order code	A
Part no.	525 928
Designation	Harax sensor plug, 4-pin

M8, 3-pin connection technology

Type	SEA-3GS-M8-S	SEA-GS-M8
Order code	–	B
Part no.	192 009	18 696
Designation	Straight sensor plug, M8, screw-in	Straight sensor plug, M8, solderable

M8, 4-pin connection technology

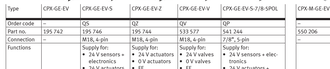
Type	NECU-S-M8G4-C2
Order code	GD
Part no.	106 8198
Designation	Sensor plug, straight, M8, 4-pin

Cover caps, for protection class IP65/IP67

Type	ISK-M8	ISK-M12
Order code	BA	BA
Part no.	177 672	165 592
Designation	Cover caps for M8	Cover caps for M12

Interlinking blocks and power supply

Plastic interlinking block – Inter-linking by means of tie rods



System interlinking

- Supply of the modules with the various voltage values
- Serial communication between the modules

System supply

- M18, 4-pin
- 7/8 inches, 4- or 5-pin

In addition to system interlinking, power supply for the

- Electronic modules plus sensors (16 A)
- Valves plus actuators (16 A)

Additional power supply

- In addition to system interlinking, power supply for the actuators (16 A per supply)
- Power supply for the valves (16 A per supply)

Expandability

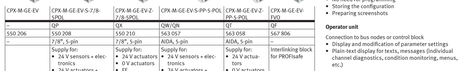
- Can be expanded using an interlinking block with tie rod CPX-2A-1-E

Type	CPX-GE-EV	CPX-GE-EV-S	CPX-GE-EV-Z	CPX-GE-EV-V	CPX-GE-EV-S-7/8-5POL
Order code	–	QS	QZ	QV	QP
Part no.	195 742	195 746	195 744	533 577	541 244
Connection	–	M18, 4-pin	M18, 4-pin	M18, 4-pin	7/8", 5-pin
Functions		Supply for: • 24 V sensors + electronics • 24 V actuators + valves • 0 V common • FE	Supply for: • 24 V actuators • 0 V actuators • FE	Supply for: • 24 V valves • 0 V valves • FE	Supply for: • 24 V sensors + electronics • 24 V actuators + valves • 0 V sensors + electronics • 0 V actuators + valves • FE

Plug connectors, power supply

Type	NTSD-GD-9	NTSD-GD-13,5	NTSD-WD-9	NTSD-WD-11	NECU-G78S-C2	NEBU-G78-WS-K-2-N-LE5	NECU-S7G7-C1	NECU-M-PN5-C1
Order code	N	M	J	J	GS	GG	QE	GN
Part no.	18 493	18 526	18 527	533 119	543 107	573 855	576 319	563 059
Connection	M18, 4-pin	M18, 4-pin	M18, 4-pin	M18, 4-pin	M18, 4-pin	M18, 4-pin	Terminal strip	Sub-D, 9-pin
Designation	Power supply socket, straight, IP65, 4x 1,5 mm²	Power supply socket, straight, IP65, 4x 2,5 mm²	Power supply socket, angled, IP65, 4x 1,5 mm²	Power supply socket, angled, IP65, 4x 2,5 mm²	Power supply socket, angled, IP65, 4x 0,34 mm²	Power supply socket, angled, 2-m cable	Terminal strip for system supply, IP20	Power supply socket, straight

Individual interlinking, screwed in



Type	CPX-ME-EV	CPX-ME-GE-EV-S-7/8-5POL	CPX-ME-GE-EV-Z-7/8-5POL	CPX-ME-GE-EV-S-PP-5POL	CPX-ME-GE-EV-Z-PP-5POL	CPX-ME-GE-EV-PP-5POL
Order code	–	QP	QZ	QW/QN	QT	QZ
Part no.	550 206	550 208	550 210	563 057	563 058	567 806
Connection	–	7/8", 5-pin	7/8", 5-pin	AIDA, 5-pin	AIDA, 5-pin	–
Functions		Supply for: • 24 V sensors + electronics • 24 V actuators + valves • 0 V sensors + electronics • 0 V actuators + valves • FE	Supply for: • 24 V actuators • 0 V actuators • FE	Supply for: • 24 V sensors + electronics • 24 V actuators + valves • 0 V sensors + electronics • 0 V actuators + valves • FE	Supply for: • 24 V actuators • 0 V actuators • FE	Interlinking block for PROFIsafe

Optional supply / QN, voltage tap for subsequent valve terminals

Diagnostics (display on PC)

Diagnostic interface adapter for laptops/portable devices with USB interface and installed FMT software

- Fault location and type
- No need for programming
- Storing the configuration
- Preparing screenshots

Operator unit

Connection to bus nodes or control block

- Display and modification of parameter settings
- Plain-text display for texts, messages (individual channel diagnostics, condition monitoring, menus, etc.)

Designation	Type	Part no.
Provides data polling, configuration and diagnostic functions for CPX terminals	CPX-MMI	529 043
Connecting cable M12-M12, specially for CPX-MMI	1,5 m	529 044
	3,5 m	530 901
CPX Maintenance Tool (CPX-FMT), software and USB-to-M12 adapter	NEFC-M12G5-0.3-U1G5	547 432

Note

With the A, B and AB pressure regulators VABF-S-...-1-..., the control pressure should not be under 2 bar. Use the reversible A, B or AB pressure regulators for control pressures under 2 bar.

Please note for repeat orders: Certain equipment versions of pressure regulator plates can only be ordered using the part numbers. In these cases, the part number on the regulator plate that is mounted on the VTSA/VTSA-F valve terminal will not match the design version. The VABF configurator should therefore always be used for repeat orders.

Benefits

- Higher exhaust rate, because regulation occurs upstream of the valve.
- The pressure regulator can always be adjusted, since the pressure from the valve terminal is always present.
- Increased service life, because compressed air is always present at the pressure regulator.
- Compressed air can be saved due to the different pressures for the advance and return strokes.

Application examples

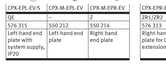
- An equal working pressure is required at working ports 2 and 4
- A working pressure (e.g. 3 bar) lower than the operating pressure present at the valve terminal (e.g. 8 bar) is required.

End plates, tie rods and accessories

End plates for plastic interlinking

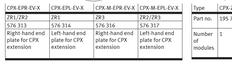
Type	CPX-EPL-EV	CPX-EPR-EV	CPX-EPFE-EV
Order code	–	–	–
Part no.	195 716	195 714	538 892
Designation	Left-hand end plate	Right-hand end plate	Earthing element

End plates for metal interlinking



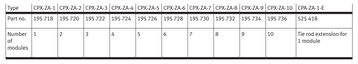
Type	CPX-EPL-EV-S	CPX-M-EPL-EV	CPX-M-EPR-EV
Order code	–	–	–
Part no.	576 315	550 212	550 214
Designation	Left-hand end plate with system supply, IP20	Left-hand end plate	Right-hand end plate

CPX extension



Type	CPX-EPR-EV-S	CPX-EPL-EV-S	CPX-M-EPR-EV-S	CPX-M-EPL-EV-S
Order code	–	–	–	–
Part no.	576 313	576 314	576 316	576 317
Designation	Right-hand end plate for CPX extension	Left-hand end plate for CPX extension	Right-hand end plate for CPX extension	Left-hand end plate for CPX extension

Tie rods



Type	CPX-2A-1	CPX-2A-2	CPX-2A-3	CPX-2A-4	CPX-2A-5	CPX-2A-6	CPX-2A-7	CPX-2A-8	CPX-2A-9	CPX-2A-10	CPX-2A-1-E
Order code	–	–	–	–	–	–	–	–	–	–	–
Part no.	195 718	195 726	195 722	195 724	195 728	195 730	195 732	195 734	195 736	525 418	
Number of modules	1	2	3	4	5	6	7	8	9	10	Tie rod extension for 1 module

Connecting cables for CPX extension

	NEBC-F12G8-KH-0-25-N-S-F12G8	NEBC-F12G8-KH-0-5-N-S-F12G8	NEBC-F12G8-KH-1-N-S-F12G8	NEBC-F12G8-KH-1,5-N-S-F12G8	NEBC-F12G8-KH-2-N-S-F12G8	NEBC-F12G8-KH-3-N-S-F12G8
Order code	V11	V12	V13	V14	V15	V16
Part no.	564 189	564 190	564 191	564 192	576 015	576 636
Designation	Cable for CPX extension, 0,25 m	Cable for CPX extension, 0,5 m	Cable for CPX extension, 1 m	Cable for CPX extension, 1,5 m	Cable for CPX extension, 2 m	Cable for CPX extension, 3 m

Pneumatic interface for fieldbus and multi-pin plug connection or individual connection

Pneumatic interface

Type	Order code	Description	Part no.
VABA-S6-1-X1	–	For electrical terminal CPX in plastic design	543 416
VABA-S6-1-X2	–	For electrical terminal CPX in metal design	550 663

Multi-pin nodes

Type	Order code	Description	Part no.
VABE-S6-1LF-C-M1-S37	T	Terminal strip, 36-pin	543 412
VABE-S6-1LF-C-M1-S37	MP1	Sub-D plug, 37-pin	543 414
VABE-S6-1LF-C-M1-R19	MP4	Round plug, 19-pin	543 415

Control block with safety function

Type	Order code	Valve function	Switching output	Part no.
VOFA-B26-T52-M-1C1-APP	SP	5/2-way solenoid valve, single solenoid, mechanical spring return, with switching position sensing via inductive sensor and 3-pin sensor push-in connector M8, mounted on intermediate plate for pneumatic interlinking	PNP	...[1]
VOFA-B26-T52-M-1C1-ANP	SN		NPN	...[1]

[1] The control block with safety function can only be ordered via the valve terminal configurator and therefore does not have a separate part number.

Cover for multi-pin plug

Type			Part no.
NECV-S1W37	–	For user configuration	545 974

Manifold sub-base VTSA, port pattern to ISO 15407-2 and ISO 5599-2

| Type | | VABV-S4-25-G1B-2T2 | VABV-S4-15-G1A-2T2 | VABV-S2-15-G1B-T2 | VABV-S