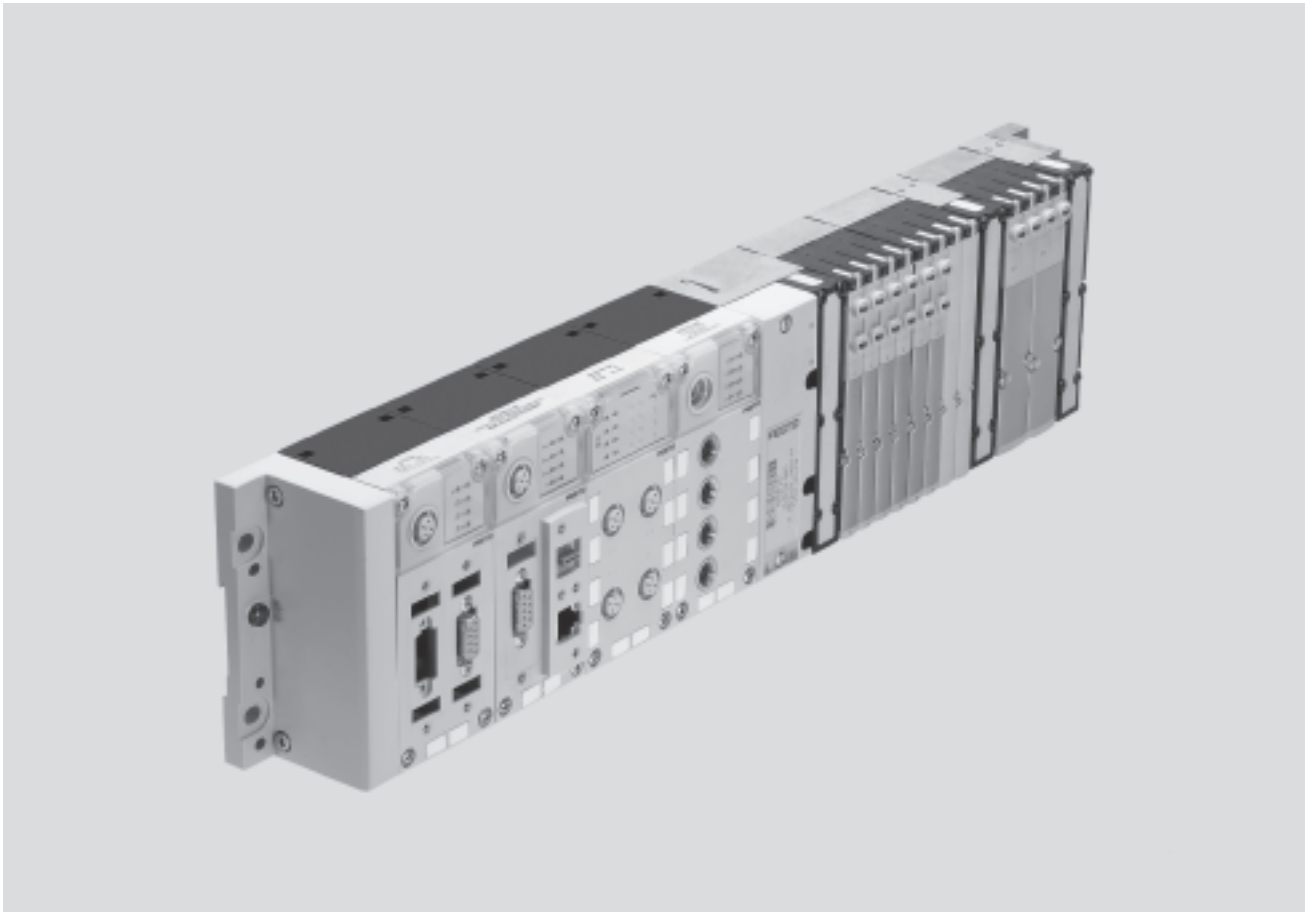
- Modular, flexible and sturdy terminal up to 512 I/Os
- Selectable connection technology
- Open to all fieldbus protocols and Ethernet
- Integrated diagnostic and service function
- Integrated IT services
- Suitable for MPA, CPA, MIDI/MAXI, VTSA/ISO
- CPX as a dedicated remote I/O module

Terminal CPX

Features



Features

Installation concept

- Choice of multiple valve terminal types for different applications:
  - Type 03 MIDI/MAXI
  - Type 12 CPA
  - Type 32 MPA
  - Type 44 VTSA
- Economical from the smallest configuration level right up to the maximum number of modules
- Up to 9 electrical input/output modules plus bus nodes and pneumatic interface/electronic modules for valves
- Extensive range of functions and connection options for the electrical modules
- Selectable connection technology for technically and economically optimised connections (M8, M12, Sub-D, Cage Clamp)
- Can be used as a dedicated remote I/O module

Electrical components

- High operating voltage tolerance (±25%)
- Choice of M18 or 7/8" connection for power supply
- Open to all fieldbus protocols and Ethernet
- Optional function and technology modules for pre-processing
- IT services and TCP/IP such as as remote maintenance, remote diagnosis, web server, SMS and e-mail alert
- Digital inputs and outputs, 4-fold/8-fold
- Analogue digital inputs and outputs, 2-fold/4-fold
- Temperature inputs –200 ... +850°C
- Protection to IP65 and IP67

Assembly

- Wall or H-rail mounting
- Conversions/extensions are possible at any time
- Modular system offering a range of configuration options
- Fully assembled and tested unit
- Lower costs for selection, ordering, assembly and commissioning
- Set-up of optimised control loops thanks to selectable pneumatics
- Central CPX terminal
- Decentralised, subordinate installation system CPI improves cycle times by up to 30%
- Optimised installation costs thanks to option of including centralised and decentralised I/O modules that are installed close to the machine

Operation

- Fast troubleshooting thanks to an extensive selection of LEDs (some of which are multi-coloured) on the bus node and on all I/O modules
- Suitable for direct machine mounting (IP65/IP67) or in the control cabinet with a terminal connection (IP20)
- Supports module- and channel-oriented diagnosis
- On the spot diagnosis in normal text via hand-held device
- Fieldbus/Ethernet remote diagnosis
- Innovative diagnostic support with integrated web server/web monitor
- Optimised commissioning thanks to parameterisable functions
- Reliability of service through the fast replacement of connection blocks and modules without changing the wiring

Terminal CPX

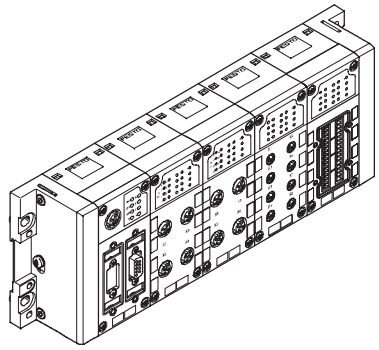
Features

Pneumatic variants of the CPX terminal

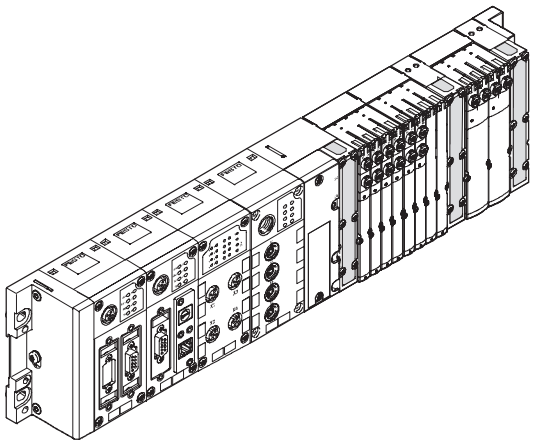
The electrical CPX terminal is a modular peripheral system for valve terminals.
The system is specifically designed so that the valve terminal can be adapted to suit different applications. The modular system design lets you configure the correct number of valves, inputs and additional outputs to suit the application.

The CPX terminal can also be used without a valve terminal as a remote I/O module.

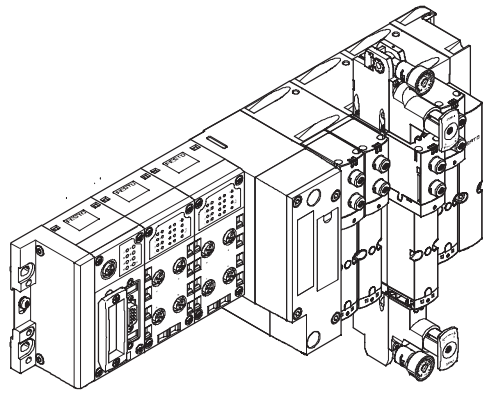
as a remote I/O module



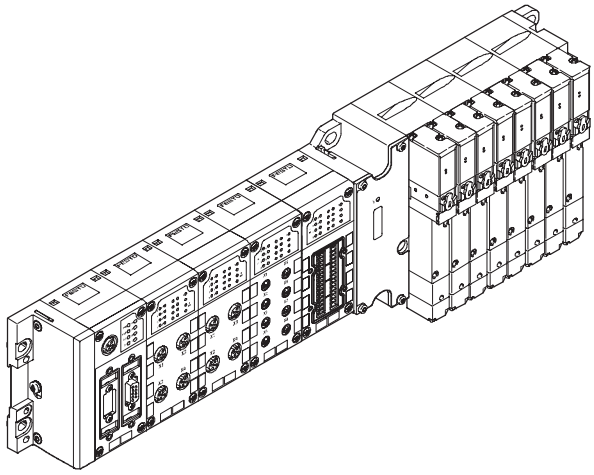
with valve terminal MPA



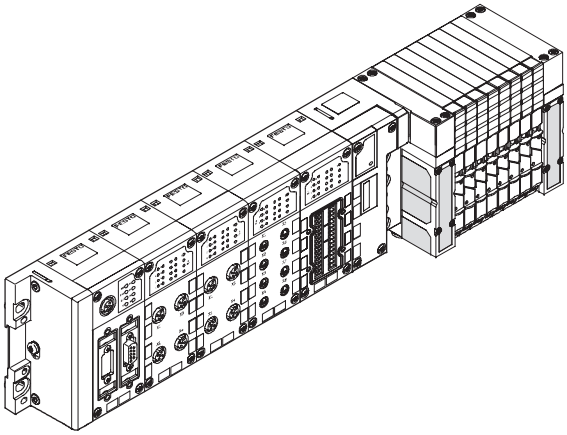
with valve terminal VTSA



with valve terminal MIDI/MAXI



with valve terminal CPA



Variants of the CPX terminal controller (without pre-processing)

Fieldbus node

Different bus nodes are used to integrate the terminal in the control systems of various manufacturers.
The CPX terminal can therefore be operated on over 90% of the most commonly used fieldbus systems and Industrial Ethernet.

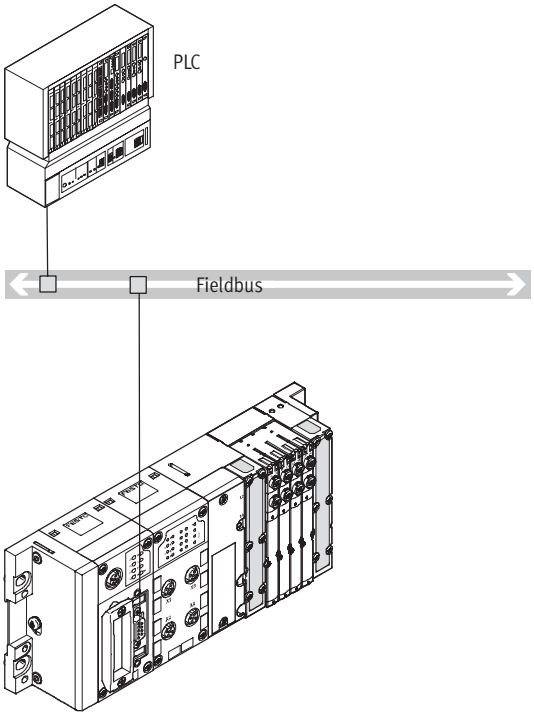
- Profibus-DP
- Interbus
- DeviceNet
- CANopen
- CC-Link
- Ethernet IP

Control block

The optional Front End Controller, CPX-FEC, permits simultaneous access via Ethernet and an integrated web server, as well as autonomous pre-processing.

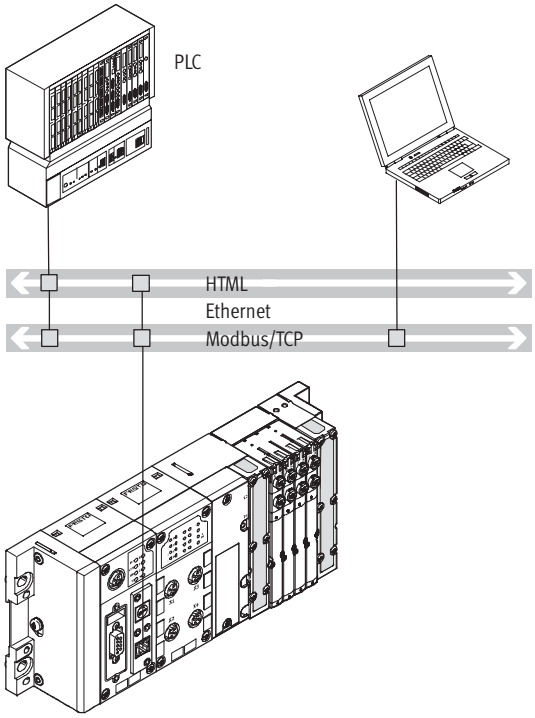
- Ethernet
- TCP/IP
- Web

with fieldbus node



- Communication with higher-order controller via fieldbus
- No pre-processing
- Fieldbus protocol dependent on CPX fieldbus node used
- Up to 512 I/Os, depending on the fieldbus node used

with FEC as remote I/O Modbus/TCP



- Connection to a higher-order controller directly via Modbus/TCP, no further fieldbus nodes are required
- Monitoring via Ethernet and web applications
- No pre-processing, direct actuation of the CPX peripherals by higher-order controller
- Up to 512 I/Os

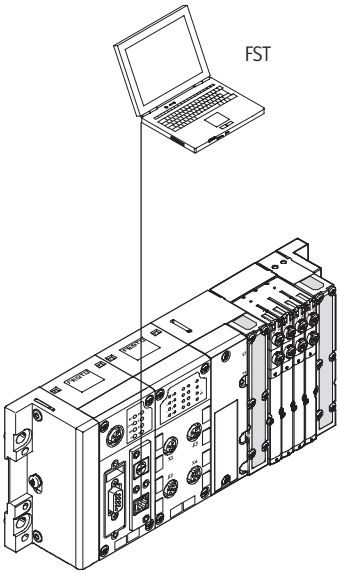
Note

Every electrical connection can be combined with an appropriate number of I/O modules and/or pneumatic components, depending on its address capacity.

Likewise every pneumatic variant of the CPX terminal can be operated with every electrical connection variant.

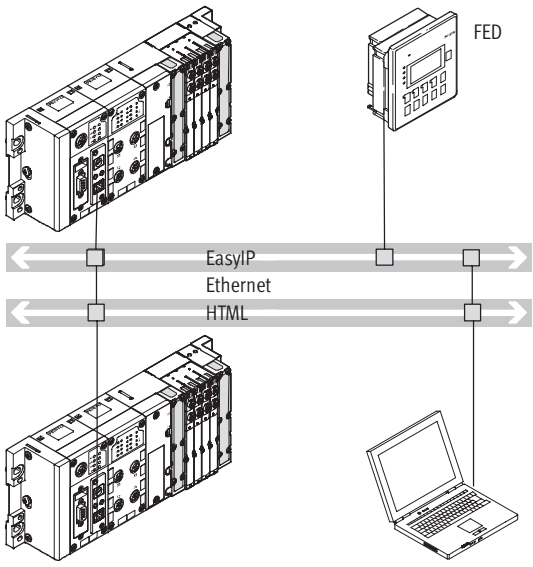
Variants of the CPX terminal controller (with pre-processing in the FEC)

with FEC in stand-alone mode



- Decentralised controller with direct machine mounting
- Interaction options via CPX-MMI or Front End Display (FED)
- Possibility of downloading programs via Ethernet (or via the programming interface)
- Commissioning, programming and diagnosis using the Festo software tool FST 4.1 with hardware configurator
- Supports full expansion of all CPX peripherals
- More than 300 I/Os

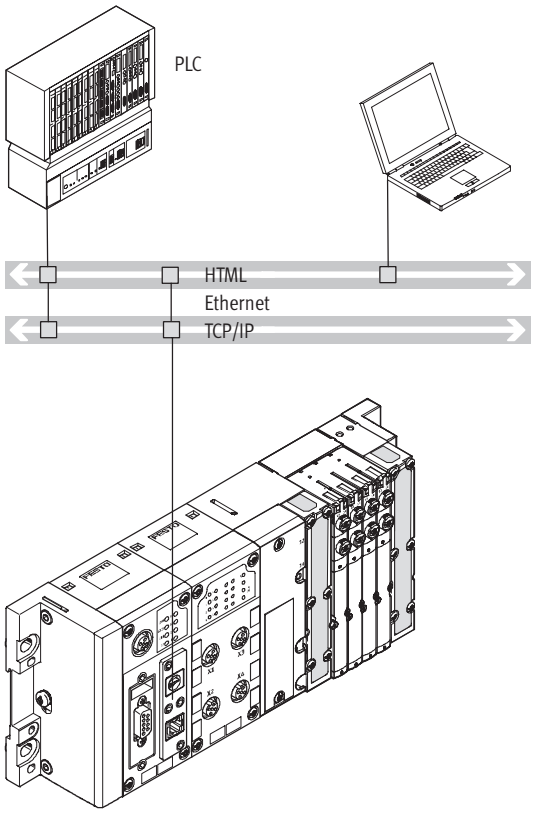
with FEC in Festo EasyIP mode



- Fast pre-processing of the CPX peripherals in the FEC
- Any data can be exchanged between the FEC via EasyIP
- Several FECs can be operated and monitored via one FED
- No higher-order controller is required
- More than 300 I/Os per CPX-FEC

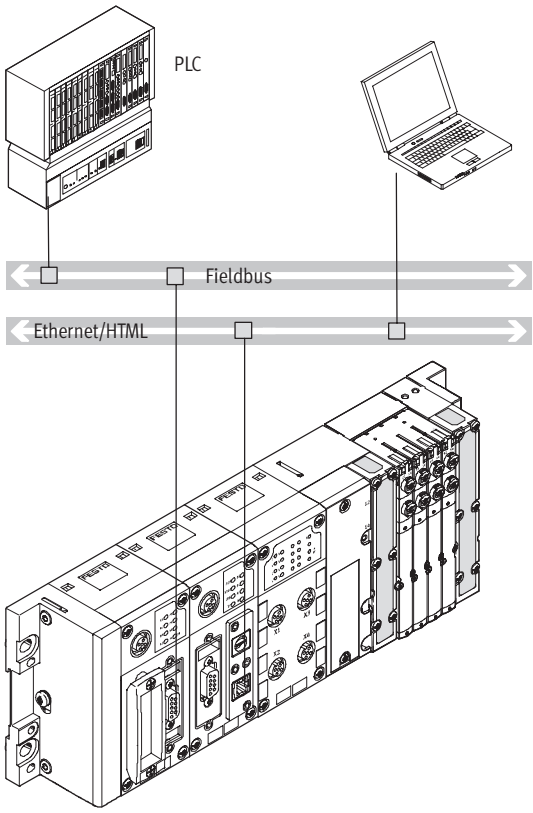
Variants of the CPX terminal controller (with pre-processing in the FEC)

with FEC as Ethernet remote controller



- Connection to a higher-order controller directly via Ethernet, no further fieldbus nodes are required
- Monitoring via Ethernet and web applications
- Pre-processing of the CPX peripherals through CPX-FEC

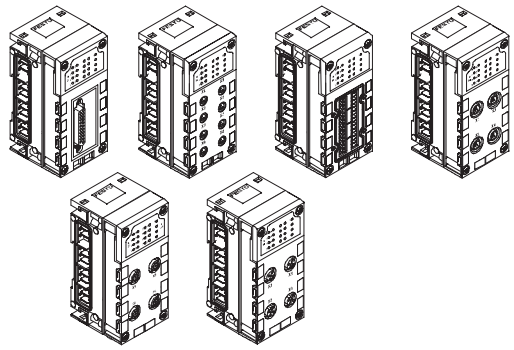
with FEC as fieldbus remote controller



- Fast pre-processing of the CPX peripherals in the FEC
- Communication with higher-order controller via fieldbus
- Optional additional monitoring via Ethernet and web applications
- Downloading of programs via programming interface
- More than 300 I/Os, fieldbus nodes are only used for communication with the higher-order PLC
- This combination also supports two fieldbus nodes for redundant communication configuration

Switching of inputs and outputs to the CPX terminal

Digital and analogue CPX I/O modules

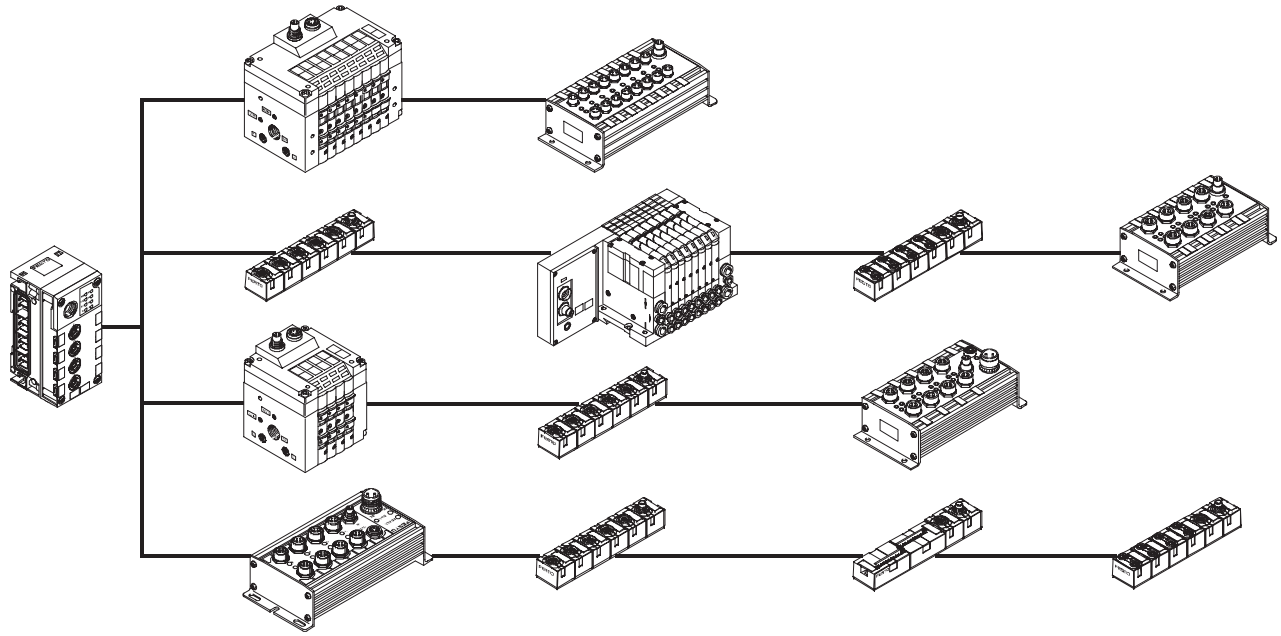


Electrical connection

The connection technology for the sensors and additional actuators offers a wide range of digital and analogue input and output modules and is freely selectable – depending on your standards or application:

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

with CPX CP interface

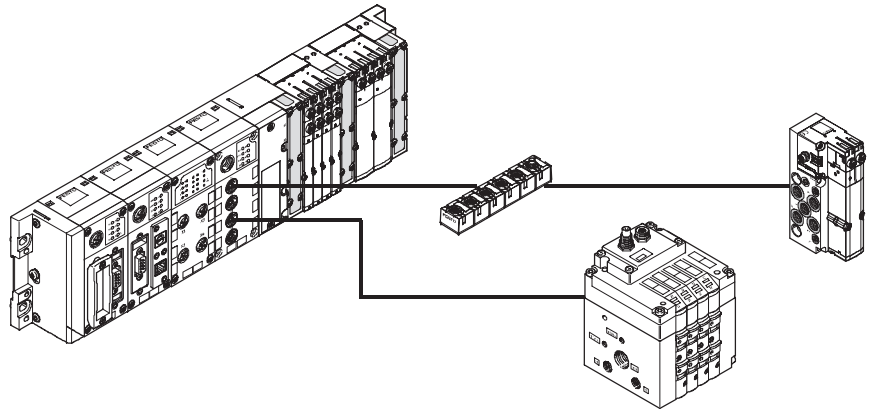


- Up to 4 strings per CP interface possible.
- Up to 4 subordinate CP modules can be combined in a string.
- Up to 32 I/Os can be connected per string.
- Modules with M8, M12 and terminal connection.

Several CP interface modules can be combined in one CPX terminal (depending on the controller used).

Combination of central CPX I/O modules and decentrally mounted I/O modules of the CPI installation system.

combined centralised and decentralised electrical connection (valve terminal with CP interface/output module)



- Scalable to different requirements within a system
- Control interface in the system, reduced installation effort for centralised and distributed actuators
- Optimised electrical and pneumatic control loop system achievable

Ordering

The CPX terminal with valve terminal is fully assembled according to order specifications and individually tested. The finished valve terminal consists of the electrical peripherals including the desired actuation and the selected components of the VTSA (ISO), CPA, MPA or MIDI/MAXI modules.

The CPX terminal with valve terminal is ordered using two separate order codes. One order code defines the electrical peripherals type CPX, while the other specifies the pneumatic components of the valve terminal.

The electrical peripherals type CPX can naturally also be configured without a valve terminal and can be used on a fieldbus. For this order, you only require the order code for the electrical peripherals.

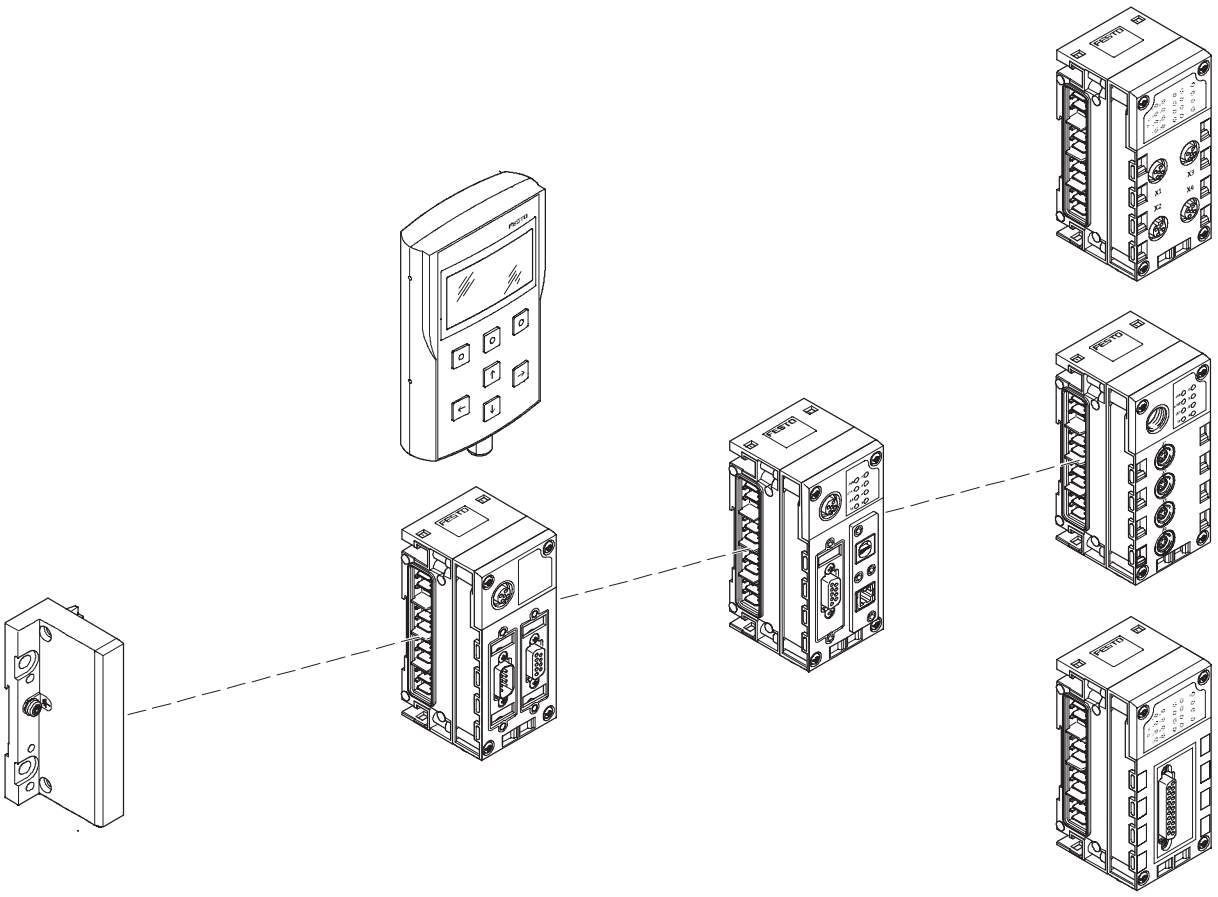
The order lists for the pneumatic components can be found in

- ➔ Valve terminal type 44 VTSA, ISO 15 407-2
- ➔ Valve terminal type 12 CPA, Compact Performance
  4 / 2.1-85
- ➔ Valve terminal type 32 MPA, Modular Performance
  4 / 2.2-1
- ➔ Valve terminal type 03 VIMP-/VIFB-03, multi-functional MIDI/MAXI
  4 / 2.2-54
  4 / 2.2-1

The order lists for the CP components can be found in

- ➔ Installation system CPI
  4 / 4.6-1

Complete overview of modules



End plate

- Mounting holes for wall mounting
- Functional earthing connection
- Special earthing plate for safe and easy connection to the machine bed or H-rail

Bus node

- Fieldbus/Industrial Ethernet connection using different connection technology
- Setting of fieldbus parameters via DIL switch
- Display of fieldbus and peripheral equipment status via LED

Display and control unit

- Connection to bus nodes or control block
- Display and modification of parameter settings
- Normal text display for texts, messages (e.g. individual channel diagnosis, condition monitoring), menus, etc.

Control block

- Pre-processing, autonomous controller or remote unit CPX-FEC
- Connection via Ethernet TCP/IP or Sub-D programming interface
- Setting of operating modes via DIL switch and program selection via rotary switch

Input/output modules

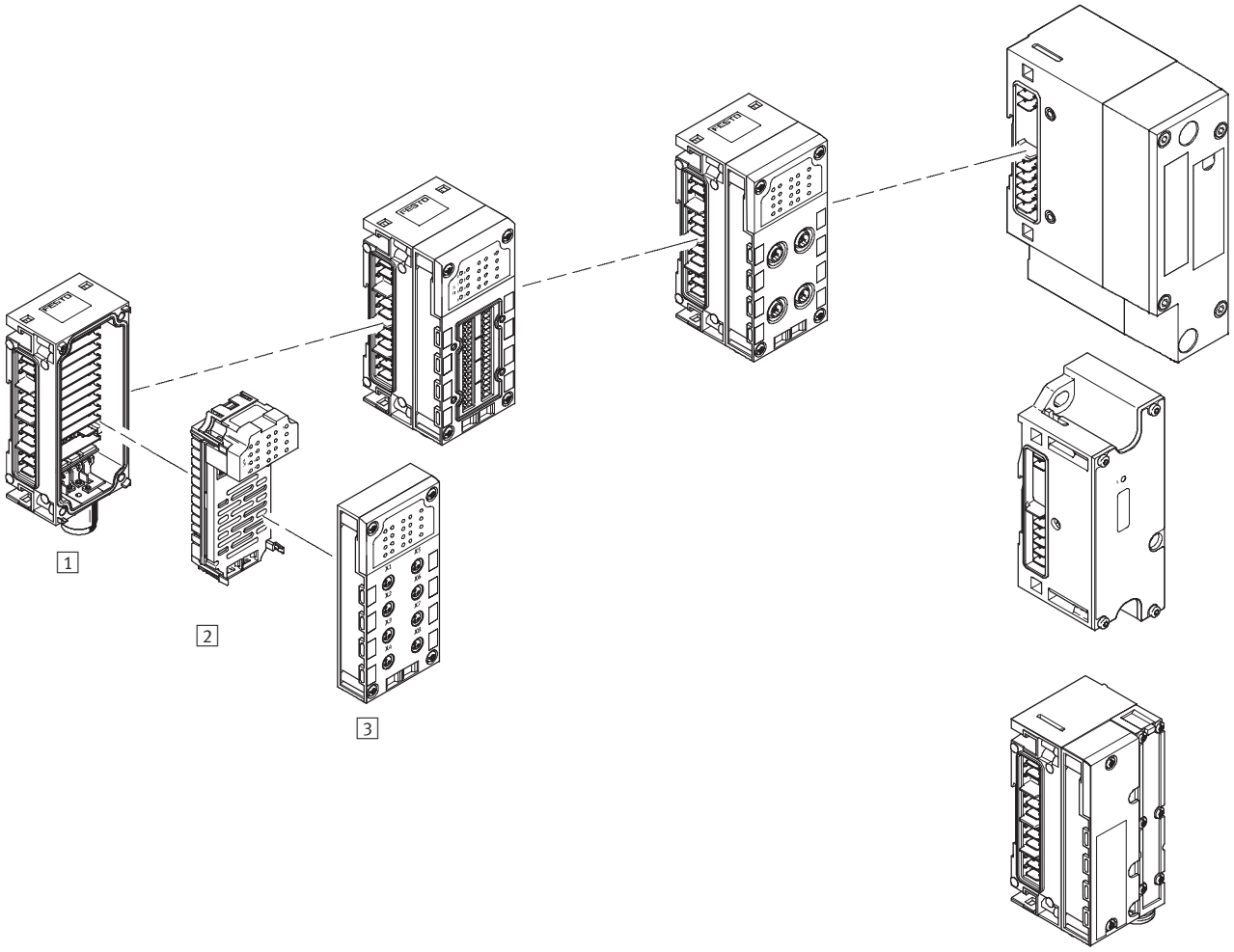
Combination of

- Interlinking block
- Electronics module
- Connection block

CP interface

- CP interface for decentralised installation systems, thus optimising the pneumatic control loop systems (short tubes/short cycle times)
- Up to 4 strings with up to 4 modules each and up to 32 I/Os in total per string
- Power supply and bus interface via the same line

Complete overview of modules



Input/output modules

1 Interlinking block

- Internal linking of the power supply and serial communication
- External power supply for the entire system
- Additional power supply for outputs or valves
- Choice of M18 or 7/8"

2 Electronics module

- Digital inputs for connecting the sensors
- Digital outputs for activation of additional actuators
- Analogue inputs
- Temperature inputs (analogue)
- Analogue outputs

3 Connection block

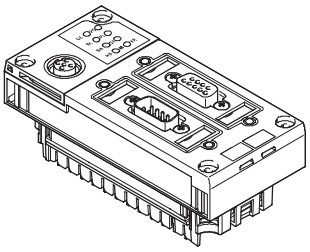
- Selectable connection technology with 8 variants
- Protection class IP65/IP67 or IP20
- Freely combinable with the electronics modules

Pneumatic interface

- Actuation of the solenoid coils
- MPA1/2
- VTSA (ISO)
- MIDI/MAXI
- CPA10/14

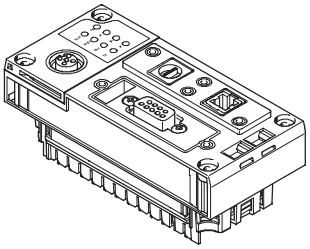
Individual overview of modules

Bus node



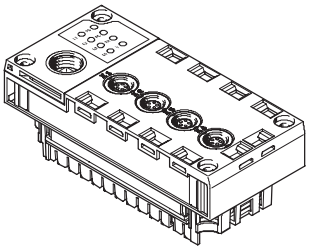
Bus node for
- Profibus-DP
- Interbus
- DeviceNet
- CANopen
- CC-Link

Control block



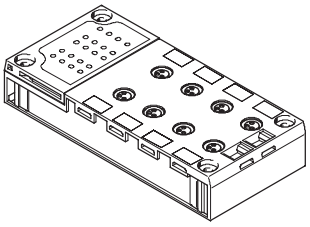
Control block
- Ethernet interface
- Integrated web server
- Sub-D programming interface

CP interface



CP interface
- 4 CP strings
- Max. 4 modules per string
- 32I/32O per string
- CPI functionality

Connection block

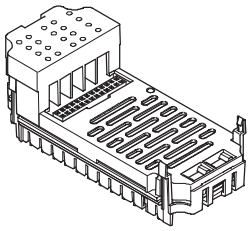


Direct machine mounting
(protection class IP65/IP67)
- M8-3Pin
- M8-4Pin
- M12-5Pin
- M12-5Pin Speedcon quick lock, metal thread screened
- M12-8Pin
- Sub-D
- Harax®
- Clamped terminal connection (CageClamp®) with cover

Protected fitting space
(protection class IP20)
- Clamped terminal connection (CageClamp®)

Individual overview of modules

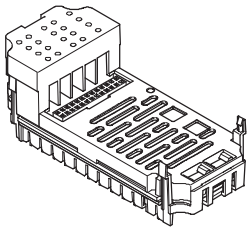
Digital electronics module for inputs/outputs



Digital inputs and outputs
- 4 digital inputs
- 8 digital inputs
- 8 digital inputs with individual channel diagnosis
- 4 digital outputs (1 A per channel, individual channel diagnosis)
- 8 digital outputs (0.5 A per channel, individual channel diagnosis)

Multi I/O modules
- 8 digital inputs and 8 digital outputs

Analogue electronics module for inputs/outputs

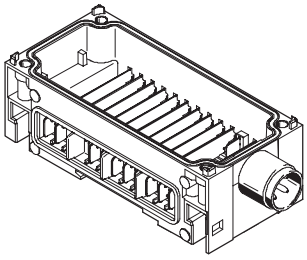


Analogue inputs
- 2 analogue inputs (0 ... 10 V DC, 0 ... 20 mA, 4 ... 20 mA)
- 4 analogue inputs (0 ... 20 mA, 4 ... 20 mA)

Analogue temperature inputs
- 4 analogue inputs for temperature measurement (Pt100, Pt200, Pt500, Pt1000, Ni100, Ni120, Ni500, Ni1000)

Analogue outputs
- 2 analogue outputs (0 ... 10 V DC, 0 ... 20 mA, 4 ... 20 mA)

Interlinking block



System linking
- Different voltage values for supplying the modules
- Serial communication between the modules

System supply
either M18 or 7/8"
In addition to system linking, power supply for the
- electronics plus sensors (16 A)
- valves plus actuators (16 A)

Additional power supply
In addition to system linking, power supply for the
- actuators (16 A per supply)

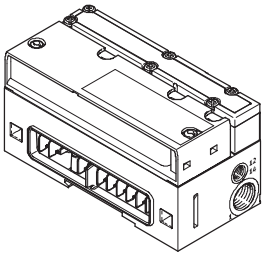
Power supply for the
- valves (16 A per supply)

Note

The max. current is limited to 12 A with the 7/8" system supply.
When using a conventional pre-assembled cable, the max. current is limited to 8 A.

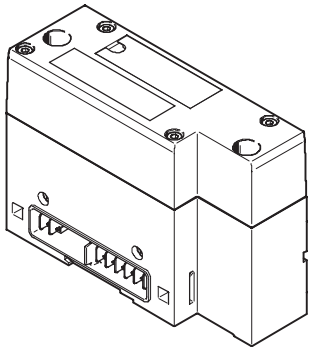
Individual overview of modules

Pneumatic interface MPA
➔ 4 / 4.8-94



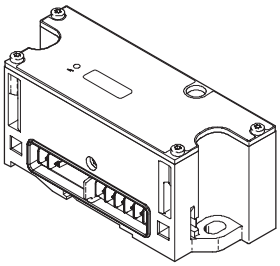
Valve terminal
- MPA1 (360 l/min)
- MPA2 (700 l/min)
- Up to 64 solenoid coils
- Up to 8 modules can be configured

Pneumatic interface VTSA
➔ 4 / 4.8-95



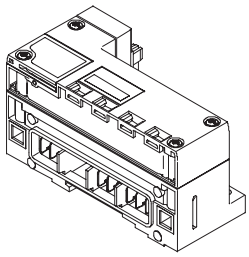
Valve terminal
- 18 mm (ISO 02): Valve flow rate up to 700 l/min
- 26 mm (ISO 01): Valve flow rate up to 1,400 l/min
- Max. 32 valve positions/max. 32 solenoid coils

Pneumatic interface MIDI/MAXI
➔ 4 / 4.8-96



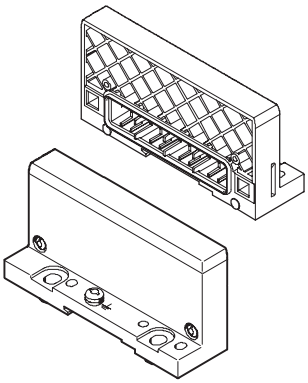
Valve terminal with
- MIDI valves (500 l/min) or/and MAXI valves (1,250 l/min)
- Up to 26 solenoid coils
- Setting of the number of valves via DIL switch

Pneumatic interface CPA
➔ 4 / 4.8-98



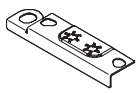
Valve terminal
- CPA10 (300 l/min)
- CPA14 (600 l/min)
- Up to 22 solenoid coils
- Setting of the number of valves via DIL switch

End plate



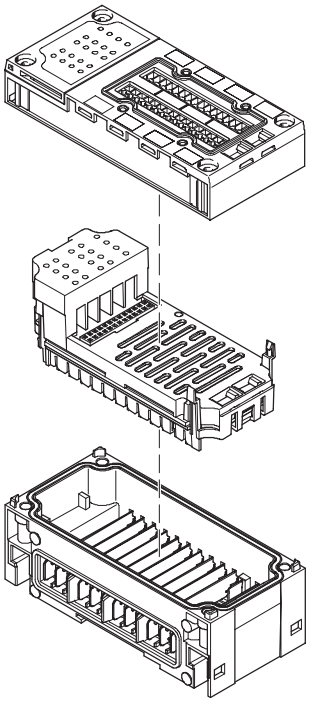
End plate
- Left
- Right (for use without valves)

Earthing plate



Earthing plate
- For safe and easy connection to the machine bed or H-rail, suitable for right-hand and left-hand end plate

General basic data and guidelines



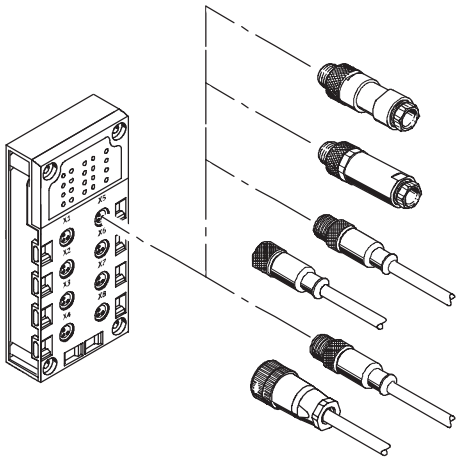
Max. 11 modules in total:
- One bus node and/or one control block, freely positionable
- Up to 9 further input/output modules, freely positionable
- An additional pneumatic interface, always positioned as the last module on the right-hand side
  - For VTSA, CPA and MIDI/MAXI: fixed operating range, set using DIL switch
  - For MPA: 16 MPA modules can be configured
- Address capacity max. 512 inputs and 512 outputs, depending on bus node or control block
- One interlinking block with system supply, freely positionable
- Multiple interlinking blocks with additional power supply, always positioned to the right of the interlinking block with system supply
- The connection blocks can, with just a small number of exceptions, be freely combined with the electronics modules for inputs/outputs (➔ table below)
- All electronics modules for inputs/outputs can be combined with any interlinking block

Combinations of connection blocks and electronics modules for inputs/outputs

Connection blocks	Electronics modules for inputs/outputs									
	CPX-4DE	CPX-8DE	CPX-8DE-D	CPX-4DA	CPX-8DA	CPX-8DE-8DA	CPX-2AE	CPX-4AE-I	CPX-4AE-T	CPX-2AA
CPX-AB-8-M8-3POL	■	■	■	■	■	–	–	–	–	–
CPX-AB-8-M8X2-4POL	–	–	–	■	■	–	–	–	–	–
CPX-AB-4-M12x2-5POL	■	■	■	■	■	–	■	■	■	■
CPX-AB-4-M12x2-5POL-R	■	■	■	■	■	–	■	■	■	■
CPX-AB-4-M12-8POL	–	–	–	–	–	■	–	–	–	–
CPX-AB-8-KL-4POL	■	■	■	■	■	■	■	■	■	■
CPX-AB-1-SUB-BU-25POL	■	■	■	■	■	■	■	■	–	■
CPX-AB-4-HARx2-4POL	■	■	■	■	■	–	–	–	■	–

Electrical connection – Connection block

CPX-AB-8-M8-3POL with 3-pin M8 (M8-3POL) connection, CPX-AB-8-M8X2-4POL with 4-pin M8 (M8-4POL) connection

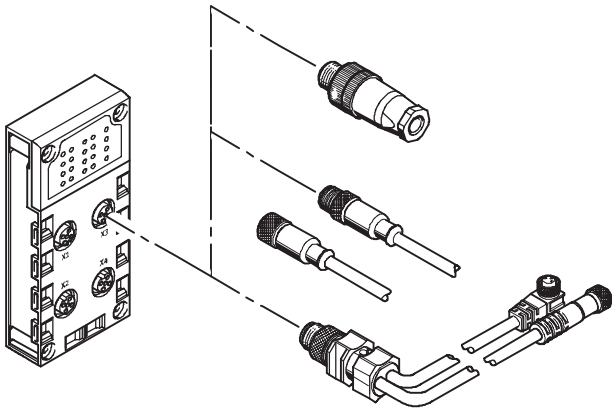


- Compact for pre-assembled individual connection
- 8 sockets
- 3-pin design for connection of 1 channel per socket
- 4-pin design for connection of 2 channels per socket

Note

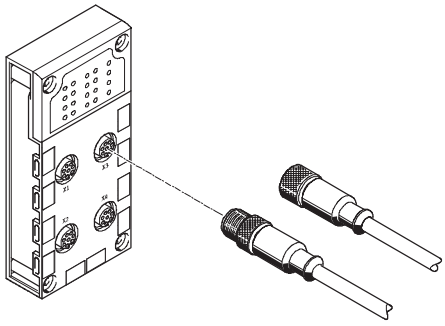
Festo delivers pre-assembled connecting cables on customer request:
- Individual
- Fits perfectly
- Installation-saving

CPX-AB-4-M12x2-5POL and CPX-AB-4-M12x2-5POL-R with 5-pin M12 (M12-5POL) connection



- Pre-assembled and sturdy with 2 channels per socket
- 4 sockets
- 5-pin design for each socket
- Version ...-R with Speedcon quick-lock technology and metal thread for screening

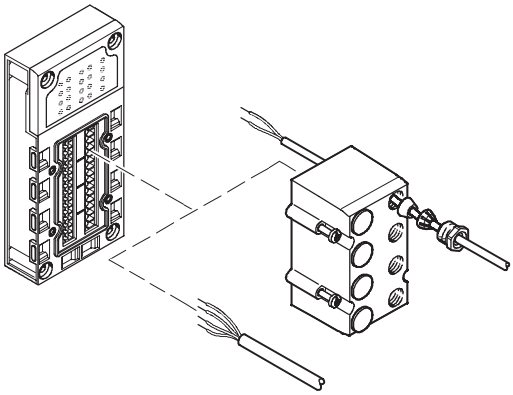
CPX-AB-4-M12-8POL with M12-8POL connection



- Connection to cylinder-valve combinations with max. 3 inputs and 2 outputs
- 4 sockets
- 8-pin design for each socket

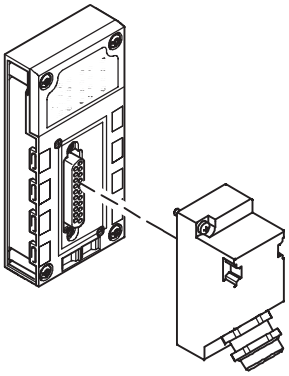
Electrical connection – Connection block

CPX-AB-8-KL-4POL with clamped terminal (CageClamp®) connection



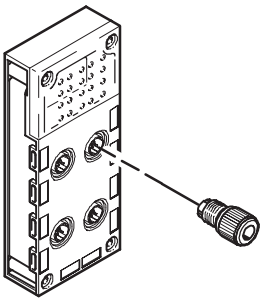
- Fast connection technology for use in control cabinets
- 32 CageClamp® spring-loaded terminals
- 4 terminals per channel
- Wire cross sections 0.05 ... 1.5 mm²
- Optional cover with fittings for IP65/67 connection
  - 8 through-holes M9
  - 1 through-hole M16
  - Blanking plugs
  - For I/O distributors, consoles or individual sensors/actuators

CPX-AB-1-SUB-BU-25POL with Sub-D connection



- Multi-pin connection for I/O distributor or console
- 1 socket
- 25-pin design

CPX-AB-4-HARx2-4POL with HARAX connection

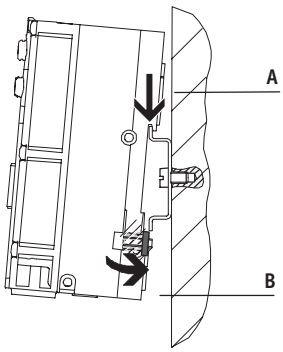


- Sturdy, fast connection technology for individual connections
- 4 sockets
- 4-pin design for each socket

Mounting options

Valve terminals with CPX terminal support different mounting methods for direct machine mounting with high protection and control cabinet installation.

H-rail mounting

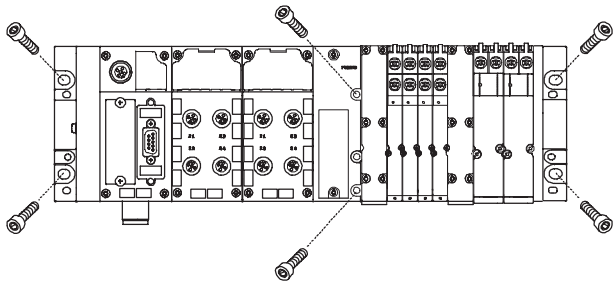


The H-rail mounting is formed in the reverse profile of the CPX interlinking blocks. The CPX terminal can be attached to the H-rail using the H-rail mounting.
The CPX terminal is attached to the H-rail for this purpose (see arrow A).

It is then swivelled on the H-rail and secured in place with the clamping component (see arrow B).
The optional earthing plate allows a convenient working connection to be established to the machine potential/earth.

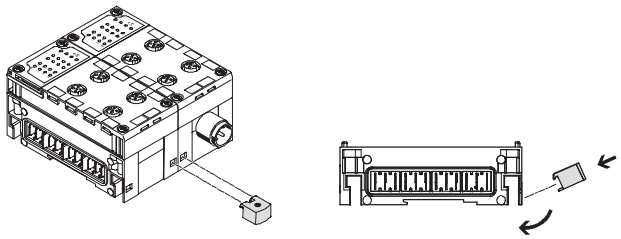
For H-rail mounting you will need the following mounting kit:
■ CPA-BG-NRH
This permits mounting of the CPX on H-rails to EN 60715.
An additional mounting kit is required for combination with valve terminals.

Wall mounting



The end plates of the CPX terminal, the valve terminal and the pneumatic interface include mounting holes for wall mounting.

Additional mountings

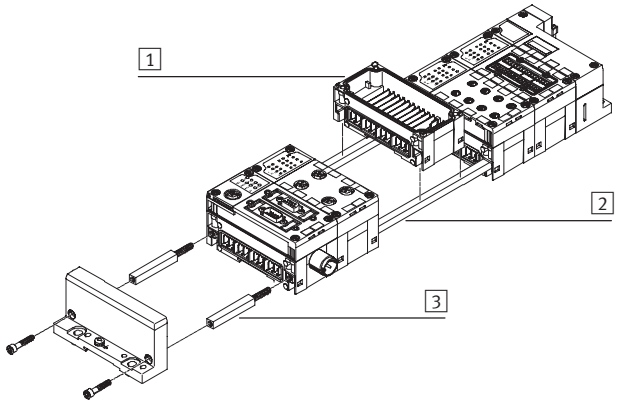


For longer valve terminals, there are additional mountings for the CPX terminal that can be fitted between two modules.

- - Note

In order to reduce stress caused by vibration or impact, it is recommended that an additional mounting be used for every 2 ... 3 modules.

Tie rod

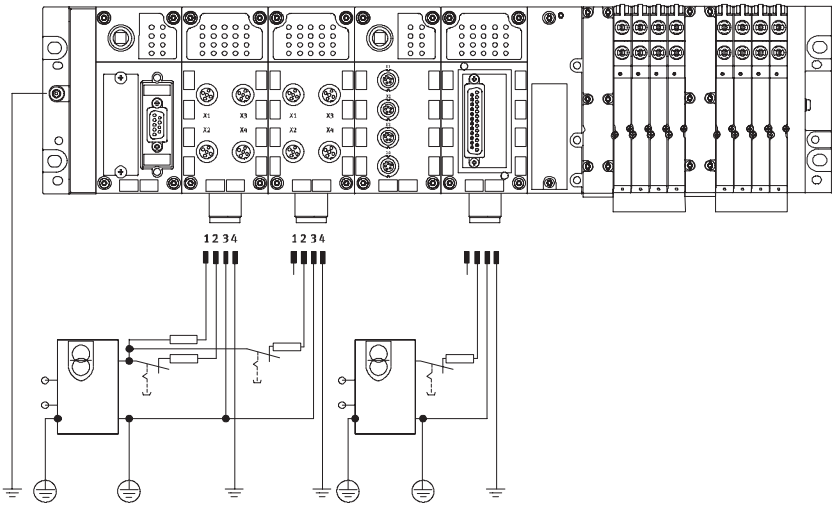


The mechanical connection between the CPX modules is created using special tie rods 2. Two screws in the end plates are all that are needed to assemble the entire unit.
The tie rod ensures that the unit resists high mechanical loads and is therefore the “mechanical backbone” of the CPX terminal.

The open design allows interlinking blocks 1 to be replaced in the assembled state.
The tie rod expansion kit 3 allows an extra module to be added to the CPX terminal.

Power supply concept

General information



The use of decentralised devices on the fieldbus – particularly with high protection for direct machine mounting – demands a flexible power supply concept. A valve terminal with CPX can supply all voltages using a single socket.

A distinction is made between supply for

- electronics plus sensors and
- valves plus actuators

in this case. The following connecting thread can be selected:

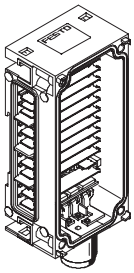
- M18
- 7/8"

Interlinking blocks

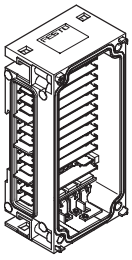
However, many applications require the CPX terminal to be segmented into voltage zones. This applies in particular to the separate disconnection of solenoid coils and outputs.

The separation of voltages for valves and different voltage segments for electrical outputs and sensors are supported by the different interlinking blocks.

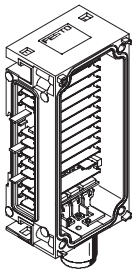
With system supply
CPX-GE-EV-S
CPX-GE-EV-S-7/8-5POL



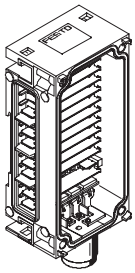
Without power supply
CPX-GE-EV



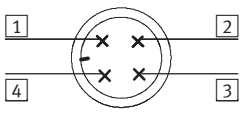
With additional power supply for outputs
CPX-GE-EV-Z
CPX-GE-EV-Z-7/8-5POL

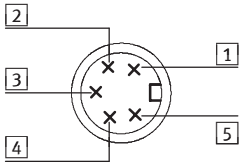


With additional power supply for valves
CPX-GE-EV-V



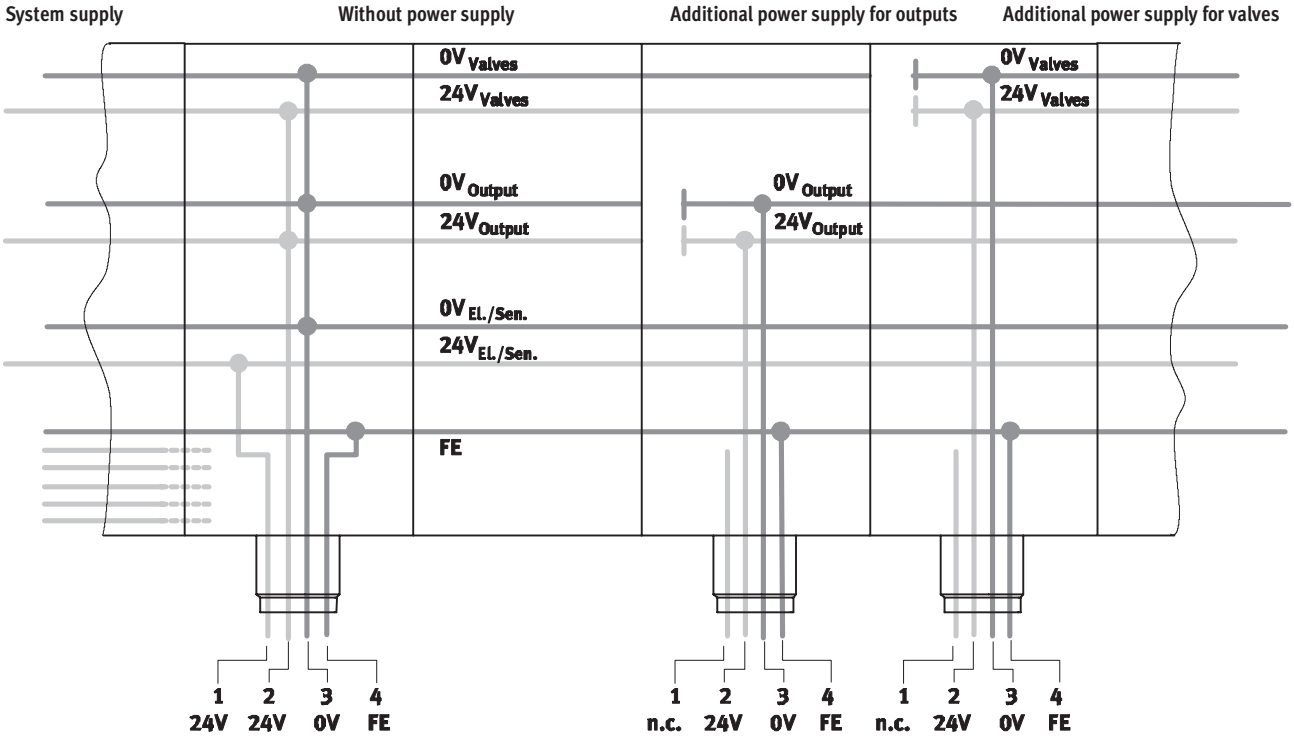
Pin allocation for voltage supply

Pin allocation for M18:	Pin	CPX-GE-EV-S Allocation	CPX-GE-EV-Z Allocation	CPX-GE-EV-V Allocation
	1	24 V DC supply voltage for electronics and sensors	n.c.	n.c.
	2	24 V DC load voltage supply for valves and outputs	24 V DC load voltage supply for outputs	24 V DC load voltage supply for valves
	3	0 V	0 V	0 V
	4	FE (earth)	FE (earth)	FE (earth)

Pin allocation for 7/8"	Pin	CPX-GE-EV-S-7/8-5POL	CPX-GE-EV-Z-7/8-5POL	
	1	0 V valves and outputs	0 V outputs	
	2	0 V electronics and sensors	n.c.	
	3	FE (earth)	FE (earth)	
	4	24 V DC supply voltage for electronics and sensors	n.c.	
	5	24 V DC load voltage supply for valves and outputs	24 V DC load voltage supply for outputs	

Power supply concept

Basic linking structure M18



General limit values and guidelines with M18 connection

System supply

The system supply provides the internal voltage for the entire CPX system with

- max. 16 A for sensors and electronics
- max. 16 A for valves and actuators

The connected electronics module for inputs/outputs or bus nodes tap off the required voltage.

Without power supply

All voltages are fed through to the next module by means of system linking.

The connected electronics module for inputs/outputs or bus nodes taps off the required voltage.

Additional power supply for outputs

The additional power supply for outputs interrupts the voltage of the outputs (0 V and 24 V DC) and supplies a new voltage

- max. 16 A for outputs per additional power supply

All other voltages are fed through. Isolation ensures that the output modules are electrically isolated from one another.

A connected output module and all subsequent modules to the right of it are supplied with the new voltage for outputs.

The power supply for the valves continues to be supplied by the system supply.

The additional power supply for the outputs must always be located to the right of the system supply.

There is no limit to the number of additional supply modules that can be used.

Additional power supply for valves

The additional power supply for valves interrupts the voltage of the valves (0 V and 24 V DC) and supplies a new voltage

- max. 16 A for valves per additional power supply

All other voltages are fed through. Isolation ensures that the valves are electrically isolated from one another.

The additional power supply for the valves must always be located to the right of the system supply.

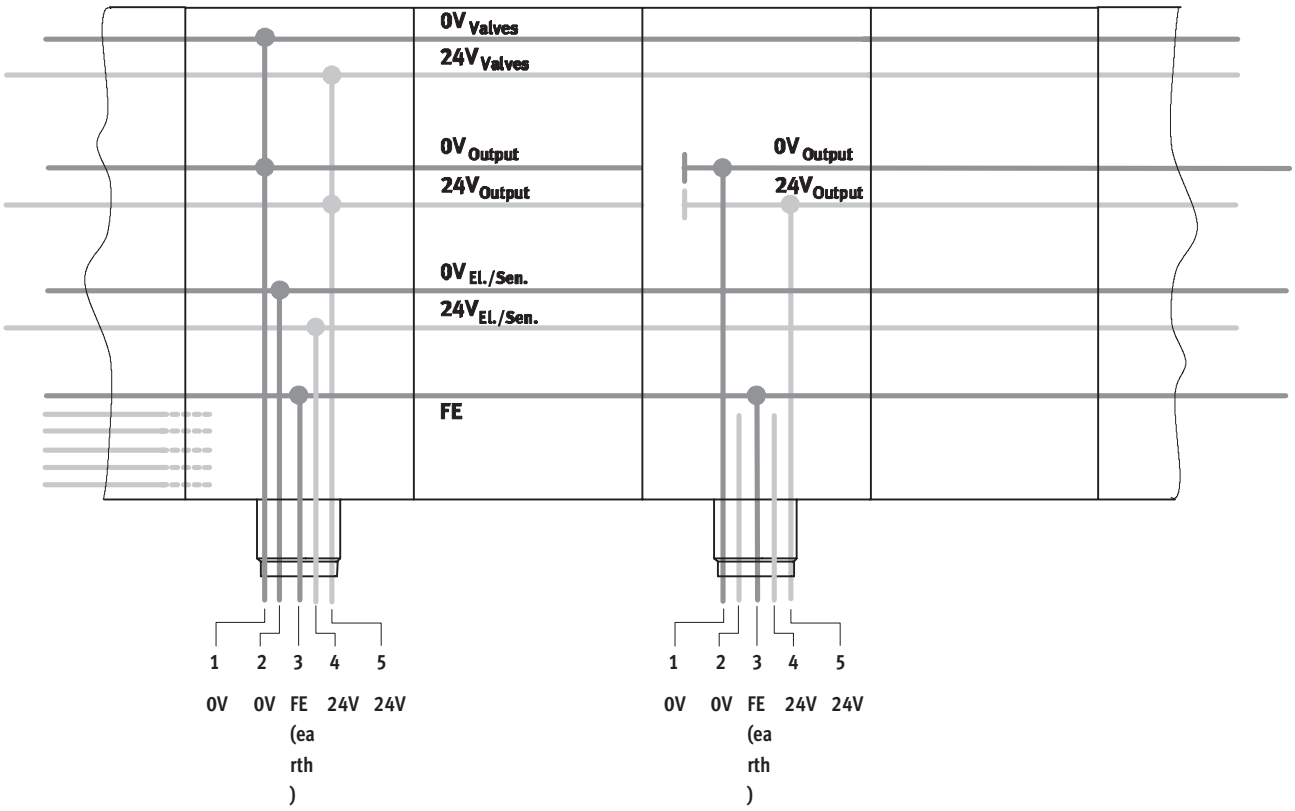
Only one additional power supply module may be used.

Power supply concept

Basic linking structure 7/8”

System supply

Additional power supply for outputs



General limit values and guidelines with 7/8” connection

System supply

The system supply provides the internal voltage for the entire CPX system with

- max. 12 A for sensors and electronics
- max. 12 A for valves and actuators

The connected electronics module for inputs/outputs or bus nodes taps off the required voltage.

The 5-pin plug permits electrical isolation of the load voltage supply for outputs/valves for the operating voltage of electronics/sensors.
All-pole disconnection of the valve supply voltage is thus made possible.

Additional power supply for outputs

The additional power supply for outputs interrupts the voltage of the outputs (0 V and 24 V DC) and supplies a new voltage

- max. 12 A for outputs per additional power supply.

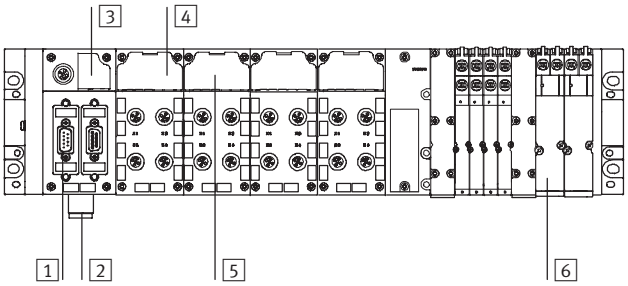
All other voltages are fed through.
Isolation ensures that the output modules are electrically isolated from one another.
A connected output module and all subsequent modules to the right of it are supplied with the new voltage for outputs.
The power supply for the valves continues to be supplied by the system supply.
The additional power supply for the outputs must always be located to the right of the system supply.
There is no limit to the number of additional supply modules that can be used.

- Note

Note the following for 7/8”:
– Commercially available accessories often limited to max. 8 A

Diagnosis

System performance



1 Diagnosis via bus interface
2 Undervoltage monitor
3 Diagnostic overview LED
– Fieldbus status
– CPX status
4 Status and diagnostic LED for module and I/O channels
5 Module and channel-specific diagnosis
6 Valve-specific diagnostic module and solenoid coils

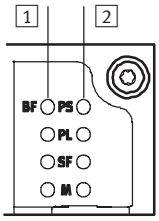
Detailed diagnostic functions are needed in order to quickly locate the causes of errors in the electrical installation and therefore reduce downtimes in production plants.
A basic distinction is made between on the spot diagnosis using LEDs or operator unit and diagnosis using a bus interface.

The CPX terminal supports on the spot diagnosis via a row of LEDs. This is separate from the connection area and therefore provides good visual access to status and diagnostic information.

Module and channel-specific diagnosis is supported, for example
- Undervoltage identification for the outputs and valves
- Short circuit detection for sensors, outputs and valves
- Open-load detection for a missing solenoid coil
- Storage of the last 40 causes of errors with error start and error end

The diagnostic messages can be read via bus interface in the master controller and visualised for the central recording and evaluation of error causes. This is done using the individual fieldbus-specific channels.
The CPX-FEC also offers the option of access via the integrated Ethernet interface (remote maintenance via PC/ web applications).

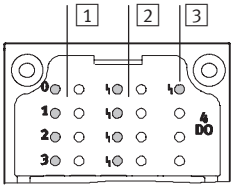
Overview of LEDs on the bus node



1 Fieldbus-specific LEDs
On each bus node, a maximum of 4 fieldbus-specific LEDs display the fieldbus communication status of the CPX terminal with the master controller.

2 CPX-specific LEDs
A further 4 CPX-specific LEDs provide non-fieldbus-specific information about the status of the CPX terminal, for example
– Power system
– Power load
– System errors
– Modification parameters

Input/output module status and diagnostic LEDs

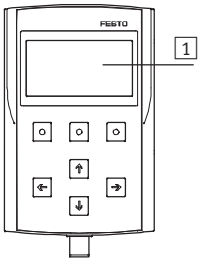


1 Status LEDs for inputs and outputs
Each input and output channel is assigned a status LED.

2 Channel-oriented diagnostic LED
Depending on the module design, another diagnostic LED is available for each I/O channel.

3 Central diagnostic LED
An LED displays a collective diagnosis for each module.

Operator unit display



1 LCD graphical display for normal text diagnosis

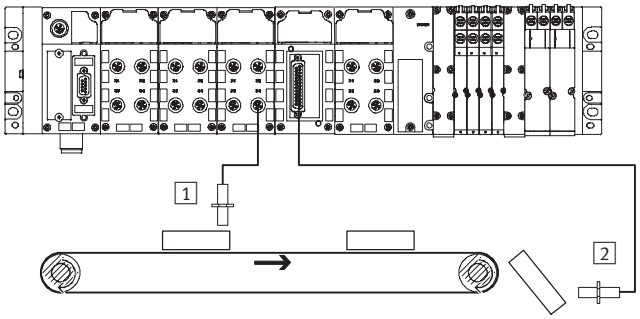
Parameterisation

Changes to the application are often required during commissioning. Thanks to the parameterisable characteristics of CPX modules, functions can be very easily changed by means of configuration software. This reduces the number of modules and, consequently, the amount of storage space required.

It is therefore possible for example to reduce the input debounce time for an input module – normally 3 ms – to 0.1 ms on a “fast” input module for faster processes, or to set the response of a valve following a fieldbus interrupt.

Depending on the modules used, parameterisation can be performed via the following interfaces:

- Ethernet
- Fieldbus
- FEC direct interface (programming interface)
- Operator unit CPX-MMI



1 Input debounce time 3 ms
2 Input debounce time 0.1 ms

Addressing

General information about addressing

The various CPX modules occupy a different number of I/O addresses within the CPX system. The maximum address space for bus nodes depends on the performance of the fieldbus system.

Maximum system extension:
- 1 bus node or control block
- 9 I/O modules
- 1 pneumatic interface (e.g. pneumatic interface MPA with up to 16 MPA modules)

The maximum system extension can be limited in individual cases by exceeding the address space.

Note

Please refer to the detailed description of the configuration/addressing rules in the technical data for CPX bus nodes.

Overview – Allocated addresses for CPX modules

	Inputs [bit]	Outputs [bit]
CPX-8DE	8	–
CPX-8DE-D	8	–
CPX-4DE	4	–
CPX-4DA	–	4
CPX-8DA	–	8
CPX-8DE-8DA	8	8
CPX-2AE	2 x 16	–
CPX-4AE-I	4 x 16	–
CPX-4AE-T	4 x 16	–
CPX-2AA	–	2 x 16
VABA-1S6-X1	–	8, 16, 24, 32[1)]
CPX-GP-CPA-10	–	8, 16, 24[1)]
CPX-GP-CPA-14	–	8, 16, 24[1)]
CPX-GP-03-4,0	–	8, 16, 24, 32[1)]
VMPA1-FB-EMS-8	–	8
VMPA-FB-EMG-8	–	8
VMPA2-FB-EMS-4	–	4
VMPA2-FB-EMG-4	–	4

1) Depends on the DIL switch setting on the pneumatic interface

Overview – Address space for CPX bus node and control block

	Protocol	Max. total		Max. digital		Max. analogue	
		inputs	outputs	inputs	outputs	inputs	outputs
CPX-FEC	■ TCP/IP ■ Easy IP ■ Modbus TCP ■ HTTP	512 bit	512 bit				
CPX-FB6	Interbus	96 bit	96 bit	96 DI	96 DO	6 AI	6 AO
CPX-FB11	DeviceNet	512 bit	512 bit	512 DI	512 DO	18 AI	18 AO
CPX-FB13	Profibus	512 bit	512 bit	512 DI	512 DO	18 AI	18 AO
CPX-FB14	CANopen	192 bit	192 bit	64 DI (+ 64 DI)	64 DO (+ 64 DO)	8 AI (+ 8 AI)	8 AO (+ 8 AO)
CPX-FB23	CC-Link	–	–	64 DI	64 DO	16 AI	16 AO

Example – CPX-FB6 (Interbus)

	Digital inputs	Digital outputs	Remarks
3x CPX-8DE	24	–	■ The address space is occupied with 7 CPX I/O modules plus pneumatic interface ■ No additional modules can be configured
1x CPX-8DE-8DA	8	8	
2x CPX-2AE	64	–	
1x CPX-2AA	–	32	
3x VMPA1	–	24	
Allocated address space	96	96	

DI = Digital inputs (1 bit) DO = Digital outputs (1 bit) AO = Analogue outputs (16 bit) AI = Analogue inputs (16 bit)

SEA – GS – HAR – 4POL

Type	
SEA	Plug connector for inputs/outputs, M12x1 connection

Design	
GS	Straight plug connector

Connection	
HAR	Harax fast connection technology

Number of pins	
4POL	4-pin

SD – SUB–D – ST25

Type	
SD	Plug connector for inputs/outputs

Design	
SUB-D	SUB-D

Cable connection	
ST25	Connection pin, 25-pin

FBA – 1 – SL – 5POL –

Type	
FBA	Bus connection, Sub-D socket, 9-pin

Number of cable connections	
1	1 connection
2	2 connections

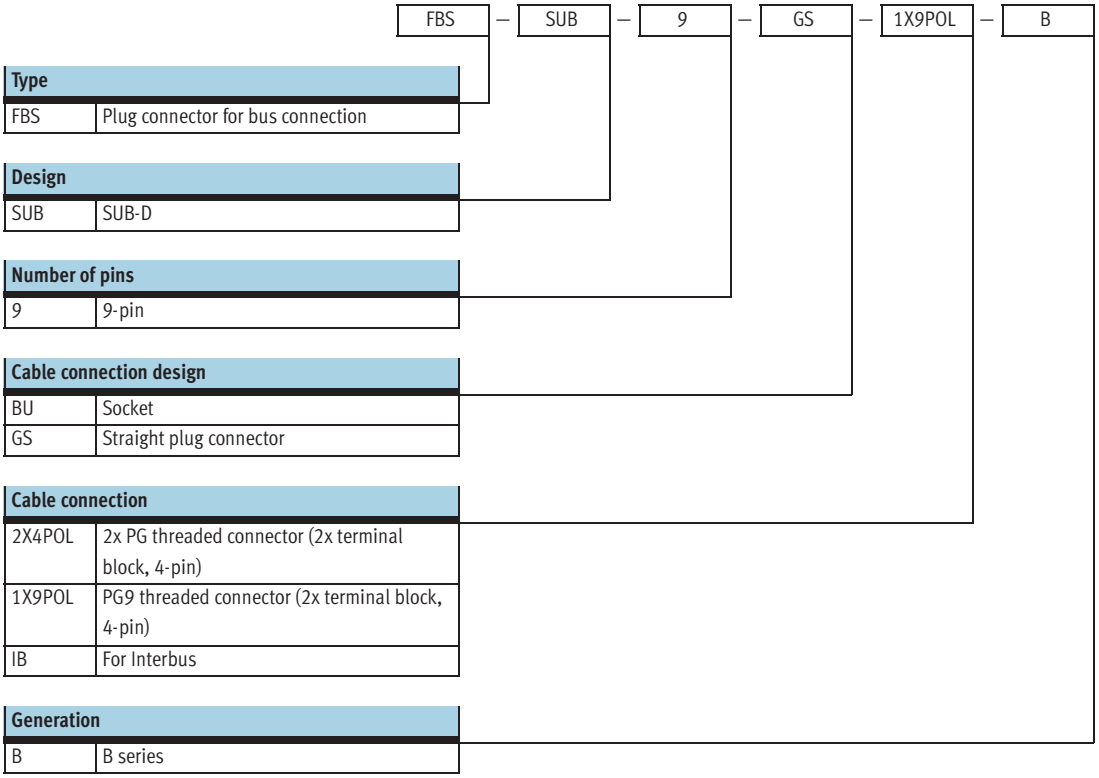
Cable connection	
M12	2x threaded connections M12x1, 5-pin (1x pin, 1x socket)
SL	5-pin row

Number of pins	
5POL	5-pin

Coding	
RK	Reverse Key coded (B-coded)

Terminal CPX

Key features – Type designations



Type	
FBS	Plug connector for bus connection

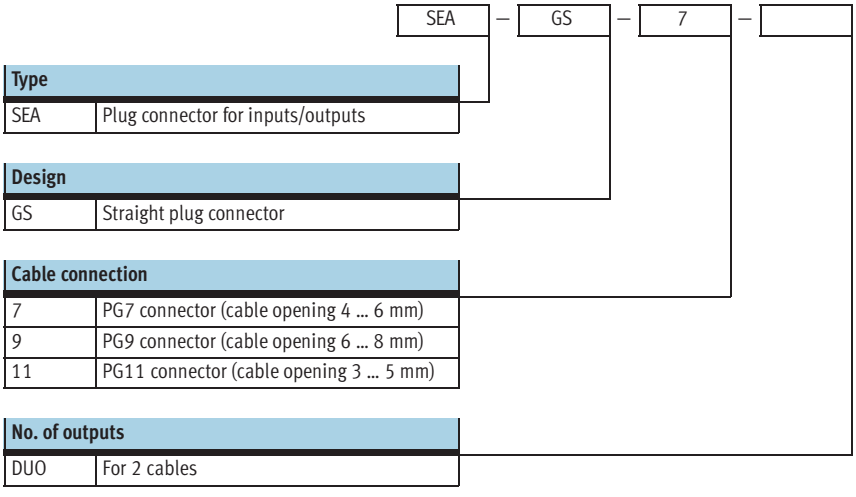
Design	
SUB	SUB-D

Number of pins	
9	9-pin

Cable connection design	
BU	Socket
GS	Straight plug connector

Cable connection	
2X4POL	2x PG threaded connector (2x terminal block, 4-pin)
1X9POL	PG9 threaded connector (2x terminal block, 4-pin)
IB	For Interbus

Generation	
B	B series

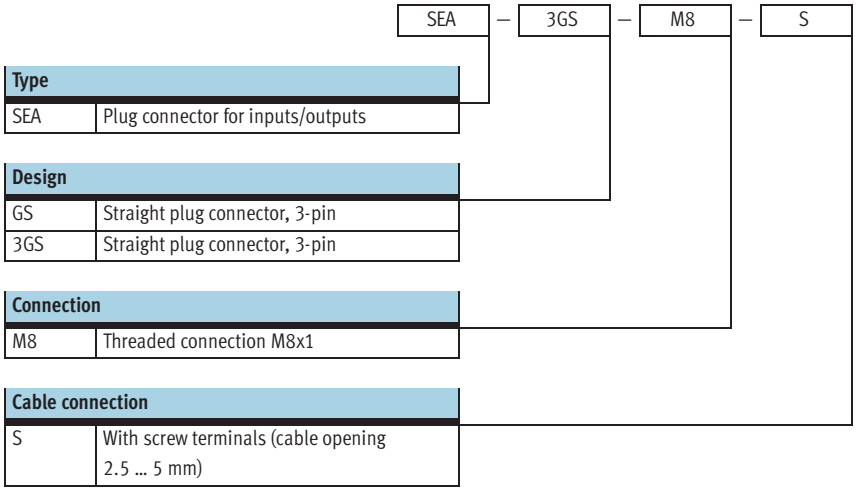


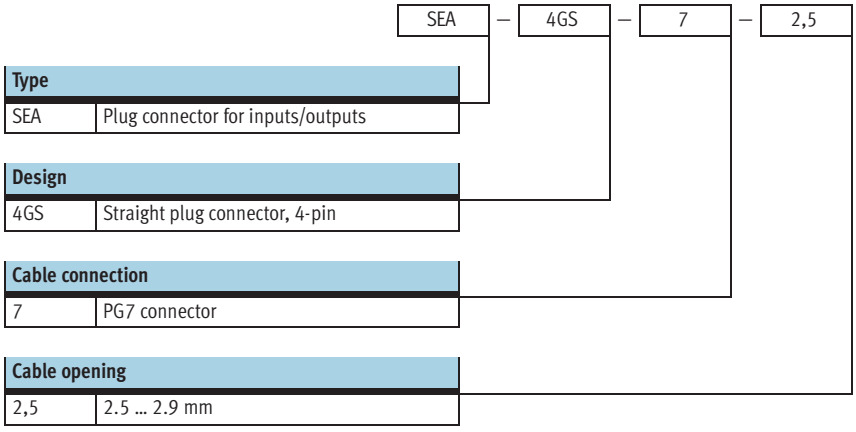
Type	
SEA	Plug connector for inputs/outputs

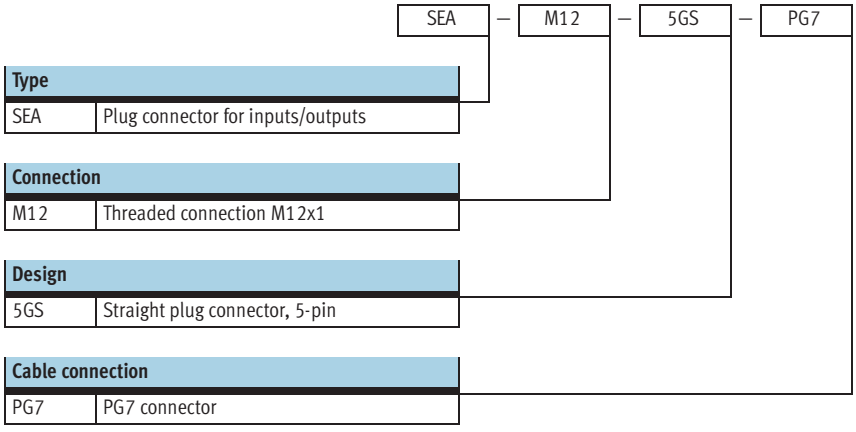
Design	
GS	Straight plug connector

Cable connection	
7	PG7 connector (cable opening 4 ... 6 mm)
9	PG9 connector (cable opening 6 ... 8 mm)
11	PG11 connector (cable opening 3 ... 5 mm)

No. of outputs	
DUO	For 2 cables


SEA – 3GS – M8 – S
Type
SEA Plug connector for inputs/outputs
Design
GS Straight plug connector, 3-pin
3GS Straight plug connector, 3-pin
Connection
M8 Threaded connection M8x1
Cable connection
S With screw terminals (cable opening 2.5 ... 5 mm)


SEA – 4GS – 7 – 2,5
Type
SEA Plug connector for inputs/outputs
Design
4GS Straight plug connector, 4-pin
Cable connection
7 PG7 connector
Cable opening
2,5 2.5 ... 2.9 mm


SEA – M12 – 5GS – PG7
Type
SEA Plug connector for inputs/outputs
Connection
M12 Threaded connection M12x1
Design
5GS Straight plug connector, 5-pin
Cable connection
PG7 PG7 connector

Terminal CPX

Key features – Type designations

NTSD – GD – 13,5

Type	
NTSD	Plug socket for mains connection

Design	
GD	Straight socket, 4-pin

Cable connection	
9	PG9 connector (cable opening 6 ... 8 mm)
13,5	PG13.5 connector

NTSD – WD – 9

Type	
NTSD	Plug socket for mains connection

Design	
WD	Angled plug socket, 4-pin

Cable connection	
9	Cable opening 6 ... 11 mm
11	Cable opening 5 ... 11 mm

CPX–AB – 2 – M12 – RK – IB

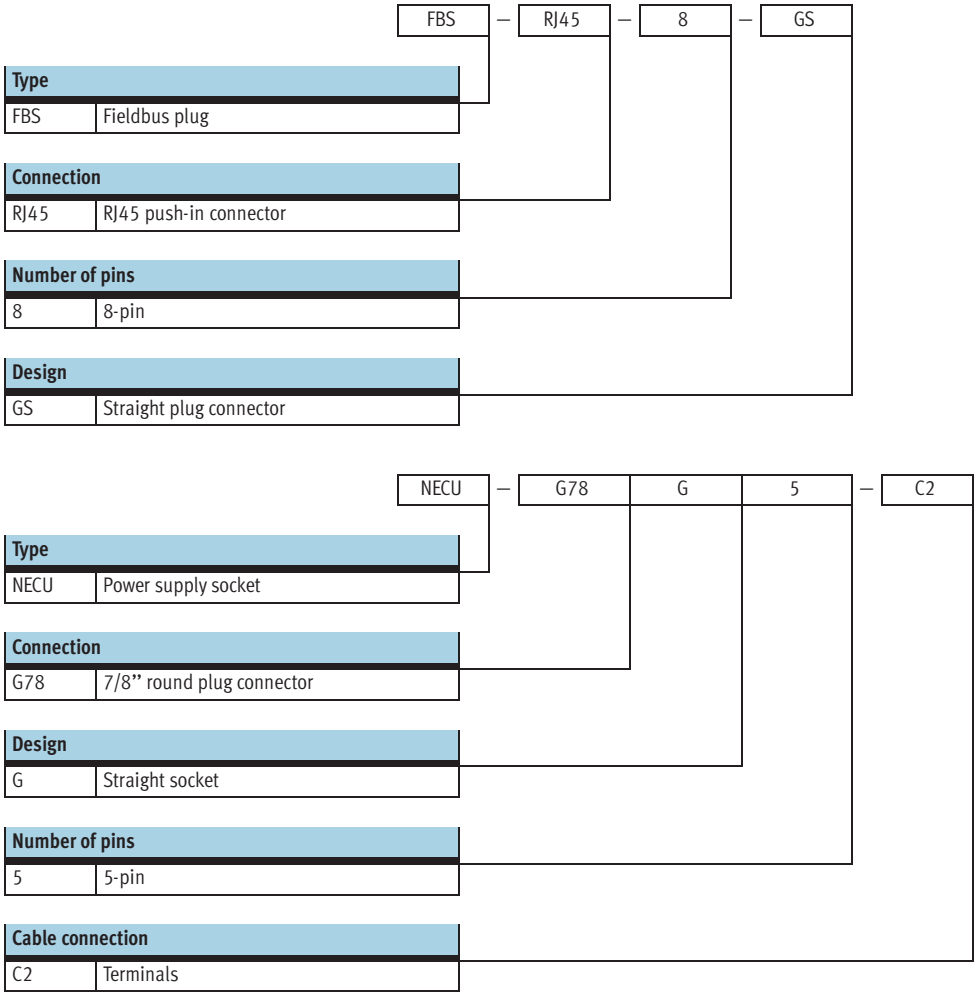
Type	
CPX-AB	Connection block for CPX Profibus node

Number of cable connections	
2	2 connections

Connection	
M12	Threaded connection M12x1

Coding	
RK	Reverse Key coded (B-coded)

Cable connection	
IB	For Interbus
DP	For Profibus


FBS – RJ45 – 8 – GS
Type
FBS Fieldbus plug
Connection
RJ45 RJ45 push-in connector
Number of pins
8 8-pin
Design
GS Straight plug connector
NECU – G78 – G – 5 – C2
Type
NECU Power supply socket
Connection
G78 7/8" round plug connector
Design
G Straight socket
Number of pins
5 5-pin
Cable connection
C2 Terminals

Terminal CPX

Technical data

FESTO

Module width
50 mm

Note

The data given here applies to the CPX system. If components that conform to lower values are used in the system, the specification for the entire system is reduced to the values for the components used.

Example

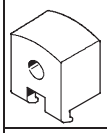
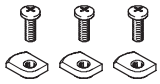
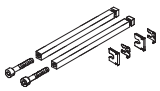
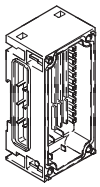
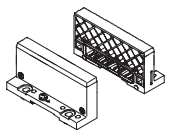
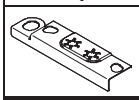
Protection class IP65/IP67 applies only to the fully assembled system with fitted plugs or covers. If components with a lower protection class are used, the protection level of the entire system is reduced to the protection class of the component with the lowest protection level, e.g. Cage-Clamp connection block with IP20 protection or MPA pneumatics with IP65 protection.

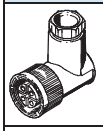
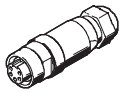
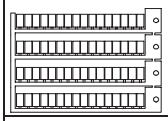
General technical data			
Module No.			**197 330**
Max. no. of modules[1)]	Control block		1
	Bus node		1
	I/O module/CP interface		9
	Pneumatic interface		1
Max. address capacity	Inputs	[byte]	64
	Outputs	[byte]	64
Internal cycle time		[ms]	< 1
Configuration support			Fieldbus-specific
LED displays	Bus node/control block		Up to 4 LEDs, bus-specific 4 LEDs, CPX-specific ■ PS = Power system ■ PL = Power load ■ SF = System error ■ M = Modify parameter/forcing active
	I/O modules		Min. one centralised diagnostic LED Channel-oriented status and diagnostic LED, depending on module
	Pneumatic interface		One centralised diagnostic LED Valve status LED on valve
Diagnosis			■ Channel and module-oriented diagnosis for inputs/outputs and valves ■ Detection of module undervoltage for the different voltage potential values ■ Storage of the last 40 errors with timestamp (acyclic access)

1) A maximum of 11 modules in total can be combined
(e.g. 1 control block + 9 I/O modules + 1 pneumatic interface, or 1 control block + 1 bus node + 8 I/O modules + 1 pneumatic interface)

General technical data			
Module No.			**197 330**
Parameterisation			Module-specific and entire system, for example: ■ Diagnostic behaviour ■ Condition monitoring ■ Profile of inputs ■ Failsafe response of outputs and valves
Commissioning support			Forcing of inputs and outputs
Protection class to EN 60 529			IP65/IP67
Voltage supply		[V DC]	24
Power supply	Interlinking block with system supply		
	Electronics plus sensors	[A]	Max. 16 A (M18 supply), max. 12 A (7/8" supply)
	Actuators plus valves	[A]	Max. 16 A (M18 supply), max. 12 A (7/8" supply)
	Additional power supply Actuators	[A]	Max. 16 A per M18 supply, max. 12 A per 7/8" supply
	Additional power supply for valves	[A]	Max. 16 A per M18 supply
Current consumption			Depending on system configuration
Power failure buffering (bus electronics only)		[ms]	10
Voltage supply connection			M18, 4-pin 7/8" 5-pin
Fuse concept			Per module with electronic fuses
Temperature range, electronics	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Temperature range, electronics plus pneumatic components	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +40
Relative air humidity (non-condensing)		[%]	5 ... 90
Tests	Vibration test To DIN/IEC 68/EN 60 068 Part 2 – 6		■ For wall mounting: Severity level 2 ■ For H-rail mounting: Severity level 1
	Shock test To DIN/IEC 68/EN 60 068 Part 2 – 27		■ For wall mounting: Severity level 2 ■ For H-rail mounting: Severity level 1
PWIS classification			Free of paint wetting impairment substances
Interference immunity			EN 61 000-6-2 (industry)
Interference emission			EN 61 000-6-4 (industry)
Isolation test for electrically isolated circuits to IEC 1131 Part 2		[V]	500 DC
Electrical isolation of electrical voltages		[V]	80 DC
Protection against direct and indirect contact			PELV (Protected Extra-Low Voltage)
Materials			Polymer (end plates: die-cast aluminium)
Grid dimension		[mm]	50

Weights [g]					
Control block	FEC	140.0	Connection block		70.0
Bus node	FB6	125.0	Tie rod	1-fold	19.0 ±2.5
	FB11	120.0		2-fold	32.5 ±2.5
	FB13	115.0		3-fold	46.0 ±2.5
	FB14	115.0		4-fold	59.5 ±2.5
	FB23	115.0		5-fold	73.0 ±2.5
I/O module		38.0		6-fold	86.5 ±2.5
CP interface		140		7-fold	100.0 ±2.5
Pneumatic interface	MPA	238.4		8-fold	113.5 ±2.5
	VTSA	485.0		9-fold	127.0 ±2.5
	MIDI/MAXI	390.0		10-fold	140.5 ±2.5
	CPA	150.0	End plate	Left	77.0
Interlinking block	Without power supply	80.0		Right	70.0
	With system supply	100.0			

Ordering data – Accessories				
Designation			Type	Part No.
Mounting				
	Attachment for wall mounting (for long valve terminals, 10 pieces)		**CPX-BG-RW-10x**	**529 040**
	Attachment for H-rail	CPX without pneumatic components	**CPA-BG-NRH**	**173 498**
		CPX-VTSA	**CPX-CPA-BG-NRH**	**526 032**
		CPX-MPA		
		CPX-CPA		
		CPX-MIDI	**CPX-03-4,0**	**526 033**
		CPX-MAXI	**CPX-03-7,0**	**526 034**
Tie rod				
	Tie rod CPX	Extension 1-fold	**CPX-ZA-1-E**	**525 418**
		1-fold	**CPX-ZA-1**	**195 718**
		2-fold	**CPX-ZA-2**	**195 720**
		3-fold	**CPX-ZA-3**	**195 722**
		4-fold	**CPX-ZA-4**	**195 724**
		5-fold	**CPX-ZA-5**	**195 726**
		6-fold	**CPX-ZA-6**	**195 728**
		7-fold	**CPX-ZA-7**	**195 730**
		8-fold	**CPX-ZA-8**	**195 732**
		9-fold	**CPX-ZA-9**	**195 734**
		10-fold	**CPX-ZA-10**	**195 736**
Electrical interlinking block				
	Basic unit, without voltage input	–	**CPX-GE-EV**	**195 742**
	with system supply	M18	**CPX-GE-EV-S**	**195 746**
		7/8"	**CPX-GE-EV-S-7/8-5POL**	**541 244**
	with additional power supply for outputs	M18	**CPX-GE-EV-Z**	**195 744**
		7/8"	**CPX-GE-EV-Z-7/8-5POL**	**541 246**
	with additional power supply for valves	M18	**CPX-GE-EV-V**	**533 577**
End plates				
	End plate	right	**CPX-EPR-EV**	**195 714**
		left	**CPX-EPL-EV**	**195 716**
	Earthing element for right-hand/left-hand end plates (5 pieces)		**CPX-EPFE-EV**	**538 892**

Ordering data – Accessories				
Designation			Type	Part No.
Plug sockets				
	Plug socket for mains connection, straight	for 1.5 mm²	**NTSD-GD-9**	**18 493**
		for 2.5 mm²	**NTSD-GD-13,5**	**18 526**
	Plug socket for mains connection, angled	for 1.5 mm²	**NTSD-WD-9**	**18 527**
		for 2.5 mm²	**NTSD-WD-11**	**533 119**
	Power supply socket	7/8" connection	**NECU-G78G5-C2**	**543 107**
Inscription labels				
	Inscription labels, 6x10, 64 pieces, in frames		**IBS-6x10**	**18 576**
User documentation				
	User documentation for CPX System Manual	German	**P.BE-CPX-SYS-DE**	**526 445**
		English	**P.BE-CPX-SYS-EN**	**526 446**
		Spanish	**P.BE-CPX-SYS-ES**	**526 447**
		French	**P.BE-CPX-SYS-FR**	**526 448**
		Italian	**P.BE-CPX-SYS-IT**	**526 449**
		Swedish	**P.BE-CPX-SYS-SV**	**526 450**

User documentation – General information

Comprehensive user documentation is vital for the fast and consistent implementation of fieldbus components.
The documentation provided by Festo contains step-by-step instructions for using CPX terminals:

1. Installation
2. Commissioning and parameterisation
3. Diagnosis

Application-oriented explanations are provided for integration of the CPX terminal in the programming and configuration software of the various controller manufacturers.
Use the order code to select the language you want.
The manual for the configuration you have ordered is supplied automatically.

User documentation overview

Type	Title	Description
Electronic components		
P.BE-CPX-SYS-...	System description – Installing and commissioning CPX terminals	Overview of the design, components and mode of operation of the CPX terminal; installation and commissioning instructions as well as basic principles of parameterisation.
P.BE-CPX-EA-...	CPX I/O modules, digital	Connection technology and assembly, installation and commissioning instructions for input and output modules of type CPX-... as well as the CPA, MIDI/MAXI and MPA pneumatic interface.
P.BE-CPX-AX-...	CPX I/O modules, analogue	Connection technology and assembly, installation and commissioning instructions for input and output modules of type CPX-... as well as the CPA, MIDI/MAXI and MPA pneumatic interface.
P.BE-CPX-CP...	CPX CP interface	Instructions on assembly, installation, commissioning and diagnosis of the CP interface.
P.BE-CPX-FB...	CPX fieldbus node	Instructions on assembly, installation, commissioning and diagnosis of the relevant bus nodes.
P.BE-CPX-FEC...	CPX control block	Instructions on assembly, installation, commissioning and diagnosis of the relevant control block.
Pneumatic components		
P.BE-VTSA-44-...	Valve terminals with VTSA pneumatics	Instructions on assembly, installation, commissioning and diagnosis of the VTSA pneumatic components.
P.BE-CPA-...	Valve terminals with CPA pneumatics	Instructions on assembly, installation, commissioning and diagnosis of the CPA pneumatic components.
P.BE-Midi/Maxi-03-...	Valve terminals with MIDI/MAXI pneumatics	Instructions on assembly, installation, commissioning and diagnosis of the MIDI/MAXI pneumatic components.
P.BE-MPA-...	Valve terminals with MPA pneumatics	Instructions on assembly, installation, commissioning and diagnosis of the MPA pneumatic components.

User documentation – GSD, EDS, etc.

Device description files and icons are used to explain integration of the CPX terminal in the configuration software of the various controller manufacturers.
These can be downloaded quickly and conveniently from the download area of the Festo Internet home page.

➔ www.festo.com/fieldbus

CPX macro library for ePLAN

Type	**GSWC-TE-EP-LA**
Part No.	**537 041**

Engineering – pure service:
ePLan macros for fast and reliable engineering of electrical projects in combination with valve terminals.
Available in German and English.

Systematically more reliable:
The CPX macro library contains symbols, graphics and master data. The end product: A fast, reliable and standardised system for designing and documenting your circuits.

Simply practical:
High level of planning reliability, standardisation of documentation, no need to create symbols, graphics and master data since everything is stored in the CPX macro library.

Key technical data

- CD with CPX macro library ePLAN 5 for terminal CPX (supports the engineering of bus nodes, interlinking blocks, I/O modules, connection blocks, pneumatic interface and valves)
- Creation and administration of projects
- Creation and editing of circuit diagrams, terminal and cable plans, cross-reference lists, assembly drawings, bills of material and maintenance plans
- Connection to programmable logic controllers
- Generation of the contact and potential cross-references
- Automatic protective contact mirroring
- Generation of documents in paper format and HTML format for viewing in browsers, etc. Library in DXF format for use with AutoCad or other CAD programs

Design example:

From an idea to a functional solution – quickly and reliably
Project engineering, design, production, assembly, commissioning, service

↓

Problem definition/ engineering of electrical project

↓

Efficient PC-based design system

↓

CPX macro

↓

ePLAN CAE software for electrical applications

↓

PC

↓

Documentation

Circuit diagrams
bills of material in paper format, optional representation in browsers (HTML)

Terminal CPX

Technical data – Operator unit

FESTO

Width
81 mm

The operator unit is a small, handy commissioning and service device for the CPX terminal. It provides data request, configuration and diagnosis functions for CPX terminals. Its extremely flexible application range means that data can be read in or out at any location. IP65 compatibility makes it suitable for use in harsh industrial environments.

Application

Functions

- Advance commissioning through the monitoring/forcing of inputs and outputs without fieldbus master/PLC
- Test function for parameter settings, e.g. fail-safe of the outputs or switch-on delay of the inputs
- Normal text diagnosis of module and channel-oriented errors
- Condition monitoring: Preselection/loading of counters, activation of the channels to be monitored
- Display of the last 40 error events with timestamp
- Identification of sporadic causes of errors through display of the diagnostic history
- Password protection

Connection

The operator unit is connected to the CPX bus nodes or control block, as appropriate, using a pre-assembled M12 cable.
The voltage for the operator unit is supplied through the CPX bus node.
➔ Plug&Work.

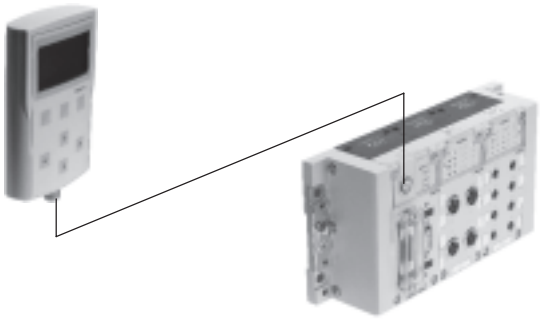
Communication

Once connected to the CPX terminal, the operator unit loads the available configuration for the I/O modules, valves, etc.
This ensures the availability of up-to-date texts, messages, menus and displays.
Status information, diagnostic messages and parameter bits are exchanged during operation.

Mounting

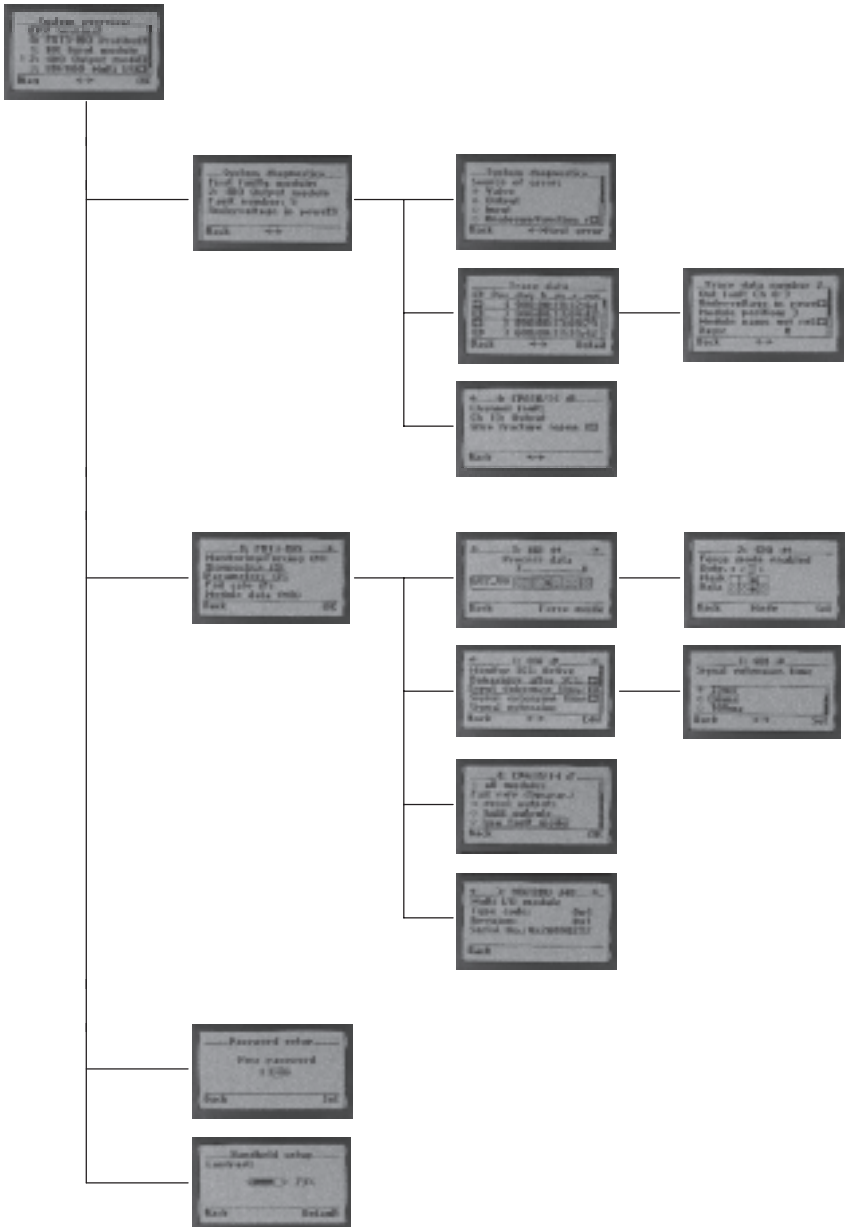
A mounting bracket for the operator unit offers the option of wall or H-rail mounting.
The mounting bracket also has an option for temporary mounting using a hanging device.

Connection



The operator unit is connected to the CPX terminal using pre-assembled cables.

Function examples



System overview

- Overview of configured modules and current diagnostic messages

Diagnosis

- Fast access to the diagnostic history and the modules with diagnostic message
- Display of the last 40 error messages with timestamp
- Display of the current diagnostic message for a module

Commissioning

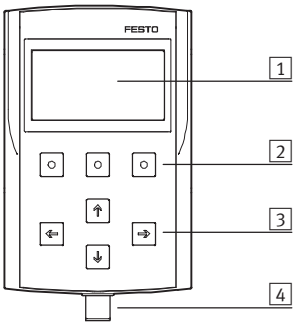
- Selection of module-specific data and parameters
- Display and modification of the current status of the inputs and outputs of a module
- Display and modification of the current settings for module-specific parameters

Setup

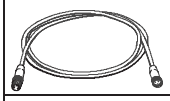
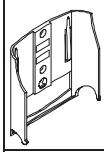
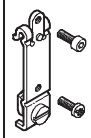
- Setting of access permission (password)
- Contrast setting of the display

General technical data			
Type			**CPX-MMI-1**
Part No.			**529 043**
Display component			LCD graphical display with background illumination (128 x 64 pixels)
Control elements			7 keys: 4 arrow keys and 3 function keys
Interface			M12-5-pin
Electromagnetic compatibility			Interference emission tested to EN 50081-2, industry
			Interference immunity tested to EN 61000-6-2, industry
Operating voltage		[V]	24 DC, supplied from the connected device
Current consumption		[mA]	Max. 55
Protection class to EN 60529			IP65, IP67
Relative air humidity		[%]	90, non-condensing
Vibration resistance			Tested to DIN/IEC 68/EN 60068, Parts 2-6 ■ For wall mounting: Severity level 2 ■ For H-rail mounting: Severity level 1
Shock resistance			Tested to DIN/IEC 68/EN 60068, Parts 2-27 ■ For wall mounting: Severity level 2 ■ For H-rail mounting: Severity level 1
Temperature range	Operation	[°C]	0 ... +50
	Storage/transport	[°C]	–20 ... +70
Material			Reinforced polyamide
Dimensions (W x H x D)		[mm]	81 x 137 x 28
Weight		[g]	150

Connection and display components



1 Display (LCD display)
2 Function keys
3 Arrow keys
4 M12 interface

Ordering data				
Designation			Type	Part No.
Cable				
	Extension cable M12-M12	1.5 m	**KV-M12-M12-1,5**	**529 044**
		3.5 m	**KV-M12-M12-3,5**	**530 901**
Mounting				
	Bracket		**CPX-MMI-1-H**	**534 705**
	Mounting for H-rail		**CPX-MMI-1-NRH**	**536 689**
User documentation				
	User manual for operator unit CPX-MMI-1	German	**P.BE-CPX-MMI-1-DE**	**534 824**
		English	**P.BE-CPX-MMI-1-EN**	**534 825**
		French	**P.BE-CPX-MMI-1-FR**	**534 827**
		Italian	**P.BE-CPX-MMI-1-IT**	**534 828**
		Swedish	**P.BE-CPX-MMI-1-SV**	**534 829**
		Spanish	**P.BE-CPX-MMI-1-ES**	**534 826**

Terminal CPX

Technical data – Control block CPX-FEC

FESTO

Ethernet

Powerful control block for pre-processing actuation of the CPX modules.
The voltage supply to and communication with other modules takes place via the interlinking block. In addition to the connection for the Ethernet interface in RJ45 and a programming interface in Sub-D, LEDs are also provided for the bus status, operating status of the PLC and CPX peripherals information, as are switch elements and a diagnostic interface for CPX-MMI.

Application

Bus connection

The CPX-FEC is a separate controller, which can be connected to a higher-order PLC via the fieldbus nodes of the CPX terminal or via Ethernet. At the same time, it is possible to operate the CPX-FEC as a compact stand-alone controller directly on the machine.

Operating modes

- Standalone/EasyIP
- Fieldbus remote controller
- Modbus/TCP remote controller
- Remote I/O Modbus/TCP

Communication protocols

- Profibus, DeviceNet, Interbus, CANopen and CC-Link via CPX fieldbus nodes
- Modbus/TCP
- EasyIP
- IP
- TCP
- UDP
- SMTP
- HTTP
- DHCP
- BootP
- TFTP

Setting options

For monitoring, programming and commissioning, CPX-FEC has the following interfaces:

- for the CPX-MMI
- Serial interface RS232 for a Front End Display (FED), for example
- Ethernet interface for IT applications

The operating mode and fieldbus protocol are set using the DIL switch on the CPX-FEC.

The integrated web server offers a convenient means of querying data saved in the CPX-FEC.

General technical data			
Type			**CPX-FEC-1-IE**
Part No.			**529 041**
Ethernet interface			RJ45 (8-pin, socket)
Data interface			RS232 (Sub-D, 9-pin, socket)
MMI interface			M12, 5-pin, socket
Baud rates	Ethernet interface	[Mbps]	10/100 (acc. to IEEE802.3, 10BaseT)
	Data interface	[kbps]	9.6 ... 115.2
	MMI interface	[kbps]	56.6
Protocol			■ TCP/IP ■ EasyIP ■ Modbus TCP ■ HTTP
Processing time for 1,024 binary instructions		[ms]	Approx. 1
Flags			M0.0 ... M9999, addressable as bits or words
	No. of time flags		T0 ... T255
	Time range	[s]	0.01 to 655.35
	No. of counting flags		Z0 ... Z255
	Counting range		0 to 65535
Register			R0 ... R255, addressable as words
Special FE			FE 0 ... 255, init flag
IP address setting			BOOTP/DHCP via FST or via MMI
Max. address capacity	Inputs	[Byte]	64
	Outputs	[Byte]	64
Program memory	User program	[kB]	250
	WEB applications	[kB]	550
Programming language			■ STL ■ LDR
Arithmetic functions			+, -, *, :, further functions via functional modules
Functional modules			■ CPX diagnostic status ■ Copy CPX diagnostic trace ■ Read CPX module diagnosis ■ Write CPX module parameter ■ ...
No. of programs/tasks			P0 ... P63
LED displays (FEC-specific)			RUN = Program is being executed/Modbus connection active STOP = Program is stopped/no Modbus connection ERR = Error in the program execution TP = Status of the Ethernet connection
Device-specific diagnosis			Module and channel-specific diagnosis via peripherals error
Parameterisation			■ Start-up parameterisation via FST ■ Parameterisation of the operating time via the functional module
Control elements			■ DIL switch for setting the operating mode ■ Rotary switch for program selection/program start
Additional functions			■ Storage of the last 40 errors with timestamp (access via PCP) ■ 8 bit system status in image table for inputs ■ 2 byte inputs and 2 byte outputs, system diagnostics in image table

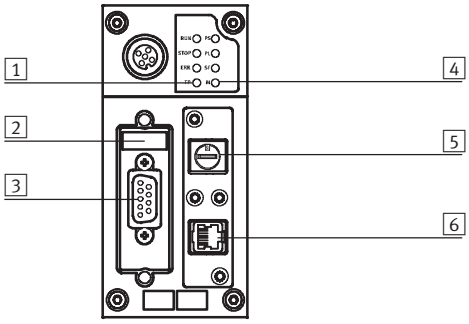
General technical data			
Type			CPX-FEC-1-IE
Part No.			529 041
Operating voltage	Nominal value	[V]	24 DC (reverse polarity protected)
	Permissible range	[V]	18 ... 30 DC
	Power failure buffering	[ms]	10
Residual ripple		[Vss]	4
Current consumption		[mA]	Max. 200
Interference emission			To EN 61000-6-4 (industry)
Interference immunity			To EN 61000-6-2 (industry)
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Material			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 55
Weight	without interlinking block	[g]	140
	incl. interlinking block without power supply	[g]	220
	incl. interlinking block with system supply	[g]	240

Note

Please observe the general limits and guidelines for the system when configuring the electrical modules.

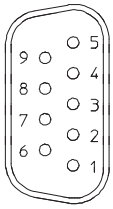
Overview of the operating modes				
	Standalone	Remote controller		Remote I/O
		Ethernet	Fieldbus	
CPX-FEC function	Controller	Controller and communication		Ethernet slave
CPX module controlled by	CPX-FEC	CPX-FEC		Higher-order controller
Pre-processing of data in the FEC	Yes	Yes		No
Communication with higher-order controller	No	Via Ethernet ■ EasyIP ■ Modbus/TCP	Via fieldbus	Via Ethernet ■ EasyIP ■ Modbus/TCP
Web server	Possible	Possible		Possible
Configuration	FST 4.1 or higher	FST 4.1 or higher		Higher-order controller
Parameterisation	Via FST/CPX-MMI	Via FST/CPX-MMI		Via CPX-MMI/Modbus
Order code	T03	T03		T05
Addressing	Changeable	Changeable		Prescribed
Memory	■ 250 kB for user program ■ 550 kB for WEB applications	■ 250 kB for user program ■ 550 kB for WEB applications		■ 800 kB for WEB applications
CPX-MMI	Can be connected to CPX-FEC	Can be connected to CPX-FEC		Can be connected to CPX-FEC

Connection and display components

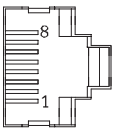


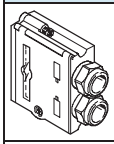
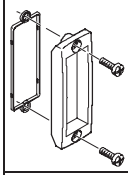
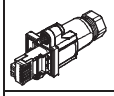
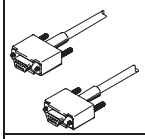
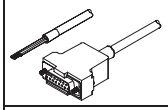
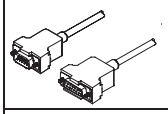
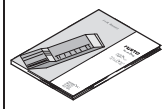
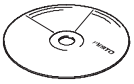
1 Controller and Ethernet LEDs
2 DIL switch for operating mode
3 Programming interface (9-pin Sub-D, socket)
4 CPX-specific status LEDs
5 16-fold rotary switch (program selection)
6 Ethernet connection (8-pin RJ45, socket)

Pin allocation for the programming interface (RS232)

Terminal allocation	Pin	Signal	Designation
Sub-D plug			
	1	n.c.	Not connected
	2	RxD	Received data
	3	TxD-P	Transmitted data
	4	n.c.	Not connected
	5	GND	Data reference potential
	6	n.c.	Not connected
	7	n.c.	Not connected
	8	n.c.	Not connected
	9	n.c.	Not connected
	Housing	Screen	Connection to (FE) functional earth

Pin allocation for the Ethernet interface

Terminal allocation	Pin	Signal	Designation
Plug RJ45			
	1	TD+	Transmitted data+
	2	TD-	Transmitted data-
	3	RD+	Received data+
	4	n.c.	Not connected
	5	n.c.	Not connected
	6	RD-	Received data-
	7	n.c.	Not connected
	8	n.c.	Not connected
	Housing	Screen	Screen

Ordering data				
Designation			Type	Part No.
Bus connection				
	Sub-D plug		**FBS-SUB-9-GS-1x9POL-B**	**534 497**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	RJ45/plug		**FBS-RJ45-8-GS**	**534 494**
	Cover for RJ45 connection		**AK-Rj45**	**534 496**
	Programming cable		**KDI-PPA-3-BU9**	**151 915**
	Connecting cable FED		**FEC-KBG7**	**539 642**
	Connecting cable FED		**FEC-KBG8**	**539 643**
User documentation				
	User documentation for control block CPX-FEC	German	**P.BE-CPX-FEC-DE**	**538 474**
		English	**P.BE-CPX-FEC-EN**	**538 475**
		Spanish	**P.BE-CPX-FEC-ES**	**538 476**
		French	**P.BE-CPX-FEC-FR**	**538 477**
		Italian	**P.BE-CPX-FEC-IT**	**538 478**
		Swedish	**P.BE-CPX-FEC-SV**	**538 479**
Software				
	Programming software	German	**FST4.1DE**	**537 927**
		English	**FST4.1GB**	**537 928**

Terminal CPX

Technical data – Bus node CPX-FB6

Bus node for handling communication between the electrical CPX terminal and a higher-order master via INTERBUS.
The bus node receives system supply from the interlinking block and processes communication via the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via 4 INTERBUS-specific LEDs.

Application

Bus connection

The bus connection is established via a 9-pin Sub-D socket and a 9-pin Sub-D plug with a typical INTERBUS pin allocation.

The bus connector plugs (with protection class IP65/IP67 from Festo or IP20 from other manufacturers) facilitate the connection of the incoming and outgoing bus cable.

The outgoing bus plug contains the typical INTERBUS RBST bridge for identification of the outgoing bus connection.

The Sub-D interfaces are designed for the control of network components with a fibre optic cable connection.

INTERBUS implementation

The CPX-FB6 supports the INTERBUS protocol to EN 50254.
In addition to cyclic I/O exchange, the optional PCP channel can be used for parameterisation and diagnostic functions.
The PCP channel provides access to advanced system information and assigns operation parameters while the controller is running via the user program.

An example of this is access to the integrated diagnostic memory function, i.e. storage of the last 40 errors with timestamp, module, channel and error type.

With its address capacity of 96 inputs and 96 outputs, the CPX-FB6 supports a large number of I/O module configurations, including pneumatic interface.

- - Note

If the PCP channel is used, the maximum number of possible process data bits is reduced by 16.

Special features in combination with CPX-FEC

When a fieldbus node is combined with a CPX-FEC (in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are actuated via the CPX-FEC.
In this case, the fieldbus node only provides the communication interface to the PLC.
Communication between CPX-FEC and CPX fieldbus node takes place via interlinking of the CPX modules.
The CPX-FEC occupies an address capacity of the CPX fieldbus node of:

- 8 byte outputs
- 8 byte inputs

As no other components (e.g. I/O modules) are actuated via the CPX fieldbus node, its address capacity is thus reduced effectively to an 8 byte I/O.

The full address capacity of the CPX-FEC is available for actuation of the peripherals:

- 64 byte inputs
- 64 byte outputs

Terminal CPX

Technical data – Bus node CPX-FB6

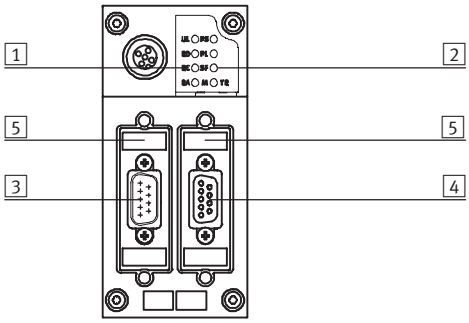
FESTO

General technical data			
Type			**CPX-FB6**
Part No.			**195 748**
Fieldbus interface			Sub-D, 9-pin, socket and pin
Baud rates		[Mbps]	0.5 and 2
Bus type			Remote bus
Ident. code			1, 2 or 3 (configuration-specific) 243 (PCP channel activated)
Profile			12 (I/O device)
PCP channel			Yes, 16 bit (optional via DIL switch)
Configuration support			Icons for CMD software
Max. no. of process data bits	Inputs	[Bit]	96
	Outputs	[Bit]	96
LED displays (bus-specific)			UL = Operating voltage for INTERBUS interface RC = Remotebus check BA = Bus active RD = Remotebus disable TR = Transmit/receive
Device-specific diagnosis			Via peripherals errors
Parameterisation			■ Start-up parameterisation via user functions (CMD) ■ Via PCP communication
Additional functions			■ Storage of the last 40 errors with timestamp (access via PCP) ■ 8 bit system status in image table for inputs ■ 2 byte inputs and 2 byte outputs, system diagnostics in image table
Operating voltage	Nominal value	[V]	24 DC (reverse polarity protected)
	Permissible range	[V]	18 ... 30 DC
	Power failure buffering	[ms]	10
Current consumption		[mA]	Max. 200
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Material			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight	without interlinking block	[g]	125
	incl. interlinking block without power supply	[g]	205
	incl. interlinking block with system supply	[g]	225

Note

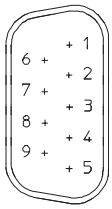
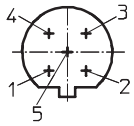
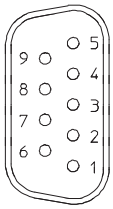
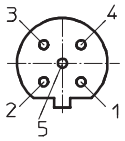
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components



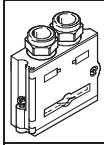
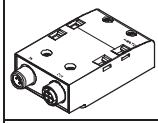
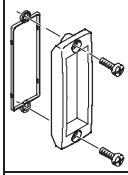
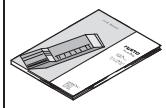
1 INTERBUS-specific LEDs
2 CPX-specific status LEDs
3 Fieldbus connection, incoming (9-pin Sub-D, plug)
4 Fieldbus connection, outgoing (9-pin Sub-D, socket)
5 DIL switch

Pin allocation for the INTERBUS interface

Pin allocation for Sub-D	Pin	Signal	Designation	Pin	Pin allocation for M12
Incoming					
	1	DO1	Data out	1	
	2	DI1	Data in	3	
	3	GND	Reference conductor/earth	5	
	4	n.c.	Not connected	2	
	5	n.c.	Not connected	4	
	6	/DO1	Data out inverse		
	7	/DI1	Data in inverse		
	8	n.c.	Not connected		
	9	n.c.	Not connected		
	Housing	Screen	Connection to FE (functional earth) via R/C combination	Housing	
Outgoing					
	1	DO2	Data out	1	
	2	DI2	Data in	3	
	3	GND	Reference conductor/earth	5	
	4	n.c.	Not connected	2	
	5	+5 V	Station detection[1)]	4	
	6	/DO2	Data out inverse		
	7	/DI2	Data in inverse		
	8	n.c.	Not connected		
	9	RBST	Station detection[1)]		
	Housing	Screen	Connection to FE (functional earth)	Housing	

The incoming interface is electrically isolated from the CPX peripherals. The plug housing is connected to the functional earth FE of the CPX terminal via an R/C combination.

1) The CPX terminal contains the protocol chip SUPI 3 OPC. This ensures automatic detection of additional connected INTERBUS stations. There is therefore no need for a bridge between pin 5 and pin 9.

Ordering data				
Designation			Type	Part No.
Bus connection				
	Sub-D plug	Incoming	**FBS-SUB-9-BU-IB-B**	**532 218**
		Outgoing	**FBS-SUB-9-GS-IB-B**	**532 217**
	Connection block M12 adapter plug (B-coded)		**CPX-AB-2-M12-RK-IB**	**534 505**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
User documentation				
	User documentation for bus node CPX-FB6	German	**P.BE-CPX-FB6-DE**	**526 433**
		English	**P.BE-CPX-FB6-EN**	**526 434**
		Spanish	**P.BE-CPX-FB6-ES**	**526 435**
		French	**P.BE-CPX-FB6-FR**	**526 436**
		Italian	**P.BE-CPX-FB6-IT**	**526 437**
		Swedish	**P.BE-CPX-FB6-SV**	**526 438**

FESTO

DeviceNet

Bus node for handling communication between the electrical CPX terminal and a DeviceNet network.
The bus node receives system supply from the interlinking block and processes communication via the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via the 3 DeviceNet-specific LEDs.

Application

Bus connection

The bus connection can be selected when ordering – either Micro Style as 2xM12 round connectors or OpenStyle as a terminal strip with IP20 protection.

Both connection types have the function of an integrated T-distributor with incoming and outgoing bus line.

DeviceNet implementation

The CPX-FB11 operates with the "Predefined Master/Slave connection set" as a "Group 2 only Server".
The polled I/O, change of state or cyclic method is used for the transmission of cyclic I/O data. The type of transmission can be selected in the network configuration.

The device diagnosis for all bus nodes CPX-FB11 is effectively gathered with strobed I/O and displayed in the input table of the controller.
In addition to cyclic data transmission, acyclic communication is supported through explicit messaging, which allows detailed device diagnosis and parameterisation.

A comprehensive EDS file supports the display of acyclic data. It is also possible to display system information and assign parameters while the controller is running via the user program or the configuration software.

An example of this is access to the integrated diagnostic memory function, i.e. storage of the last 40 errors with timestamp, module, channel and error type.
With its address capacity of 64 byte inputs and 64 byte outputs, the CPX-FB11 supports any configuration of I/O modules, including pneumatic interface.

Special features in combination with CPX-FEC

When a fieldbus node is combined with a CPX-FEC (in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are actuated via the CPX-FEC.
In this case, the fieldbus node only provides the communication interface to the PLC.
Communication between CPX-FEC and CPX fieldbus node takes place via interlinking of the CPX modules.
The CPX-FEC occupies an address capacity of the CPX fieldbus node of:

- 8 byte outputs
- 8 byte inputs

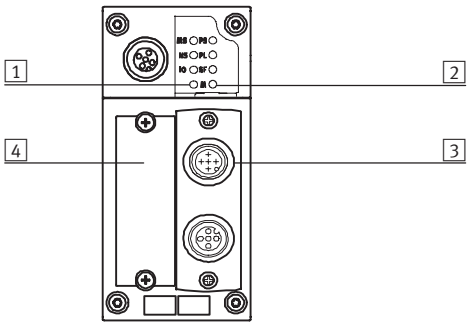
As no other components (e.g. I/O modules) are actuated via the CPX fieldbus node, its address capacity is thus reduced effectively to an 8 byte I/O.

The full address capacity of the CPX-FEC is available for actuation of the peripherals:

- 64 byte inputs
- 64 byte outputs

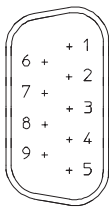
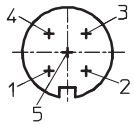
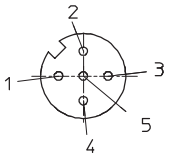
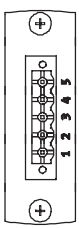
General technical data			
Type			**CPX-FB11**
Part No.			**526 172**
Fieldbus interface			Either ■ MicroStyle bus connection: 2xM12 protection class IP65/IP67 ■ OpenStyle bus connection: 5-pin terminal strip IP20
Baud rates		[kbps]	125, 250, 500
Addressing range			0 ... 63 Set using DIL switch
Product	Type		Communication adapter (12 dec.)
	Code		4554 dec.
Communication types			Polled I/O, change of state/cyclic, strobed I/O and explicit messaging
Configuration support			EDS file and bitmaps
Max. address capacity	Inputs	[Byte]	64
	Outputs	[Byte]	64
LED displays (bus-specific)			MS = Module status NS = Network status IO = I/O status
Device-specific diagnosis			Module and channel-oriented diagnosis through manufacturer-specific diagnosis object
Parameterisation			■ Module and system parameterisation via configuration interface in normal text (EDS) ■ Online in run or program mode
Additional functions			■ Storage of the last 40 errors with timestamp (access via EDS) ■ 8 bit system status in image table for inputs ■ 2 byte inputs and 2 byte outputs, system diagnostics in image table
Operating voltage	Nominal value	[V]	24 DC
	Permissible range	[V]	18 ... 30 DC
	Power failure buffering	[ms]	10
Current consumption		[mA]	Max. 200
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Material			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight	without interlinking block	[g]	120
	incl. interlinking block without power supply	[g]	200
	incl. interlinking block with system supply	[g]	220

Connection and display components

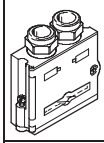
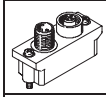
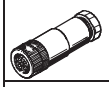
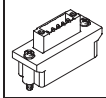
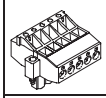
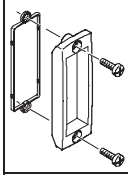
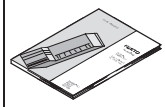


1 Bus-specific LEDs
2 CPX-specific status LEDs
3 Selectable fieldbus connection
Micro Style
Open Style
4 DIL switch cover

Pin allocation for the DeviceNet interface

Terminal allocation	Pin	Signal-specific core colour[1)]	Signal	Designation
Sub-D plug				
	1	–	n.c.	Not connected
	2	blue	CAN_L	Received/transmitted data low
	3	black	0 V bus	0 V CAN interface
	4	–	n.c.	Not connected
	5	blank	Screen	Connection to housing
	6	–	n.c.	Not connected
	7	white	CAN_H	Received/transmitted data high
	8	–	n.c.	Not connected
	9	red	24 V DC bus	24 V DC supply CAN interface
Bus connection Micro Style (M12) incoming/outgoing				
Incoming 	1	blank	Screen	Connection to housing
	2	red	24 V DC bus	24 V DC supply CAN interface
	3	black	0 V bus	0 V CAN interface
	4	white	CAN_H	Received/transmitted data high
	5	blue	CAN_L	Received/transmitted data low
Outgoing 	1	blank	Screen	Connection to housing
	2	red	24 V DC bus	24 V DC supply CAN interface
	3	black	0 V bus	0 V CAN interface
	4	white	CAN_H	Received/transmitted data high
	5	blue	CAN_L	Received/transmitted data low
Bus connection Open Style				
	1	black	0 V bus	0 V CAN interface
	2	blue	CAN_L	Received/transmitted data low
	3	blank	Screen	Connection to housing
	4	white	CAN_H	Received/transmitted data high
	5	red	24 V DC bus	24 V DC supply CAN interface

1) Typical for DeviceNet cables.

Ordering data				
Designation			Type	Part No.
Bus connection				
	Sub-D plug		**FBS-SUB-9-BU-2x5POL-B**	**532 219**
	Bus connection Micro Style, 2xM12		**FBA-2-M12-5POL**	**525 632**
	Socket for Micro Style connection, M12		**FBSD-GD-9-5POL**	**18 324**
	Plug for Micro Style connection, M12		**FBS-M12-5GS-PG9**	**175 380**
	Bus connection Open Style for 5-pin terminal strip		**FBA-1-SL-5POL**	**525 634**
	Bus connection, 5-pin terminal strip		**FBSD-KL-2x5POL**	**525 635**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
User documentation				
	User documentation for bus node CPX-FB11	German	**P.BE-CPX-FB11-DE**	**526 421**
		English	**P.BE-CPX-FB11-EN**	**526 422**
		Spanish	**P.BE-CPX-FB11-ES**	**526 423**
		French	**P.BE-CPX-FB11-FR**	**526 424**
		Italian	**P.BE-CPX-FB11-IT**	**526 425**
		Swedish	**P.BE-CPX-FB11-SV**	**526 426**

Terminal CPX

Technical data – Bus node CPX-FB13

Bus node for handling communication between the electrical CPX terminal and a higher-order master via Profibus DP.
The bus node receives system supply from the interlinking block and processes communication via the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via the Profibus-specific fault LED.

Application

Bus connection

The bus connection is established via a 9-pin Sub-D socket with a typical Profibus allocation (to EN 50170).

The bus connector plug (with protection class IP65/IP67 from Festo or IP20 from other manufacturers) facilitates the connection of an incoming and an outgoing bus cable.

An active bus terminal can be connected using the DIL switch integrated in the plug.

The Sub-D interface is designed for the control of network components with a fibre optic cable connection.

Profibus DP implementation

The CPX-FB13 supports the Profibus DP protocol to EN 50170 Volume 2 for cyclic I/O exchange, parameterisation and diagnostic functions (DPV0).

In addition to DPV0, acyclic communication to the advanced specification DPV1 is supported. DPV1 provides acyclic access to advanced system information and assigns operation parameters while the controller is running via the user program.

An example of this is access to the integrated diagnostic memory function, i.e. storage of the last 40 errors with timestamp, module, channel and error type.

With its address capacity of 64 byte inputs and 64 byte outputs, the CPX-FB13 supports any configuration of I/O modules, including pneumatic interface.

Special features in combination with CPX-FEC

When a fieldbus node is combined with a CPX-FEC (in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are actuated via the CPX-FEC.
In this case, the fieldbus node only provides the communication interface to the PLC.
Communication between CPX-FEC and CPX fieldbus node takes place via interlinking of the CPX modules.
The CPX-FEC occupies an address capacity of the CPX fieldbus node of:

- 8 byte outputs
- 8 byte inputs

As no other components (e.g. I/O modules) are actuated via the CPX fieldbus node, its address capacity is thus reduced effectively to an 8 byte I/O.

The full address capacity of the CPX-FEC is available for actuation of the peripherals:

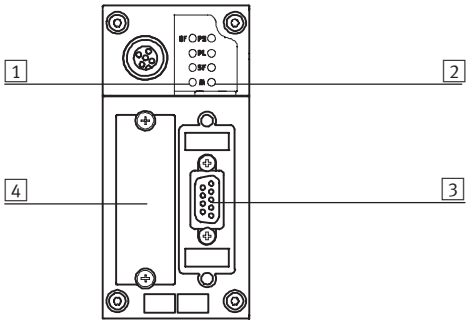
- 64 byte inputs
- 64 byte outputs

General technical data			
Type			**CPX-FB13**
Part No.			**195 740**
Fieldbus interface			Sub-D socket, 9-pin (EN 50170) Electrically isolated 5 V
Baud rates		[Mbps]	0.0096 ... 12
Addressing range			1 ... 125 Set using DIL switch
Product family			4: Valves
Ident. number			0x059E
Communication types			DPV0: Cyclic communication DPV1: Acyclic communication
Configuration support			GSD file and bitmaps
Max. address capacity	Inputs	[Byte]	64
	Outputs	[Byte]	64
LED displays (bus-specific)			BF: Bus Fault
Device-specific diagnosis			Identifier and channel-specific diagnosis to EN 50170 (Profibus standard)
Parameterisation			■ Start-up parameterisation via configuration interface in normal text (GSD) ■ Acyclic parameterisation via DPV1
Additional functions			■ Storage of the last 40 errors with timestamp (access via DPV1) ■ 8 bit system status in image table for inputs ■ 2 byte inputs and 2 byte outputs, system diagnostics in image table
Operating voltage	Nominal value	[V]	24 DC
	Permissible range	[V]	18 ... 30 DC
	Power failure buffering	[ms]	10
Current consumption		[mA]	Max. 200
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Material			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight	without interlinking block	[g]	115
	incl. interlinking block without power supply	[g]	195
	incl. interlinking block with system supply	[g]	215

Note

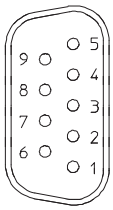
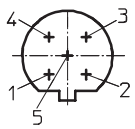
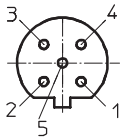
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components

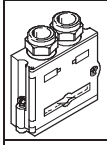
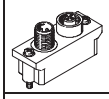
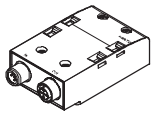
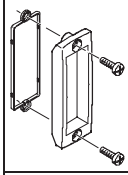
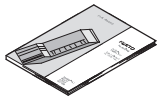


1 Bus status LED / Bus Fault
2 CPX-specific status LED
3 Fieldbus connection (9-pin Sub-D, socket)
4 DIL switch cover

Pin allocation for Profibus DP interface

Terminal allocation	Pin	Signal	Designation
Sub-D plug			
	1	n.c.	Not connected
	2	n.c.	Not connected
	3	RxD/TxD-P	Received/transmitted data P
	4	CNTR-P[1)]	Repeater control signal
	5	DGND	Data reference potential (M5V)
	6	VP	Supply voltage (P5V)
	7	n.c.	Not connected
	8	RxD/TxD-N	Received/transmitted data N
	9	n.c.	Not connected
	Housing	Screen	Connection to housing
Bus connection M12 adapter plug (B-coded)			
Incoming 	1	n.c.	Not connected
	2	RxD/TxD-N	Received/transmitted data N
	3	n.c.	Not connected
	4	RxD/TxD-P	Received/transmitted data P
	5 and M12	Screen	Connection to FE (functional earth)
Outgoing 	1	VP	Supply voltage (P5V)
	2	RxD/TxD-N	Received/transmitted data N
	3	DGND	Data reference potential (M5V)
	4	RxD/TxD-P	Received/transmitted data P
	5 and M12	Screen	Connection to FE (functional earth)

1) The repeater control signal CNTR-P is realised as a TTL signal.

Ordering data				
Designation			Type	Part No.
Bus connection				
	Sub-D plug		**FBS-SUB-9-GS-DP-B**	**532 216**
	Bus connection M12 adapter plug (B-coded)		**FBA-2-M12-5POL-RK**	**533 118**
	Connection block M12 adapter plug (B-coded)		**CPX-AB-2-M12-RK-DP**	**541 519**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
User documentation				
	User documentation for bus node CPX-FB13	German	**P.BE-CPX-FB13-DE**	**526 427**
		English	**P.BE-CPX-FB13-EN**	**526 428**
		Spanish	**P.BE-CPX-FB13-ES**	**526 429**
		French	**P.BE-CPX-FB13-FR**	**526 430**
		Italian	**P.BE-CPX-FB13-IT**	**526 431**
		Swedish	**P.BE-CPX-FB13-SV**	**526 432**

FESTO

CANopen

Bus node for handling communication between the electrical CPX terminal and a CANopen network master or CANopen network.
The bus node receives system supply from the interlinking block and processes communication via the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The different CANopen statuses and the fieldbus communication status are displayed via 3 additional LEDs.

Application

Bus connection

The bus connection is established via a 9-pin Sub-D plug (pin) as per the CAN in Automation (CiA) specification DS 102 with additional 24 V CAN transceiver supply (option as per DS 102).

The bus connector plug (with protection class IP65/IP67 from Festo or IP20 from other manufacturers) facilitates the connection of an incoming and an outgoing bus cable.

There are 4 contacts available for the 4 wires (CAN_L, CAN_H, 24 V, 0 V) of the incoming and outgoing bus cables.

CANopen implementation

The CPX-FB14 supports the CANopen protocol in accordance with the specifications DS 301 V4.01 and DS 401 V2.0.
Implementation is based on the CiA Pre-defined Connection Set.
There are 4 PDOs available for fast I/O data exchange.

Advanced system information can also be accessed by means of SDO communication. SDO communication also facilitates parameterisation before network startup or while the controller is running via the user program.
An example of this is access to the integrated diagnostic memory function, i.e. storage of the last 40 errors with timestamp, module, channel and error type.

With its address capacity, the CPX-FB14 supports a large number of I/O module configurations, including pneumatic interface.
By default, 8 byte digital inputs and 8 byte digital outputs can be addressed via PDO 1.

8 analogue input channels and 8 analogue output channels can be addressed via PDO 2 and 3. Status and diagnostic information can be evaluated via PDO 4.
Additional 8 byte digital inputs and outputs as well as 8 analogue input and output channels can be addressed via mapping.

Special features in combination with CPX-FEC

When a fieldbus node is combined with a CPX-FEC (in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are actuated via the CPX-FEC.
In this case, the fieldbus node only provides the communication interface to the PLC.
Communication between CPX-FEC and CPX fieldbus node takes place via interlinking of the CPX modules.
The CPX-FEC occupies an address capacity of the CPX fieldbus node of:

- 8 byte outputs
- 8 byte inputs

As no other components (e.g. I/O modules) are actuated via the CPX fieldbus node, its address capacity is thus reduced effectively to an 8 byte I/O.

The full address capacity of the CPX-FEC is available for actuation of the peripherals:

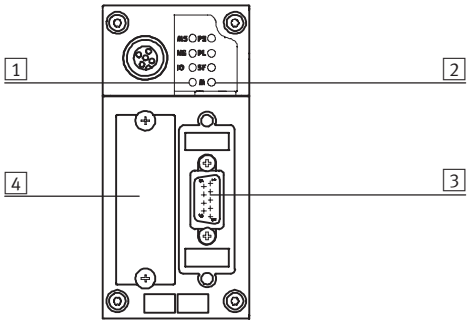
- 64 byte inputs
- 64 byte outputs

General technical data			
Type			**CPX-FB14**
Part No.			**526 174**
Fieldbus interface			Sub-D connector, 9-pin (to DS 102) Bus interface electrically isolated via optocoupler 24 V supply CAN interface via bus
Baud rates		[kbps]	125, 250, 500 and 1000 can be set via DIL switch
Addressing range			Node ID 1 ... 127 Set using DIL switch
Product family			Digital inputs and outputs
Communication profile			DS 301, V4.01
Device profile			DS 401, V2.0
Number	PDO		4 Tx/4 Rx
	SDO		1 server SDO
Configuration support			EDS file and bitmaps
Max. address capacity	Inputs	[Byte]	16 digital, 16 analogue channels
	Outputs	[Byte]	16 digital, 16 analogue channels
LED displays (bus-specific)			MS = Module status NS = Network status IO = I/O status
Device-specific diagnosis			Via emergency message Object 1001, 1002 and 1003
Parameterisation			Via SDO
Additional functions			■ Storage of the last 40 errors with timestamp (access via SDO) ■ 8 bit system status via transmit PDO 4 (default) ■ 2 byte inputs and 2 byte outputs, system diagnostics via PDO 4 ■ Minimum boot-up ■ Variable PDO mapping ■ Emergency message ■ Node guarding ■ Heart beat
Operating voltage	Nominal value	[V]	24 DC
	Permissible range	[V]	18 ... 30 DC
	Power failure buffering	[ms]	10
Current consumption		[mA]	Max. 200
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Material			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight	without interlinking block	[g]	115
	incl. interlinking block without power supply	[g]	195
	incl. interlinking block with system supply	[g]	215

- Note

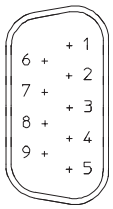
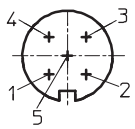
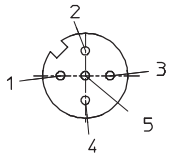
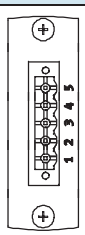
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components

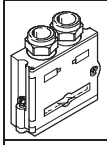
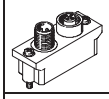
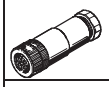
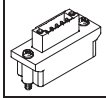
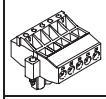
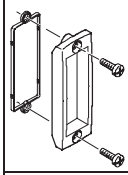
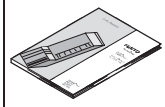


1 Bus-specific LEDs
2 CPX-specific status LED
3 Fieldbus connection (9-pin Sub-D connector)
4 DIL switch cover

Pin allocation for the CANopen interface

Terminal allocation	Pin	Signal	Designation
Sub-D plug			
	1	n.c.	Not connected
	2	CAN_L	Received/transmitted data low
	3	CAN_GND	0 V CAN interface
	4	n.c.	Not connected
	5	CAN_Shld	Optional screened connection
	6	GND	Ground[1]
	7	CAN_H	Received/transmitted data high
	8	n.c.	Not connected
	9	CAN_V+	24 V DC supply CAN interface
	Housing	Screen	Connection to FE (functional earth)
Bus connection Micro Style (M12)			
Incoming 	1	Screen	Connection to FE (functional earth)
	2	CAN_V+	24 V DC supply CAN interface
	3	CAN_GND	0 V CAN interface
	4	CAN_H	Received/transmitted data high
	5	CAN_L	Received/transmitted data low
Outgoing 	1	Screen	Connection to FE (functional earth)
	2	CAN_V+	24 V DC supply CAN interface
	3	CAN_GND	0 V CAN interface
	4	CAN_H	Received/transmitted data high
	5	CAN_L	Received/transmitted data low
Bus connection Open Style			
	1	CAN_GND	0 V CAN interface
	2	CAN_L	Received/transmitted data low
	3	Screen	Connection to FE (functional earth)
	4	CAN_H	Received/transmitted data high
	5	CAN_V+	24 V DC supply CAN interface

1) Connected internally via Pin 3.

Ordering data				
Designation			Type	Part No.
Bus connection				
	Sub-D plug		**FBS-SUB-9-BU-2x5POL-B**	**532 219**
	Bus connection Micro Style (M12)		**FBA-2-M12-5POL**	**525 632**
	Fieldbus socket for Micro Style connection, M12		**FBSD-GD-9-5POL**	**18 324**
	Plug for Micro Style connection, M12		**FBS-M12-5GS-PG9**	**175 380**
	Bus connection Open Style		**FBA-1-SL-5POL**	**525 634**
	Bus connection, 5-pin terminal strip		**FBSD-KL-2x5POL**	**525 635**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
User documentation				
	User documentation for bus node CPX-FB14	German	**P.BE-CPX-FB14-DE**	**526 409**
		English	**P.BE-CPX-FB14-EN**	**526 410**
		Spanish	**P.BE-CPX-FB14-ES**	**526 411**
		French	**P.BE-CPX-FB14-FR**	**526 412**
		Italian	**P.BE-CPX-FB14-IT**	**526 413**
		Swedish	**P.BE-CPX-FB14-SV**	**526 414**

FESTO

CC-Link

Bus node for handling communication between the electrical CPX terminal and a higher-order master for Control & Communication-Link (CC-Link) from Mitsubishi.
The bus node receives system supply from the interlinking block and processes communication via the I/O modules.
The status of the CPX terminal is displayed as a common message via 4 CPX-specific LEDs.
The fieldbus communication status is displayed via 4 CC-Link-specific LEDs.

Application

Bus connection

The bus connection can be selected when ordering and is established by means of a screw terminal with IP20 protection, a Sub-D plug with IP65/IP67 protection from Festo or IP20 protection from other manufacturers.

Both connection types have the function of an integrated T-distributor and thus support the connection of an incoming and outgoing bus cable.

The integrated interface with RS 485 transmission technology is designed for the typical CC-Link 3-wire connection technology (in accordance with CLPA CC-Link Spec. V1.11).

CC-Link implementation

The CPX-FB23 supports max. 4 stations per slave. The number of stations used can be set by means of DIL switch. Cyclic data transmission for digital and analogue I/Os is conducted using the bit and word ranges (Rx/Ry/RWr/RWw).
The CPX-FB23 supports an address space of max. 64 digital inputs and 64 digital outputs (Rx/Ry) or up to 16 analogue inputs and 16 analogue outputs (RWr/RWw). Mixed operation of digital and analogue inputs/outputs is possible.

Example:
Station 1 + 2 = 32 digital inputs and 32 digital outputs
Station 3 = 4 analogue inputs and 4 analogue outputs

Special features in combination with CPX-FEC

When a fieldbus node is combined with a CPX-FEC (in the fieldbus remote controller operating mode), the connected I/Os and/or valves, sensors and actuators are actuated via the CPX-FEC.
In this case, the fieldbus node only provides the communication interface to the PLC.
Communication between CPX-FEC and CPX fieldbus node takes place via interlinking of the CPX modules.
The CPX-FEC occupies an address capacity of the CPX fieldbus node of:

- 8 byte outputs
- 8 byte inputs

As no other components (e.g. I/O modules) are actuated via the CPX fieldbus node, its address capacity is thus reduced effectively to an 8 byte I/O.

The full address capacity of the CPX-FEC is available for actuation of the peripherals:

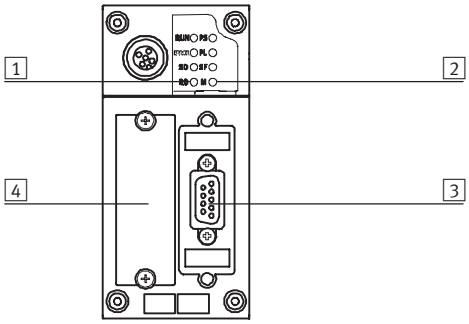
- 64 byte inputs
- 64 byte outputs

General technical data			
Type			**CPX-FB23**
Part No.			**526 176**
Fieldbus interface			Either ■ Sub-D socket, 9-pin ■ Bus connection screw terminal, IP20
Baud rates		[kbps]	156 … 10 000
Addressing range			1 … 64 Set using DIL switch
No. of stations per slave			1, 2, 3 or 4 stations Set using DIL switch
Vendor code			0x0177
Machine type			0x3C
Communication types			Cyclic communication
Configuration support			–
Max. address capacity, inputs	digital		Station 1, 2, 3, 4 = 64 Rx
	analogue		Station 1, 2, 3, 4 = 16 RWr
Max. address capacity, outputs	digital		Station 1, 2, 3, 4 = 64 Ry
	analogue		Station 1, 2, 3, 4 = 16 RWw
LED displays (bus-specific)			RUN = Data communication OK ERROR = CRC error or data communication error SD = Send data RD = Receive data
Device-specific diagnosis			■ 8 bit system status in image table for inputs ■ 2 byte inputs and 2 byte outputs, system diagnostics in image table
Parameterisation			Hold/clear by means of DIL switch
Additional functions			Storage of the last 40 errors with timestamp (access via system diagnostics)
Operating voltage	Nominal value	[V]	24 DC
	Permissible range	[V]	18 … 30 DC
	Power failure buffering	[ms]	10
Current consumption		[mA]	Max. 200
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 … +50
	Storage/transport	[°C]	–20 … +70
Material			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 50
Weight	without interlinking block	[g]	115
	incl. interlinking block without power supply	[g]	195
	incl. interlinking block with system supply	[g]	215

- Note

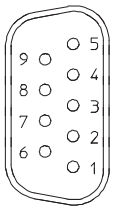
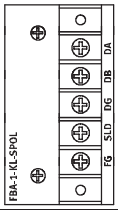
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components

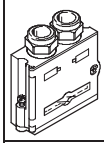
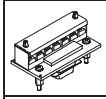
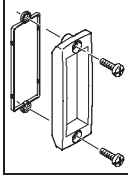
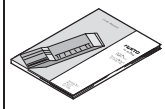


1 Bus-specific status LED
2 CPX-specific status LED
3 Fieldbus connection (9-pin Sub-D, socket)
4 DIL switch cover

Pin allocation for the CC-Link interface

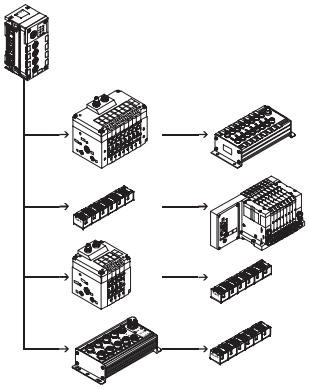
Terminal allocation	Pin	Signal	Designation
Sub-D plug			
	1	n.c.	Not connected
	2	DA	Data A
	3	DG	Data reference potential
	4	n.c.	Not connected
	5	FE[1)]	Functional earth
	6	n.c.	Not connected
	7	DB	Data B
	8	n.c.	Not connected
	9	n.c.	Not connected
	Housing	SLD	Screen
Bus connection screw terminal			
	1	FG	Functional earth/housing
	2	SLD	Screen
	3	DG	Data reference potential
	4	DB	Data B
	5	DA	Data A

1) Via RC element on housing.

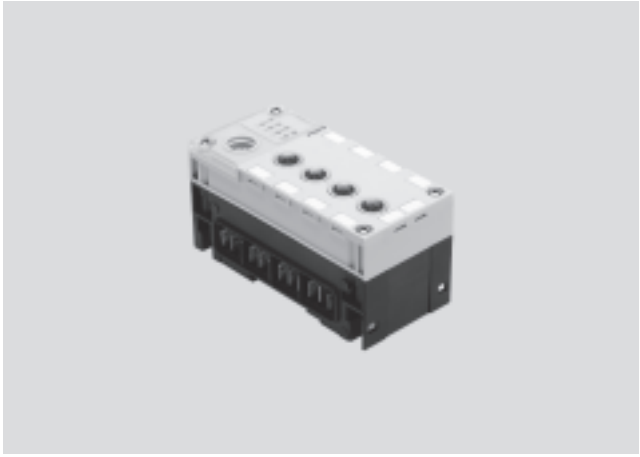
Ordering data				
Designation			Type	Part No.
Bus connection				
	Sub-D plug		**FBS-SUB-9-GS-2x4POL-B**	**532 220**
	Bus connection screw terminal		**FBA-1-KL-5POL**	**197 962**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
User documentation				
	User documentation for bus node CPX-FB23	German	**P.BE-CPX-FB23-DE**	**526 403**
		English	**P.BE-CPX-FB23-EN**	**526 404**

Terminal CPX

Technical data – CPX-CP interface



The CPX-CP electrical interface establishes the connection to CP modules of the CPI installation system via prefabricated cables. The I/O data of the connected valve terminals with CP string extension and CP input and output modules is transferred to the connected CPX bus node and thus via fieldbus to the higher-order controller. This permits the realisation of modular centralised and compact decentralised concepts with one system.
The CP electrical interface is supported by all CPX fieldbus nodes and the CPX-FEC.



Application

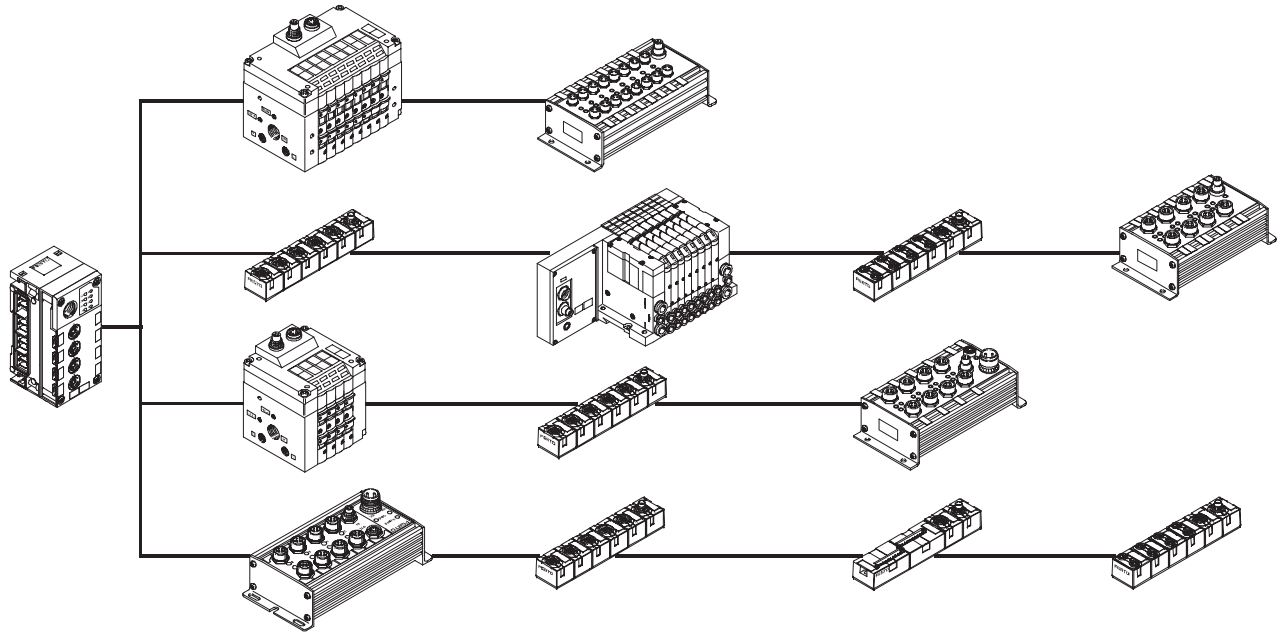
CPI connection

As well as transmitting the communication data, the max. 4 CP strings of a CPX-CP interface also transmit the supply voltage to the connected sensors and the load supply to the valves (or outputs). Both circuits are supplied with 24 V separately from one another, but with a common reference potential. The valve terminals with CP string extension (or outputs) are supplied with voltage for the electronics and valves by the interlinking block.

The following combinations are made possible by the CP interface:

- Centralised analogue and digital inputs and outputs of the CPX terminal
- Decentralised digital inputs and outputs of the CP installation system
- Valve/valve terminals that can be connected both centrally and decentrally

CP interface and CP modules example



Implementation

The CPX-CP interface supports the CPI system:
- Max. 4 individual electronically protected CP strings
- Max. 4 CP modules per string
- Max. 32 inputs/32 outputs per string
- The maximum length of a string is 10 m
- Modules with CPI functionality

The following CP module variants are available:
- Input modules with 8 or 16 digital inputs (connection technology M8, M12 and CageClamp)
- Output modules with 4 or 8 digital outputs (connection technology M12)
- Valve terminals with CP string extension (up to 16 solenoid coils, different valve functions)

CPI modules support the following functions:
- Module-oriented diagnosis
- Module/channel-oriented parameterisation
- Support of all functions by the CPX-MMI operator unit
- Module can be positioned anywhere within the string

Several CP interface modules can be combined in one CPX terminal, depending on the address capacity of the bus node.
Example:
- CPX-FB13 (512 I/O)
- Max. 4 CP interface modules (128 I/O each) possible

Note

When arranging the CP modules it should be noted that CP input modules without CPI functionality should always be placed at the end of a string.

Configuration

The following rules apply for a string of a CPX-CP interface:
- Max. one output module or one valve terminal without CPI functionality
- Max. one output module without CPI functionality or one valve terminal with CP string extension
- Any number of CP modules with CPI functionality, up to the maximum limit of 4 modules and/or 32 inputs/32 outputs per string

Maximum extension:
- 4 input modules and 4 valve terminals/output modules without CPI functionality
- 16 CP modules with CPI functionality

The configuration of the strings with respect to the module type and position of the modules in the string is read in by activating the SAVE key on the CPX-CP interface and saved there remanently (plug and work). Saved data is retained even when the CP interface is isolated from the voltage supply.

The representation of the CP interface within a CPX terminal and thus at the fieldbus is dependent on the characteristics of the relevant fieldbus system. In addition to input and output addressing, this also applies to the representation of the diagnosis and parameterisation of the CP module and the characteristics of the CPI system.

Note

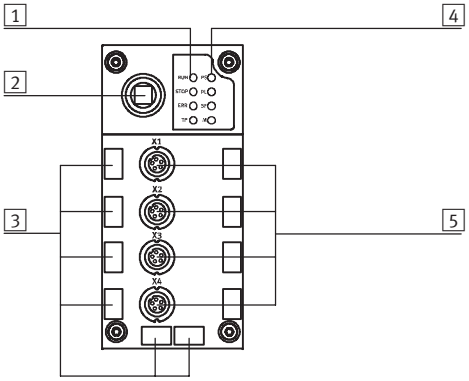
The remanent saving of configuration data means that changes in the configuration or faulty modules are still displayed even after a voltage failure.

General technical data			
Type			**CPX-CP-4-FB**
Part No.			**526 705**
Brief description			CP interface
Max. number of	CP strings		4
	CP modules per string		4
	outputs per string		32
	inputs per string		32
CP connection			Socket M9, 5-pin
Baud rate		[kbps]	1000
Cycle time	CP modules without extended functionality	[ms]	4
	CP modules with extended functionality	[ms]	2
LED displays			L1 ... 4 = Status of the CP string 1 ... 4 PS = Electronic supply, sensor supply PL = Load supply RN = Status of the CP system SF = System error
Device-specific diagnosis			Via bus node
Operating voltage	Nominal value	[V]	24 DC (reverse polarity protected)
	Permissible range	[V]	18 ... 30 DC
	Power failure buffering	[ms]	20
Supply voltage of sensors		[V]	24 DC ±25% coming from bus node
Load voltage of actuators		[V]	24 DC ±10% coming from bus node
Current consumption	without CP modules	[A]	Max. 0.2
	per CP string	[A]	Max. 1.6
Protection class to EN 60529			IP65/IP67
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Material			Polyamide
Grid dimension		[mm]	50
Dimensions (incl. interlinking block) W x L x H		[mm]	50 x 107 x 45
Weight	without interlinking block	[g]	140
	incl. interlinking block without power supply	[g]	220
	incl. interlinking block with system supply	[g]	240

- Note

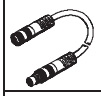
Please observe the general limits and guidelines for the system when configuring the electrical modules.

Connection and display components



1 CP string LEDs
2 SAVE key
3 Holders for inscription labels (IBS 6x10)
4 CPX-specific status LEDs
5 CP connections for up to 4 strings (0 ... 3)

Ordering data

Designation			Type	Part No.
Bus connection				
	Cover cap	M9	**FLANSCHDOSE SER.712**	**356 684**
		M12	**ISK-M12**	**165 592**
	Connecting cable WS-WD	0.25 m	**KVI-CP-3-WS-WD-0,25**	**540 327**
		0.5 m	**KVI-CP-3-WS-WD-0,5**	**540 328**
		2 m	**KVI-CP-3-WS-WD-2**	**540 329**
		5 m	**KVI-CP-3-WS-WD-5**	**540 330**
		8 m	**KVI-CP-3-WS-WD-8**	**540 331**
	Connecting cable GS-GD	2 m	**KVI-CP-3-GS-GD-2**	**540 332**
		5 m	**KVI-CP-3-GS-GD-5**	**540 333**
		8 m	**KVI-CP-3-GS-GD-8**	**540 334**
User documentation				
	User documentation for CPX-CP interface	German	**P.BE-CPX-CP-DE**	**539 293**
		English	**P.BE-CPX-CP-EN**	**539 294**
		Spanish	**P.BE-CPX-CP-ES**	**539 295**
		French	**P.BE-CPX-CP-FR**	**539 296**
		Italian	**P.BE-CPX-CP-IT**	**539 297**
		Swedish	**P.BE-CPX-CP-SV**	**539 298**

Terminal CPX

Technical data – Input module, digital

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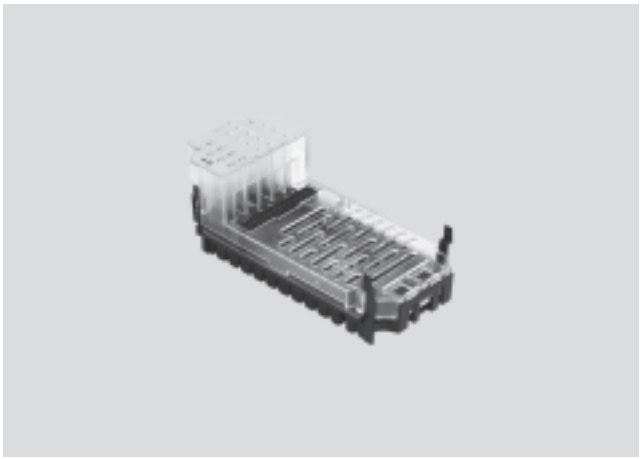
Function

Digital input modules allow the connection of two-wire and three-wire sensors (proximity sensors, inductive or capacitive sensors, etc.).
Depending on the connection block selected, the module supports various connection concepts with different numbers of sockets (single or double allocation).

Applications

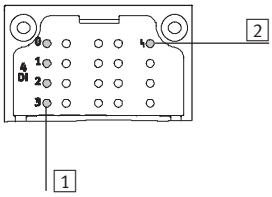
- Input modules for 24 V DC sensor voltage supply
- PNP logic
- Supports connection blocks with M12, M8, Sub-D, Harax and terminal connection
- Module features can be parameterised
- The input module receives the voltage supply for the electronics and the sensors from the interlinking block
- Module protection and diagnosis through integrated electronic fuse protection



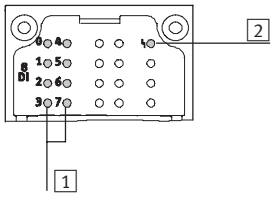
General technical data					
Type			CPX-4DE	CPX-8DE	CPX-8DE-D
Part No.			195 752	195 750	541 480
No. of inputs			4	8	8
Max. power supply	per module	[A]	0.5		
	per channel	[A]	0.5		
Fuse protection			Internal electronic fuse protection for each module	Internal electronic fuse protection for each module	Internal electronic fuse protection for each channel
Module current consumption (input logic level OFF)		[mA]	Typ. 15	Typ. 15	Typ. 12
Supply voltage of sensors		[V]	24 DC ±15%		
Electrical isolation	Channel – Channel		No		
	Channel – Internal bus		No		
Switching level	Signal 0	[V]	≤ 5 DC		
	Signal 1	[V]	≥ 11 DC		
Switch-on debounce time		[ms]	3 (0.1 ms, 10, 20 parameterisable)		
Input characteristic curve			IEC 1131-2		
Switching logic			Positive logic (PNP)		
LED displays	Group diagnosis		1	1	1
	Channel diagnosis		–	–	8
	Channel status		4	8	8
Diagnosis			Short circuit/overload, sensor supply		
Parameterisation			■ Module monitoring ■ Behaviour after short circuit ■ Switch-on debounce time ■ Signal stretching time		
Protection class to EN 60 529			Depending on connection block		
Temperature range	Operation	[°C]	–5 ... +50		
	Storage/transport	[°C]	–20 ... +70		
Materials			Polymer		
Grid dimension		[mm]	50		
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50		
Weight		[g]	38		

Connection and display components

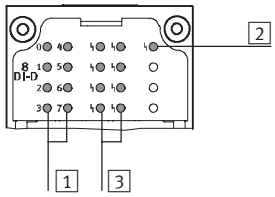
CPX-4DE



CPX-8DE



CPX-8DE-D

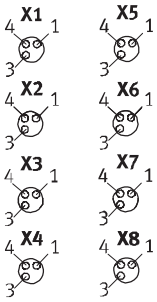
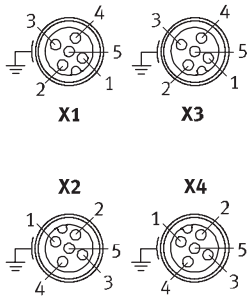


1 Status LEDs (green)
Allocation to inputs
➔ Pin allocation for module
2 Error LED (red, module error)
3 Channel-oriented error LEDs (red)

Connection block/digital input module combinations

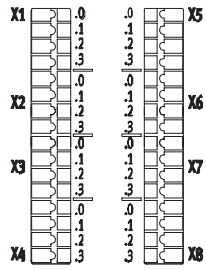
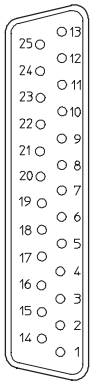
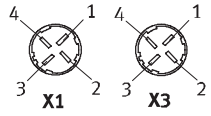
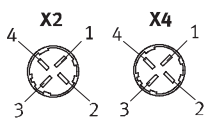
Connection blocks	Part No.	Digital input modules		
		CPX-4DE	CPX-8DE	CPX-8DE-D
CPX-AB-8-M8-3POL	**195 706**	■	■	■
CPX-AB-8-M8X2-4POL	**541 256**	–	–	–
CPX-AB-4-M12X2-5POL	**195 704**	■	■	■
CPX-AB-4-M12X2-5POL-R	**541 254**	■	■	■
CPX-AB-4-M12-8POL	**526 178**	–	–	–
CPX-AB-8-KL-4POL	**195 708**	■	■	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■	■	■
CPX-AB-4-HAR-4POL	**525 636**	■	■	■

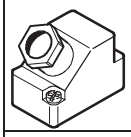
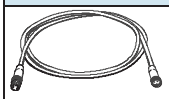
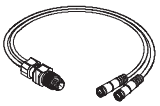
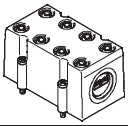
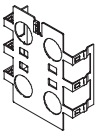
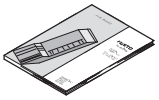
Pin allocation

Inputs, connection block	CPX-4DE		CPX-8DE and CPX-8DE-D	
CPX-AB-8-M8-3POL				
	X1.1: 24 V_{SEN} x X1.3: 0 V_{SEN} x X1.4: Input x X2.1: 24 V_{SEN} x X2.3: 0 V_{SEN} x X2.4: Input x+1 X3.1: 24 V_{SEN} x+1 X3.3: 0 V_{SEN} x+1 X3.4: Input x+1 X4.1: 24 V_{SEN} x+1 X4.3: 0 V_{SEN} x+1 X4.4: n.c.	X5.1: 24 V_{SEN} x+2 X5.3: 0 V_{SEN} x+2 X5.4: Input x+2 X6.1: 24 V_{SEN} x+2 X6.3: 0 V_{SEN} x+2 X6.4: Input x+3 X7.1: 24 V_{SEN} x+3 X7.3: 0 V_{SEN} x+3 X7.4: Input x+3 X8.1: 24 V_{SEN} x+3 X8.3: 0 V_{SEN} x+3 X8.4: n.c.	X1.1: 24 V_{SEN} x X1.3: 0 V_{SEN} x X1.4: Input x X2.1: 24 V_{SEN} x+1 X2.3: 0 V_{SEN} x+1 X2.4: Input x+1 X3.1: 24 V_{SEN} x+2 X3.3: 0 V_{SEN} x+2 X3.4: Input x+2 X4.1: 24 V_{SEN} x+3 X4.3: 0 V_{SEN} x+3 X4.4: Input x+3	X5.1: 24 V_{SEN} x+4 X5.3: 0 V_{SEN} x+4 X5.4: Input x+4 X6.1: 24 V_{SEN} x+5 X6.3: 0 V_{SEN} x+5 X6.4: Input x+5 X7.1: 24 V_{SEN} x+6 X7.3: 0 V_{SEN} x+6 X7.4: Input x+6 X8.1: 24 V_{SEN} x+7 X8.3: 0 V_{SEN} x+7 X8.4: Input x+7
CPX-AB-4-M12X2-5POL and CPX-AB-4-M12X2-5POL-R[1)]				
	X1.1: 24 V_{SEN} x X1.2: Input x+1 X1.3: 0 V_{SEN} x X1.4: Input x X1.5: FE (earth) X2.1: 24 V_{SEN} x+1 X2.2: n.c. X2.3: 0 V_{SEN} x+1 X2.4: Input x+1 X2.5: FE (earth)	X3.1: 24 V_{SEN} x+2 X3.2: Input x+3 X3.3: 0 V_{SEN} x+2 X3.4: Input x+2 X3.5: FE (earth) X4.1: 24 V_{SEN} x+3 X4.2: n.c. X4.3: 0 V_{SEN} x+3 X4.4: Input x+3 X4.5: FE (earth)	X1.1: 24 V_{SEN} X1.2: Input x+1 X1.3: 0 V_{SEN} X1.4: Input x X1.5: FE (earth) X2.1: 24 V_{SEN} X2.2: Input x+3 X2.3: 0 V_{SEN} X2.4: Input x+2 X2.5: FE (earth)	X3.1: 24 V_{SEN} X3.2: Input x+5 X3.3: 0 V_{SEN} X3.4: Input x+4 X3.5: FE (earth) X4.1: 24 V_{SEN} X4.2: Input x+7 X4.3: 0 V_{SEN} X4.4: Input x+6 X4.5: FE (earth)

1) Speedcon quick lock, screen additionally on metal thread

Pin allocation

Inputs, connection block	CPX-4DE		CPX-8DE and CPX-8DE-D	
CPX-AB-8-KL-4POL				
	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input x X1.3: FE (earth) X2.0: 24 V_{SEN} X2.1: 0 V_{SEN} X2.2: Input x+1 X2.3: FE (earth) X3.0: 24 V_{SEN} X3.1: 0 V_{SEN} X3.2: Input x+1 X3.3: FE (earth) X4.0: 24 V_{SEN} X4.1: 0 V_{SEN} X4.2: n.c. X4.3: FE (earth)	X5.0: 24 V_{SEN} X5.1: 0 V_{SEN} X5.2: Input x+2 X5.3: FE (earth) X6.0: 24 V_{SEN} X6.1: 0 V_{SEN} X6.2: Input x+3 X6.3: FE (earth) X7.0: 24 V_{SEN} X7.1: 0 V_{SEN} X7.2: Input x+3 X7.3: FE (earth) X8.0: 24 V_{SEN} X8.1: 0 V_{SEN} X8.2: n.c. X8.3: FE (earth)	X1.0: 24 V_{SEN} x X1.1: 0 V_{SEN} X1.2: Input x X1.3: FE (earth) X2.0: 24 V_{SEN} x+1 X2.1: 0 V_{SEN} X2.2: Input x+1 X2.3: FE (earth) X3.0: 24 V_{SEN} x+2 X3.1: 0 V_{SEN} X3.2: Input x+2 X3.3: FE (earth) X4.0: 24 V_{SEN} x+3 X4.1: 0 V_{SEN} X4.2: Input x+3 X4.3: FE (earth)	X5.0: 24 V_{SEN} x+4 X5.1: 0 V_{SEN} X5.2: Input x+4 X5.3: FE (earth) X6.0: 24 V_{SEN} x+5 X6.1: 0 V_{SEN} X6.2: Input x+5 X6.3: FE (earth) X7.0: 24 V_{SEN} x+6 X7.1: 0 V_{SEN} X7.2: Input x+6 X7.3: FE (earth) X8.0: 24 V_{SEN} x+7 X8.1: 0 V_{SEN} X8.2: Input x+7 X8.3: FE (earth)
CPX-AB-1-SUB-BU-25POL				
	1: Input x 2: Input x+1 3: Input x+1 4: n.c. 5: 24 V_{SEN} 6: 0 V_{SEN} 7: 24 V_{SEN} 8: 0 V_{SEN} 9: 24 V_{SEN} 10: 24 V_{SEN} 11: 0 V_{SEN} 12: 0 V_{SEN} 13: FE (earth)	14: Input x+2 15: Input x+3 16: Input x+3 17: n.c. 18: 24 V_{SEN} 19: 24 V_{SEN} 20: 24 V_{SEN} 21: 24 V_{SEN} 22: 0 V_{SEN} 23: 0 V_{SEN} 24: 0 V_{SEN} 25: FE (earth) Socket: FE (earth)	1: Input x 2: Input x+1 3: Input x+2 4: Input x+3 5: 24 V_{SEN} x+1 6: 0 V_{SEN} 7: 24 V_{SEN} x+3 8: 0 V_{SEN} 9: 24 V_{SEN} x 10: 24 V_{SEN} x+2 11: 0 V_{SEN} 12: 0 V_{SEN} 13: FE (earth)	14: Input x+4 15: Input x+5 16: Input x+6 17: Input x+7 18: 24 V_{SEN} x+4 19: 24 V_{SEN} x+5 20: 24 V_{SEN} x+6 21: 24 V_{SEN} x+7 22: 0 V_{SEN} 23: 0 V_{SEN} 24: 0 V_{SEN} 25: FE (earth) Socket: FE (earth)
CPX-AB-4-HAR-4POL				
 	X1.1: 24 V_{SEN} X1.2: Input x+1 X1.3: 0 V_{SEN} X1.4: Input x X2.1: 24 V_{SEN} X2.2: n.c. X2.3: 0 V_{SEN} X2.4: Input x+1	X3.1: 24 V_{SEN} X3.2: Input x+3 X3.3: 0 V_{SEN} X3.4: Input x+2 X4.1: 24 V_{SEN} X4.2: n.c. X4.3: 0 V_{SEN} X4.4: Input x+3	X1.1: 24 V_{SEN} x X1.2: Input x+1 X1.3: 0 V_{SEN} X1.4: Input x X2.1: 24 V_{SEN} x+2 X2.2: Input x+3 X2.3: 0 V_{SEN} X2.4: Input x+2	X3.1: 24 V_{SEN} x+4 X3.2: Input x+5 X3.3: 0 V_{SEN} X3.4: Input x+4 X4.1: 24 V_{SEN} x+6 X4.2: Input x+7 X4.3: 0 V_{SEN} X4.4: Input x+6

Ordering data				
Designation			Type	Part No.
Plug				
	Plug	M8, solderable	**SEA-GS-M8**	**18 696**
		M8, screw-in	**SEA-3GS-M8-S**	**192 009**
		M12, PG7	**SEA-GS-7**	**18 666**
		M12, PG7, 4-pin for cable ∅ 2.5 mm	**SEA-4GS-7-2,5**	**192 008**
		M12, PG9	**SEA-GS-9**	**18 778**
		M12 for 2 cables	**SEA-GS-11-DUO**	**18 779**
		M12 for 2 cables, 5-pin	**SEA-5GS-11-DUO**	**192 010**
		M12, 5-pin	**SEA-M12-5GS-PG7**	**175 487**
	HARAX plug, 4-pin		**SEA-GS-HAR-4POL**	**525 928**
	Sub-D plug, 25-pin		**SD-SUB-D-ST25**	**527 522**
Cable				
	Connecting cable M8-M8	0.5 m	**KM8-M8-GSGD-0,5**	**175 488**
		1.0 m	**KM8-M8-GSGD-1**	**175 489**
		2.5 m	**KM8-M8-GSGD-2,5**	**165 610**
		5.0 m	**KM8-M8-GSGD-5**	**165 611**
	Connecting cable M8-M12	1.0 m	**KM8-M12-GSGD-1**	**187 859**
		2.5 m	**KM8-M12-GSGD-2,5**	**187 860**
		5.0 m	**KM8-M12-GSGD-5**	**187 861**
	Connecting cable M12-M12	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
		1.0 m	**KM12-M12-GSWD-1-4**	**185 499**
	DUO cable M12	2x straight socket	**KM12-DUO-M8-GDGD**	**18 685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18 688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18 687**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable feeds M9 – 1 cable feed for multi-pin plug		**AK-8KL**	**538 219**
	Fittings kit		**VG-K-M9**	**538 220**
Screening plate				
	Screening plate for M12 connections		**CPX-AB-S-4-M12**	**526 184**
User's manual				
	User's manual	German	**P.BE-CPX-EA-DE**	**526 439**
		English	**P.BE-CPX-EA-EN**	**526 440**
		Spanish	**P.BE-CPX-EA-ES**	**526 441**
		French	**P.BE-CPX-EA-FR**	**526 442**
		Italian	**P.BE-CPX-EA-IT**	**526 443**
		Swedish	**P.BE-CPX-EA-SV**	**526 444**

Terminal CPX

Technical data – Output module, digital

FESTO

Function

Digital outputs control actuators such as individual valves, hydraulic valves, heating controllers and many more. Separate circuits are implemented using an additional power supply. Parallel connection of the outputs of a module allows consuming devices to be controlled with up to 4 A.

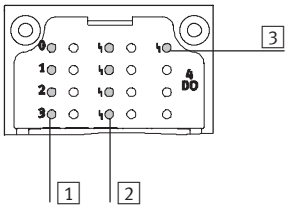
Applications

- Output module for 24 V DC supply voltage
- PNP logic
- Supports connection blocks with M12, M8, Sub-D, Harax and terminal connection
- Module features can be parameterised
- The output module receives the voltage supply for the electronics and the outputs from the interlinking block
- Module protection and diagnosis through integrated electronic fuse protection in each channel

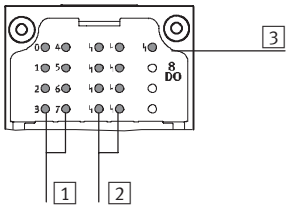
General technical data				
Type			CPX-4DA	CPX-8DA
Part No.			195 754	541 482
No. of outputs			4	8
Max. power supply	per module	[A]	4	
	per channel	[A]	1 (24 W lamp load, 4 channels can be connected in parallel)	0.5 (12 W lamp load, 8 channels can be connected in parallel)
Protection (short circuit)			Internal electronic fuse protection for each channel	
Module current consumption (voltage supply for electronics)		[mA]	Typ. 16	
Supply voltage		[V]	24 DC ±25%	
Electrical isolation	Channel – Channel		No	
	Channel – Internal bus		Yes, using an intermediate supply	
Output characteristic curve			To IEC 1131-2	
Switching logic			Positive logic (PNP)	
LED displays	Group diagnosis		1	1
	Channel diagnosis		4	8
	Channel status		4	8
Diagnosis			■ Short circuit/overload, channel x ■ Load voltage of outputs	
Parameterisation			■ Module monitoring ■ Behaviour after short circuit ■ Failsafe channel x ■ Forcing channel x ■ Idle mode channel x	
Protection class to EN 60 529			Depending on connection block	
Temperature range	Operation	[°C]	–5 ... +50	
	Storage/transport	[°C]	–20 ... +70	
Materials			Polymer	
Grid dimension		[mm]	50	
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50	
Weight		[g]	38	

Connection and display components

CPX-4DA



CPX-8DA

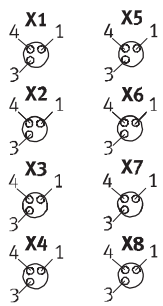


1 Status LEDs (yellow)
Allocation to outputs
➔ Pin allocation for module
2 Channel-oriented error LEDs (red)
3 Error LED (red, module error)

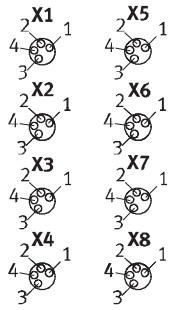
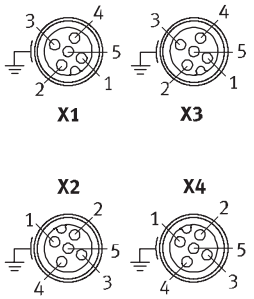
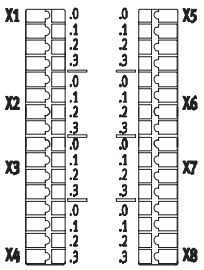
Connection block/digital output module combinations

Connection blocks	Part No.	Digital output module	
		CPX-4DA	CPX-8DA
CPX-AB-8-M8-3POL	**195 706**	■	■
CPX-AB-8-M8X2-4POL	**541 256**	■	■
CPX-AB-4-M12X2-5POL	**195 704**	■	■
CPX-AB-4-M12X2-5POL-R	**541 254**	■	■
CPX-AB-4-M12-8POL	**526 178**	–	–
CPX-AB-8-KL-4POL	**195 708**	■	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■	■
CPX-AB-4-HAR-4POL	**525 636**	■	■

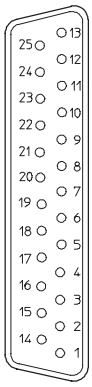
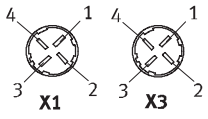
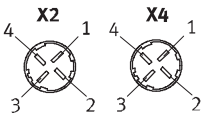
Pin allocation

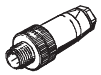
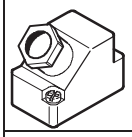
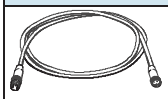
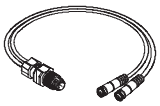
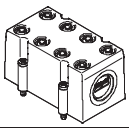
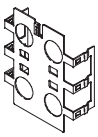
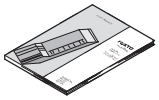
Connection block outputs	CPX-4DA		CPX-8DA	
CPX-AB-8-M8-3POL				
	X1.1: n.c. X1.3: 0 V_{OUT} X1.4: Output x X2.1: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1/X3.4 X3.1: n.c. X3.3: 0 V_{OUT} X3.4: Output x+1/X2.4 X4.1: n.c. X4.3: 0 V_{OUT} X4.4: n.c.	X5.1: n.c. X5.3: 0 V_{OUT} X5.4: Output x+2 X6.1: n.c. X6.3: 0 V_{OUT} X6.4: Output x+3/X7.4 X7.1: n.c. X7.3: 0 V_{OUT} X7.4: Output x+3/X6.4 X8.1: n.c. X8.3: 0 V_{OUT} X8.4: n.c.	X1.1: n.c. X1.3: 0 V_{OUT} X1.4: Output x X2.1: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1 X3.1: n.c. X3.3: 0 V_{OUT} X3.4: Output x+2 X4.1: n.c. X4.3: 0 V_{OUT} X4.4: Output x+3	X5.1: n.c. X5.3: 0 V_{OUT} X5.4: Output x+4 X6.1: n.c. X6.3: 0 V_{OUT} X6.4: Output x+5 X7.1: n.c. X7.3: 0 V_{OUT} X7.4: Output x+6 X8.1: n.c. X8.3: 0 V_{OUT} X8.4: Output x+7

Pin allocation

Connection block outputs	CPX-4DA		CPX-8DA	
CPX-AB-8-M8X2-4POL				
	X1.1: 0 V_{OUT} X1.2: Output x+1/X2.4 X1.3: 0 V_{OUT} X1.4: Output x X2.1: 0 V_{OUT} X2.2: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1/X1.2 X3.1: 0 V_{OUT} X3.2: Output x+3/X4.4 X3.3: 0 V_{OUT} X3.4: Output x+2 X4.1: 0 V_{OUT} X4.2: n.c. X4.3: 0 V_{OUT} X4.4: Output x+3/X3.2	X5.1: 0 V_{OUT} X5.2: n.c. X5.3: 0 V_{OUT} X5.4: n.c. X6.1: 0 V_{OUT} X6.2: n.c. X6.3: 0 V_{OUT} X6.4: n.c. X7.1: 0 V_{OUT} X7.2: n.c. X7.3: 0 V_{OUT} X7.4: n.c. X8.1: 0 V_{OUT} X8.2: n.c. X8.3: 0 V_{OUT} X8.4: n.c.	X1.1: 0 V_{OUT} X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x X2.1: 0 V_{OUT} X2.2: Output x+3 X2.3: 0 V_{OUT} X2.4: Output x+2 X3.1: 0 V_{OUT} X3.2: Output x+5 X3.3: 0 V_{OUT} X3.4: Output x+4 X4.1: 0 V_{OUT} X4.2: Output x+7 X4.3: 0 V_{OUT} X4.4: Output x+6	X5.1: 0 V_{OUT} X5.2: n.c. X5.3: 0 V_{OUT} X5.4: n.c. X6.1: 0 V_{OUT} X6.2: n.c. X6.3: 0 V_{OUT} X6.4: n.c. X7.1: 0 V_{OUT} X7.2: n.c. X7.3: 0 V_{OUT} X7.4: n.c. X8.1: 0 V_{OUT} X8.2: n.c. X8.3: 0 V_{OUT} X8.4: n.c.
CPX-AB-4-M12X2-5POL and CPX-AB-4-M12X2-5POL-R[1)]				
	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x X1.5: FE (earth) X2.1: n.c. X2.2: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1 X2.5: FE (earth)	X3.1: n.c. X3.2: Output x+3 X3.3: 0 V_{OUT} X3.4: Output x+2 X3.5: FE (earth) X4.1: n.c. X4.2: n.c. X4.3: 0 V_{OUT} X4.4: Output x+3 X4.5: FE (earth)	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x X1.5: FE (earth) X2.1: n.c. X2.2: Output x+3 X2.3: 0 V_{OUT} X2.4: Output x+2 X2.5: FE (earth)	X3.1: n.c. X3.2: Output x+5 X3.3: 0 V_{OUT} X3.4: Output x+4 X3.5: FE (earth) X4.1: n.c. X4.2: Output x+7 X4.3: 0 V_{OUT} X4.4: Output x+6 X4.5: FE (earth)
CPX-AB-8-KL-4POL				
	X1.0: n.c. X1.1: 0 V_{OUT} X1.2: Output x X1.3: FE (earth) X2.0: n.c. X2.1: 0 V_{OUT} X2.2: Output x+1 X2.3: FE (earth) X3.0: n.c. X3.1: 0 V_{OUT} X3.2: Output x+1 X3.3: FE (earth) X4.0: n.c. X4.1: 0 V_{OUT} X4.2: n.c. X4.3: FE (earth)	X5.0: n.c. X5.1: 0 V_{OUT} X5.2: Output x+2 X5.3: FE (earth) X6.0: n.c. X6.1: 0 V_{OUT} X6.2: Output x+3 X6.3: FE (earth) X7.0: n.c. X7.1: 0 V_{OUT} X7.2: Output x+3 X7.3: FE (earth) X8.0: n.c. X8.1: 0 V_{OUT} X8.2: n.c. X8.3: FE (earth)	X1.0: n.c. X1.1: 0 V_{OUT} X1.2: Output x X1.3: FE (earth) X2.0: n.c. X2.1: 0 V_{OUT} X2.2: Output x+1 X2.3: FE (earth) X3.0: n.c. X3.1: 0 V_{OUT} X3.2: Output x+2 X3.3: FE (earth) X4.0: n.c. X4.1: 0 V_{OUT} X4.2: Output x+3 X4.3: FE (earth)	X5.0: n.c. X5.1: 0 V_{OUT} X5.2: Output x+4 X5.3: FE (earth) X6.0: n.c. X6.1: 0 V_{OUT} X6.2: Output x+5 X6.3: FE (earth) X7.0: n.c. X7.1: 0 V_{OUT} X7.2: Output x+6 X7.3: FE (earth) X8.0: n.c. X8.1: 0 V_{OUT} X8.2: Output x+7 X8.3: FE (earth)

1) Speedcon quick lock, screen additionally on metal thread

Pin allocation				
Connection block outputs	CPX-4DA		CPX-8DA	
CPX-AB-1-SUB-BU-25POL				
	1: Output x 2: Output x+1 3: Output x+1 4: n.c. 5: n.c. 6: 0 V_{OUT} 7: n.c. 8: 0 V_{OUT} 9: n.c. 10: n.c. 11: 0 V_{OUT} 12: 0 V_{OUT} 13: FE (earth)	14: Output x+2 15: Output x+3 16: Output x+3 17: n.c. 18: n.c. 19: n.c. 20: n.c. 21: n.c. 22: 0 V_{OUT} 23: 0 V_{OUT} 24: 0 V_{OUT} 25: FE (earth) Socket: FE (earth)	1: Output x 2: Output x+1 3: Output x+2 4: Output x+3 5: n.c. 6: 0 V_{OUT} 7: n.c. 8: 0 V_{OUT} 9: n.c. 10: n.c. 11: 0 V_{OUT} 12: 0 V_{OUT} 13: FE (earth)	14: Output x+4 15: Output x+5 16: Output x+6 17: Output x+7 18: n.c. 19: n.c. 20: n.c. 21: n.c. 22: 0 V_{OUT} 23: 0 V_{OUT} 24: 0 V_{OUT} 25: FE (earth) Socket: FE (earth)
CPX-AB-4-HAR-4POL				
	X1.1: n.c. X1.2: Output x+1/X2.4 X1.3: 0 V_{OUT} X1.4: Output x	X3.1: n.c. X3.2: Output x+3/X4.4 X3.3: 0 V_{OUT} X3.4: Output x+2	X1.1: n.c. X1.2: Output x+1 X1.3: 0 V_{OUT} X1.4: Output x	X3.1: n.c. X3.2: Output x+5 X3.3: 0 V_{OUT} X3.4: Output x+4
	X2.1: n.c. X2.2: n.c. X2.3: 0 V_{OUT} X2.4: Output x+1/X1.2	X4.1: n.c. X4.2: n.c. X4.3: 0 V_{OUT} X4.4: Output x+3/X3.2	X2.1: n.c. X2.2: Output x+3 X2.3: 0 V_{OUT} X2.4: Output x+2	X4.1: n.c. X4.2: Output x+7 X4.3: 0 V_{OUT} X4.4: Output x+6

Ordering data				
Designation			Type	Part No.
Plug				
	Plug	M8, solderable	**SEA-GS-M8**	**18 696**
		M8, screw-in	**SEA-3GS-M8-S**	**192 009**
		M12, PG7	**SEA-GS-7**	**18 666**
		M12, PG7, 4-pin for cable ∅ 2.5 mm	**SEA-4GS-7-2,5**	**192 008**
		M12, PG9	**SEA-GS-9**	**18 778**
		M12 for 2 cables	**SEA-GS-11-DUO**	**18 779**
		M12 for 2 cables, 5-pin	**SEA-5GS-11-DUO**	**192 010**
		M12, 5-pin	**SEA-M12-5GS-PG7**	**175 487**
	HARAX plug, 4-pin		**SEA-GS-HAR-4POL**	**525 928**
	Sub-D plug, 25-pin		**SD-SUB-D-ST25**	**527 522**
Cable				
	Connecting cable M8-M8	0.5 m	**KM8-M8-GSGD-0,5**	**175 488**
		1.0 m	**KM8-M8-GSGD-1**	**175 489**
		2.5 m	**KM8-M8-GSGD-2,5**	**165 610**
		5.0 m	**KM8-M8-GSGD-5**	**165 611**
	Connecting cable M8-M12	1.0 m	**KM8-M12-GSGD-1**	**187 859**
		2.5 m	**KM8-M12-GSGD-2,5**	**187 860**
		5.0 m	**KM8-M12-GSGD-5**	**187 861**
	Connecting cable M12-M12	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
		1.0 m	**KM12-M12-GSWD-1-4**	**185 499**
	DUO cable M12	2x straight socket	**KM12-DUO-M8-GDGD**	**18 685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18 688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18 687**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable feeds M9 – 1 cable feed for multi-pin plug		**AK-8KL**	**538 219**
	Fittings kit		**VG-K-M9**	**538 220**
Screening plate				
	Screening plate for M12 connections		**CPX-AB-S-4-M12**	**526 184**
User's manual				
	User's manual	German	**P.BE-CPX-EA-DE**	**526 439**
		English	**P.BE-CPX-EA-EN**	**526 440**
		Spanish	**P.BE-CPX-EA-ES**	**526 441**
		French	**P.BE-CPX-EA-FR**	**526 442**
		Italian	**P.BE-CPX-EA-IT**	**526 443**
		Swedish	**P.BE-CPX-EA-SV**	**526 444**

Terminal CPX

Technical data – Input/output module, digital

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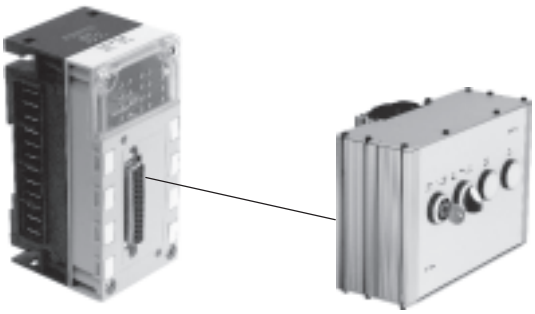
Applications

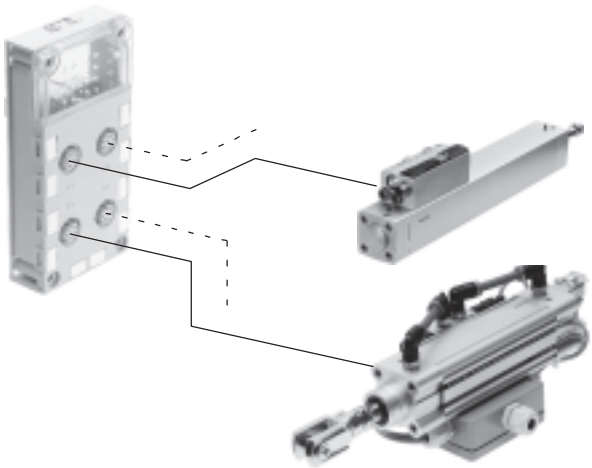
- Digital multi I/O module for 24 V DC supply voltage
- Supports connection blocks with Sub-D, terminal connection and M12 connection (8-pin)
- Module features can be parameterised
- The inputs receive the voltage supply for the electronics and the sensors from the interlinking block
- The outputs receive the voltage supply for the electronics and outputs from the interlinking block
- Module protection and diagnosis through integrated electronic fuse protection for the sensor power supply and integrated electronic fuse protection in each output channel

Function



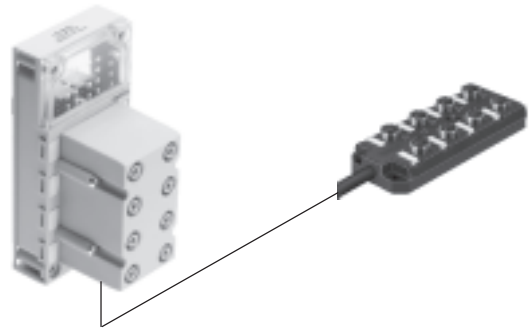
The multi I/O module controls devices with a high number of inputs and outputs per connection point.
Because the module supports Sub-D connection blocks, consoles with pushbuttons and lamps can be connected to the CPX terminal using a minimal amount of installation space.

Up to 8 inputs and outputs can be connected to a connection point with IP65 protection.



Support for the M12 connection block (8-pin) means that up to 4 cylinder-valve combinations with integrated sensors can be connected. 2 inputs and 2 outputs per socket are supported for each cylinder-valve combination. It is therefore possible to control max. 2 solenoid coils and operate 2 sensors with a pre-assembled cable.

Two inputs on two sockets are bridged to provide support for the diagnostic module of the cylinder-valve combination. This effectively means that there are 3 inputs and 2 outputs available on 2 sockets.



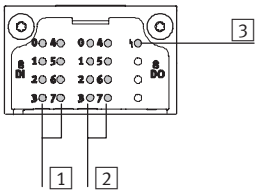
As an alternative to the Sub-D and M12 connection block (8-pin) for installation with IP65 protection, the terminal connection block produces an identical result for installation with IP20 protection – or with IP65/67 protection with additional cover.

Subordinate I/O modules with multi-pin plug connection (Sub-D plug or multi-pin cable for self-assembly) support the cost-effective and space-saving integration of critical installation areas such as chain link trunking or upstream functions.

General technical data			
Type			**CPX-8DE-8DA**
Part No.			**526 257**
Number	Inputs		8
	Outputs		8
Max. power supply per module	Sensor supply	[A]	0.5
	Outputs	[A]	4
Max. power supply per channel	Sensor supply	[A]	0.5
	Outputs	[A]	0.5
Max. power supply per channel		[A]	0.5 (24 W lamp load, 4 channels can be connected in parallel)
Fuse protection	Sensor supply		Internal electronic fuse protection for sensor supply
	Outputs		Internal electronic fuse protection for each channel
Internal electronics current consumption	Inputs	[mA]	Typically 22
	Outputs	[mA]	Typically 34
Supply voltage	Sensors	[V]	24 DC ±25%
	Outputs	[V]	24 DC ±25%
Electrical isolation, inputs	Channel – Channel		No
	Channel – Internal bus		No
Electrical isolation, outputs	Channel – Channel		No
	Channel – Internal bus		Yes, using an intermediate supply
Characteristic curve	Inputs		IEC 1131-2
	Outputs		To IEC 1131-2
Switching level, inputs	Signal 0	[V]	≤ 5 DC
	Signal 1	[V]	≥ 11 DC
Switch-on debounce time		[ms]	3 (0.1, 10, 20 parameterisable)
Switching logic			Positive logic (PNP)
LED displays	Group diagnosis		1
	Channel diagnosis		–
	Channel status		16
Diagnosis	Inputs		■ Short circuit/overload, sensor supply
	Outputs		■ Short circuit/overload, output channel x ■ Load voltage of outputs
Parameterisation	Inputs		■ Module monitoring ■ Behaviour after short circuit, sensor supply ■ Switch-on debounce time ■ Signal stretching time, inputs
	Outputs		■ Behaviour after short circuit ■ Failsafe channel x ■ Forcing channel x ■ Idle mode channel x
Protection class to EN 60 529			Depending on connection block
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	38

Connection and display components

CPX-8DE-8DA



1 Status LEDs (green)
Allocation to inputs
➔ Pin allocation for module

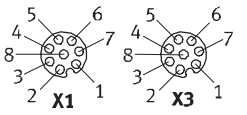
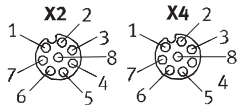
2 Status LEDs (yellow)
Allocation to outputs
➔ Pin allocation for module

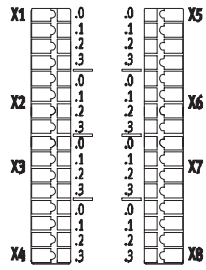
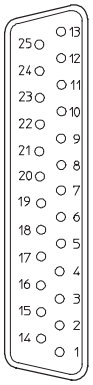
3 Error LED (red)
(module error)

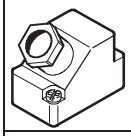
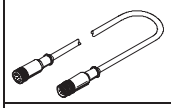
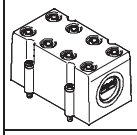
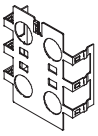
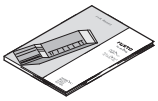
Connection block/digital input/output module combinations

Connection blocks	Part No.	Digital I/O module
		CPX-8DE-8DA
CPX-AB-8-M8-3POL	**195 706**	–
CPX-AB-8-M8X2-4POL	**541 256**	–
CPX-AB-4-M12X2-5POL	**195 704**	–
CPX-AB-4-M12X2-5POL-R	**541 254**	–
CPX-AB-4-M12-8POL	**526 178**	■
CPX-AB-8-KL-4POL	**195 708**	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■
CPX-AB-4-HAR-4POL	**525 636**	–

Pin allocation

Connection block inputs/outputs	CPX-8DE-8DA	
CPX-AB-4-M12-8POL		
	X1.1: 24 V_{SEN}	X3.1: 24 V_{SEN}
	X1.2: Input x	X3.2: Input x+4
	X1.3: Input x+1	X3.3: Input x+5
	X1.4: 0 V_{SEN}	X3.4: 0 V_{SEN}
	X1.5: Output x	X3.5: Output x+4
	X1.6: Output x+1	X3.6: Output x+5
	X1.7: Input x+4	X3.7: n.c.
	X1.8: 0 V_{OUT}	X3.8: 0 V_{OUT}
	X2.1: 24 V_{SEN}	X4.1: 24 V_{SEN}
	X2.2: Input x+2	X4.2: Input x+6
	X2.3: Input x+3	X4.3: Input x+7
	X2.4: 0 V_{SEN}	X4.4: 0 V_{SEN}
	X2.5: Output x+2	X4.5: Output x+6
	X2.6: Output x+3	X4.6: Output x+7
	X2.7: Input x+6	X4.7: n.c.
	X2.8: 0 V_{OUT}	X4.8: 0 V_{OUT}

Pin allocation		
Connection block inputs/outputs	CPX-8DE-8DA	
CPX-AB-8-KL-4POL		
	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input x X1.3: FE (earth) X2.0: Input x+4 X2.1: Input x+5 X2.2: Input x+1 X2.3: FE (earth) X3.0: 24 V_{SEN} X3.1: 0 V_{SEN} X3.2: Input x+2 X3.3: FE (earth) X4.0: Input x+6 X4.1: Input x+7 X4.2: Input x+3 X4.3: FE (earth)	X5.0: Output x+4 X5.1: 0 V_{OUT} X5.2: Output x X5.3: FE (earth) X6.0: Output x+5 X6.1: 0 V_{OUT} X6.2: Output x+1 X6.3: FE (earth) X7.0: Output x+6 X7.1: 0 V_{OUT} X7.2: Output x+2 X7.3: FE (earth) X8.0: Output x+7 X8.1: 0 V_{OUT} X8.2: Output x+3 X8.3: FE (earth)
CPX-AB-1-SUB-BU-25POL		
	1: Input x 2: Input x+1 3: Input x+2 4: Input x+3 5: Input x+4 6: Input x+5 7: Input x+6 8: Input x+7 9: 24 V_{SEN} 10: 24 V_{SEN} 11: 0 V_{SEN} 12: 0 V_{SEN} 13: FE (earth)	14: Output x 15: Output x+1 16: Output x+2 17: Output x+3 18: Output x+4 19: Output x+5 20: Output x+6 21: Output x+7 22: 0 V_{OUT} 23: 0 V_{OUT} 24: 0 V_{OUT} 25: FE (earth) Socket: FE (earth)

Ordering data				
Designation			Type	Part No.
Plug				
	Sub-D plug, 25-pin		**SD-SUB-D-ST25**	**527 522**
Cable				
	Connecting cable M12		**KM12-8GD8GS-2-PU**	**525 617**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable feeds M9 – 1 cable feed for multi-pin plug		**AK-8KL**	**538 219**
	Fittings kit		**VG-K-M9**	**538 220**
Screening plate				
	Screening plate for M12 connections		**CPX-AB-S-4-M12**	**526 184**
User's manual				
	User's manual	German	**P.BE-CPX-EA-DE**	**526 439**
		English	**P.BE-CPX-EA-EN**	**526 440**
		Spanish	**P.BE-CPX-EA-ES**	**526 441**
		French	**P.BE-CPX-EA-FR**	**526 442**
		Italian	**P.BE-CPX-EA-IT**	**526 443**
		Swedish	**P.BE-CPX-EA-SV**	**526 444**

Terminal CPX

Technical data – Analogue module for inputs

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Function

Analogue modules control devices with a standard analogue interface such as pressure switches, temperature, flow rate, filling level, etc. Depending on the connection block selected, the analogue module supports various connection concepts with different numbers of sockets or clamps.

Applications

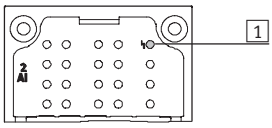
- Analogue module for 0 ... 10 V, 0 ... 20 mA or 4 ... 20 mA
- Supports connection blocks with M12, Sub-D and terminal connection
- Analogue module features can be parameterised
- Different data formats available
- Operation with and without electrical isolation possible
- The analogue module receives the voltage supply for the electronics and the sensors from the interlinking block
- Analogue module protection and diagnosis through integrated electronic fuse protection

General technical data				
Type		CPX-2AE-U-I		CPX-4AE-I
Part No.		526 168		541 484
		Voltage input	Current input	Current input
No. of analogue inputs		2		Choice of 2 or 4
Max. power supply per module	[A]	0.7		
Fuse protection		Internal electronic fuse protection for sensor supply		
Current consumption from 24 V sensor supply (quiescent current)	[mA]	Typically 50		
Current consumption from 24 V sensor supply (at full load)	[A]	Max. 0.7		
Supply voltage of sensors	[V]	24 DC ±25%		
Signal range (parameterisable for each channel by means of DIL switch or software)		0 ... 10 V DC	0 ... 20 mA 4 ... 20 mA	0 ... 20 mA 4 ... 20 mA
Resolution		12 bit		
No. of units		4096		
Absolute accuracy	[%]	±0.5	±0.6	±0.6
Linearity errors (no software scaling)	[%]	±0.05	±0.05	±0.05
Repetition accuracy (at 25 °C)	[%]	0.15	0.15	0.15
Input resistance		100 kΩ	≤ 100 Ω	≤ 100 Ω
Max. permissible input voltage	[V]	30 DC	–	–
Max. permissible input current	[mA]	–	40	40
Conversion time per channel	[µs]	Typically 150		
Cycle time (module)	[ms]	≤ 4		≤ 10

General technical data				
Type			CPX-2AE-U-I	CPX-4AE-I
Part No.			526 168	541 484
Data format			Prefix + 15 bit, linear scaling Prefix +12 bit right-justified, type 03 compatible Prefix + 15 bit left-aligned, S7 compatible Prefix + 12 bit left-aligned + diagnosis, S5 compatible	
Line length			Max. 30 m (screened)	
Electrical isolation	Channel – Channel		No	
	Channel – Internal bus		Yes, with external sensor supply	
	Channel – Sensor supply		Yes, with external sensor supply	
LED displays	Group diagnosis		1	
	Channel diagnosis		Yes, by means of flashing frequency of group diagnosis	
Diagnosis			■ Short circuit/overload, sensor supply ■ Parameterisation errors ■ Value falling below nominal range/full-scale value ■ Value exceeding nominal range/full-scale value ■ Wire break (with measuring range 4 … 20 mA)	
Parameterisation			■ Short circuit monitoring, sensor supply ■ Behaviour after short circuit, sensor supply ■ Data format ■ Lower limit value/full-scale value ■ Upper limit value/full-scale value ■ Monitoring of value falling below nominal range/full-scale value ■ Monitoring of value exceeding nominal range/full-scale value ■ Monitoring of wire break (with measuring range 4 … 20 mA) ■ Signal range ■ Measured value smoothing	
Protection class to EN 60 529			Depending on connection block	
Temperature range	Operation	[°C]	–5 … +50	
	Storage/transport	[°C]	–20 … +70	
Materials			Polymer	
Grid dimension		[mm]	50	
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50	
Weight		[g]	38	

Connection and display components

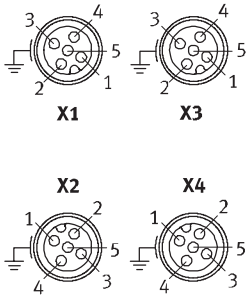
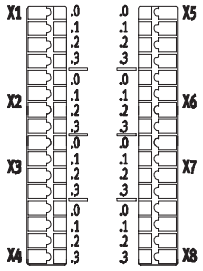
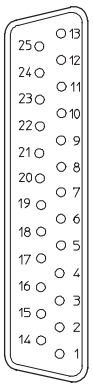
CPX-2AE-U-I and CPX-4AE-I



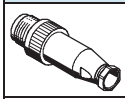
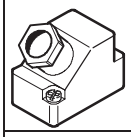
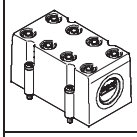
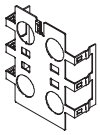
1 Error LED (red, module error)

Connection block/analogue module combinations			
Connection blocks	Part No.	Analogue module	
		CPX-2AE-U-I	CPX-4AE-I
CPX-AB-8-M8-3POL	**195 706**	–	–
CPX-AB-8-M8X2-4POL	**541 256**	–	–
CPX-AB-4-M12X2-5POL	**195 704**	■	■
CPX-AB-4-M12X2-5POL-R	**541 254**	■	■
CPX-AB-4-M12-8POL	**526 178**	–	–
CPX-AB-8-KL-4POL	**195 708**	■	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■	■
CPX-AB-4-HAR-4POL	**525 636**	–	–

Pin allocation

Connection block inputs	CPX-2AE-U-I		CPX-4AE-I	
CPX-AB-4-M12X2-5POL and CPX-AB-4-M12X2-5POL-R[1]				
	X1.1: 24 V_{SEN} X1.2: Input U0+ X1.3: 0 V_{SEN} X1.4: Input U0– X1.5: FE (earth)[2]	X3.1: 24 V_{SEN} X3.2: Input U1+ X3.3: 0 V_{SEN} X3.4: Input U1– X3.5: FE (earth)[2]	X1.1: 24 V_{SEN} X1.2: Input I0+ X1.3: 0 V_{SEN} X1.4: Input I0– X1.5: FE (earth)[2]	X3.1: 24 V_{SEN} X3.2: Input I2+ X3.3: 0 V_{SEN} X3.4: Input I2– X3.5: FE (earth)[2]
	X2.1: 24 V_{SEN} X2.2: Input I0+ X2.3: 0 V_{SEN} X2.4: Input I0– X2.5: FE (earth)[2]	X4.1: 24 V_{SEN} X4.2: Input I1+ X4.3: 0 V_{SEN} X4.4: Input I1– X4.5: FE (earth)[2]	X2.1: 24 V_{SEN} X2.2: Input I1+ X2.3: 0 V_{SEN} X2.4: Input I1– X2.5: FE (earth)[2]	X4.1: 24 V_{SEN} X4.2: Input I3+ X4.3: 0 V_{SEN} X4.4: Input I3– X4.5: FE (earth)[2]
CPX-AB-8-KL-4POL				
	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input U0– X1.3: FE (earth) X2.0: n.c. X2.1: n.c. X2.2: Input U0+ X2.3: FE (earth) X3.0: 24 V_{SEN} X3.1: 0 V_{SEN} X3.2: Input I0– X3.3: FE (earth) X4.0: n.c. X4.1: n.c. X4.2: Input I0+ X4.3: FE (earth)	X5.0: 24 V_{SEN} X5.1: 0 V_{SEN} X5.2: Input U1– X5.3: FE (earth) X6.0: n.c. X6.1: n.c. X6.2: Input U1+ X6.3: FE (earth) X7.0: 24 V_{SEN} X7.1: 0 V_{SEN} X7.2: Input I1– X7.3: FE (earth) X8.0: n.c. X8.1: n.c. X8.2: Input I1+ X8.3: FE (earth)	X1.0: 24 V_{SEN} X1.1: 0 V_{SEN} X1.2: Input I0– X1.3: FE (earth) X2.0: n.c. X2.1: n.c. X2.2: Input I0+ X2.3: FE (earth) X3.0: 24 V_{SEN} X3.1: 0 V_{SEN} X3.2: Input I1– X3.3: FE (earth) X4.0: n.c. X4.1: n.c. X4.2: Input I1+ X4.3: FE (earth)	X5.0: 24 V_{SEN} X5.1: 0 V_{SEN} X5.2: Input I2– X5.3: FE (earth) X6.0: n.c. X6.1: n.c. X6.2: Input I2+ X6.3: FE (earth) X7.0: 24 V_{SEN} X7.1: 0 V_{SEN} X7.2: Input I3– X7.3: FE (earth) X8.0: n.c. X8.1: n.c. X8.2: Input I3+ X8.3: FE (earth)
CPX-AB-1-SUB-BU-25POL				
	1: Input U0– 2: Input U0+ 3: Input I0– 4: Input I1+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V_{SEN} 10: 24 V_{SEN} 11: 0 V_{SEN} 12: 0 V_{SEN} 13: Screen[3]	14: Input U1– 15: Input U1+ 16: Input I1– 17: Input I1+ 18: 24 V_{SEN} 19: n.c. 20: 24 V_{SEN} 21: n.c. 22: 0 V_{SEN} 23: 0 V_{SEN} 24: 0 V_{SEN} 25: FE (earth) Socket: FE (earth)	1: Input I0– 2: Input I0+ 3: Input I1– 4: Input I1+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V_{SEN} 10: 24 V_{SEN} 11: 0 V_{SEN} 12: 0 V_{SEN} 13: Screen[3]	14: Input I2– 15: Input I2+ 16: Input I3– 17: Input I3+ 18: 24 V_{SEN} 19: n.c. 20: 24 V_{SEN} 21: n.c. 22: 0 V_{SEN} 23: 0 V_{SEN} 24: 0 V_{SEN} 25: FE (earth) Socket: FE (earth)

1) Speedcon quick lock, screen additionally on metal thread
2) FE/screen additionally on metal thread
3) Connect screening to functional earth FE

Ordering data				
Designation			Type	Part No.
Plug				
	M12 plug, 5-pin		**SEA-M12-5GS-PG7**	**175 487**
	Sub-D plug, 25-pin		**SD-SUB-D-ST25**	**527 522**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable feeds M9 – 1 cable feed for multi-pin plug		**AK-8KL**	**538 219**
	Fittings kit		**VG-K-M9**	**538 220**
Screening plate				
	Screening plate for M12 connections		**CPX-AB-S-4-M12**	**526 184**
User's manual				
	User's manual	German	**P.BE-CPX-AX-DE**	**526 415**
		English	**P.BE-CPX-AX-EN**	**526 416**
		Spanish	**P.BE-CPX-AX-ES**	**526 417**
		French	**P.BE-CPX-AX-FR**	**526 418**
		Italian	**P.BE-CPX-AX-IT**	**526 419**
		Swedish	**P.BE-CPX-AX-SV**	**526 420**

Terminal CPX

FESTO

Technical data – Analogue module for temperature inputs

Function

The CPX-PT100 analogue input module with 4 channels for temperature measurement allows the connection of up to 4 temperature sensors of type PT100-PT1000, Ni100-Ni1000 etc. Depending on the connection block selected, the temperature module supports various connection concepts with different numbers of sockets or clamps.

Applications

- Temperature module for temperature sensors PT100, PT200, PT500, PT1000, Ni100, Ni120, Ni500, Ni1000
- Supports connection blocks with M12, Harax and terminal connection
- Temperature module features can be parameterised
- 2-wire, 3-wire and 4-wire connection
- The temperature module receives the voltage supply for the electronics and the sensors from the interlinking block
- Temperature module protection and diagnosis through integrated electronic fuse protection

General technical data			
Type			**CPX-4AE-T**
Part No.			**541 486**
			Temperature input
No. of analogue inputs			Choice of 2 or 4
Max. power supply per module		[A]	0.7
Fuse protection			Internal electronic fuse protection for sensor supply
Current consumption from 24 V sensor supply (quiescent current)		[mA]	Typically 50
Supply voltage of sensors		[V]	24 DC ±25%
Sensor type (parameterisable for each channel by means of DIL switch)			PT100, PT200, PT500, PT1000 Ni100, Ni120, Ni500, Ni1000
Temperature range	Pt standard	[°C]	–200 ... +850
	Pt climatic	[°C]	–120 ... +130
	Ni	[°C]	–60 ... +180
Sensor connection technology			2-wire, 3-wire and 4-wire technology
Resolution			15 bit + prefix
Operating error limit relative to input range		[%]	±0.06
Basic error limit (25°C)	Standard	[K]	±0.6
	Pt climatic	[K]	±0.2
Temperature errors relative to input range		[%]	±0.001
Linearity errors (no software scaling)		[%]	±0.02
Repetition accuracy (at 25 °C)		[%]	±0.05
Max. line resistance per conductor		[Ω]	10
Max. permissible input voltage		[V]	±30
Cycle time (module)		[ms]	≤ 250

Terminal CPX

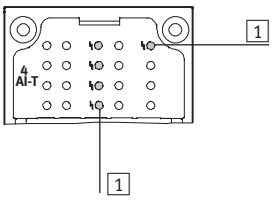
Technical data – Analogue module for temperature inputs

FESTO

General technical data			
Type			CPX-4AE-T
Part No.			541 486
Data format			15 bit + prefix, complement of two, binary notation in tenths of a degree
Line length			Max. 200 m (screened)
Electrical isolation	Channel – Channel		No
	Channel – Internal bus		Yes
LED displays	Group diagnosis		1
	Channel diagnosis		4
Diagnosis			■ Short circuit/overload channel ■ Parameterisation errors ■ Value falling below nominal range/full-scale value ■ Value exceeding nominal range/full-scale value ■ Wire break
Parameterisation			■ Unit of measurement and interference frequency suppression ■ Diagnostic message in the event of a wire break or short circuit ■ Limit monitoring per channel ■ Sensor connection technology ■ Sensor type/temperature coefficient, temperature range ■ Limit value per channel ■ Measured value smoothing
Protection class to EN 60 529			Depending on connection block
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Polymer
Grid dimension		[mm]	50
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50
Weight		[g]	38

Connection and display components

CPX-4AE-T



1 Error LED (red)
2 Channel-oriented error LEDs (red)

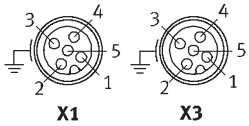
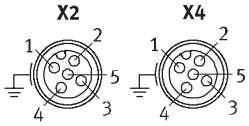
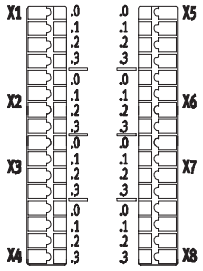
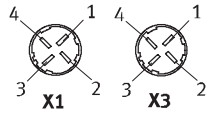
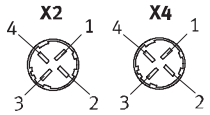
Connection block/analogue module combinations		
Connection blocks	Part No.	Temperature module
		CPX-4AE-T
CPX-AB-8-M8-3POL	**195 706**	–
CPX-AB-8-M8X2-4POL	**541 256**	–
CPX-AB-4-M12X2-5POL	**195 704**	■
CPX-AB-4-M12X2-5POL-R	**541 254**	■
CPX-AB-4-M12-8POL	**526 178**	–
CPX-AB-8-KL-4POL	**195 708**	■
CPX-AB-1-SUB-BU-25POL	**525 676**	–
CPX-AB-4-HAR-4POL	**525 636**	■

Terminal CPX

Technical data – Analogue module for temperature inputs

FESTO

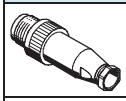
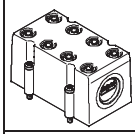
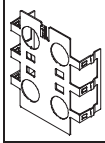
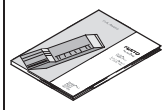
Pin allocation

Inputs, connection block	CPX-4AE-I	
CPX-AB-4-M12X2-5POL and CPX-AB-4-M12X2-5POL-R[1]		
	X1.1: Input I0+ X1.2: Input U0+ X1.3: Input I0– X1.4: Input U0– X1.5: FE (earth)[2]	X3.1: Input I2+ X3.2: Input U2+ X3.3: Input I2– X3.4: Input U2– X3.5: FE (earth)[2]
	X2.1: Input I1+ X2.2: Input U1+ X2.3: Input I1– X2.4: Input U1– X2.5: FE (earth)[2]	X4.1: Input I3+ X4.2: Input U3+ X4.3: Input I3– X4.4: Input U3– X4.5: FE (earth)[2]
CPX-AB-8-KL-4POL		
	X1.0: Input I0+ X1.1: Input I0– X1.2: Input U0– X1.3: FE (earth) X2.0: n.c. X2.1: n.c. X2.2: Input U0+ X2.3: FE (earth) X3.0: Input I1+ X3.1: Input I1– X3.2: Input U1– X3.3: FE (earth) X4.0: n.c. X4.1: n.c. X4.2: Input U1+ X4.3: FE (earth)	X5.0: Input I2+ X5.1: Input I2– X5.2: Input U2– X5.3: FE (earth) X6.0: n.c. X6.1: n.c. X6.2: InputUI2+ X6.3: FE (earth) X7.0: Input I3+ X7.1: Input I3– X7.2: Input U3– X7.3: FE (earth) X8.0: n.c. X8.1: n.c. X8.2: Input U3+ X8.3: FE (earth)
CPX-AB-4-HAR-4POL		
	X1.1: Input I0+ X1.2: Input U0+ X1.3: Input I0– X1.4: Input U0–	X3.1: Input I2+ X3.2: Input U2+ X3.3: Input I2– X3.4: Input U2–
	X2.1: Input I1+ X2.2: Input U1+ X2.3: Input I1– X2.4: Input U1–	X4.1: Input I3+ X4.2: Input U3+ X4.3: Input I3– X4.4: Input U3–

1) Speedcon quick lock, screen additionally on metal thread
2) FE/screen additionally on metal thread

Terminal CPX

Accessories – Analogue module for temperature inputs

Ordering data				
Designation			Type	Part No.
Plug				
	M12 plug, 5-pin		**SEA-M12-5GS-PG7**	**175 487**
	HARAX plug, 4-pin		**SEA-GS-HAR-4POL**	**525 928**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable feeds M9 – 1 cable feed for multi-pin plug		**AK-8KL**	**538 219**
	Fittings kit		**VG-K-M9**	**538 220**
Screening plate				
	Screening plate for M12 connections		**CPX-AB-S-4-M12**	**526 184**
User's manual				
	User's manual	German	**P.BE-CPX-AX-DE**	**526 415**
		English	**P.BE-CPX-AX-EN**	**526 416**
		Spanish	**P.BE-CPX-AX-ES**	**526 417**
		French	**P.BE-CPX-AX-FR**	**526 418**
		Italian	**P.BE-CPX-AX-IT**	**526 419**
		Swedish	**P.BE-CPX-AX-SV**	**526 420**

Terminal CPX

Technical data – Analogue module for outputs

FESTO

Function

Analogue modules control devices with a standard analogue interface such as proportional valves, etc. Depending on the connection block selected, the analogue module supports various connection concepts with different numbers of sockets or clamps.

Applications

- Analogue module for 0 ... 10 V, 0 ... 20 mA or 4 ... 20 mA
- Supports connection blocks with M12, Sub-D and terminal connection
- Analogue module features can be parameterised
- Different data formats available
- Operation with and without electrical isolation possible
- The analogue module receives the voltage supply for the electronics and the actuators from the interlinking block
- Analogue module protection and diagnosis through integrated electronic fuse protection

General technical data				
Type			CPX-2AA-U-I	
Part No.			526 170	
			Voltage output	Current output
No. of analogue outputs			2	
Max. actuator supply per module		[A]	2.8	
Fuse protection			Internal electronic fuse protection for actuator supply	
Current consumption from 24 V sensor supply (at full load)		[mA]	Max. 150	
Current consumption from 24 V actuator supply (at full load)		[A]	4 ... 10	
Supply voltage for actuators		[V DC]	24 ±25%	
Signal range (parameterisable for each channel by means of DIL switch or software)			0 ... 10 V DC	0 ... 20 mA 4 ... 2 mA
Resolution			12 bit	
No. of units			4096	
Absolute accuracy		[%]	±0.6	
Linearity errors (no software scaling)		[%]	±0.1	
Repetition accuracy (at 25 °C)		[%]	0.05	
Encoder selection	Load resistance for ohmic load	[kΩ]	Min. 1	Max. 0.5
	Load resistance for capacitive load	[µF]	Max. 1	–
	Load resistance for inductive load	[mH]	–	Max. 1
	Short circuit protection analogue output		Yes	–
	Short circuit current analogue output	[mA]	Approx. 20	–
	Open circuit voltage	[V DC]	–	18
	Destruction limit against externally applied voltage	[V DC]	15	
	Actuator connection		2 wires	
Cycle time (module)		[ms]	≤ 4	

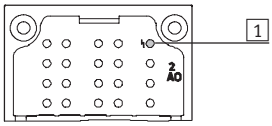
Terminal CPX

Technical data – Analogue module for outputs

General technical data				
Type			CPX-2AA-U-I	
Part No.			526 170	
			Voltage output	Current output
Response time	for ohmic load	[ms]	0.1	
	for capacitive load	[ms]	0.7	–
	for inductive load	[ms]	–	0.5
Data format			15 bit + prefix, linear scaling 12 bit right-justified, type 03 compatible 12 bit left-aligned, S7 compatible 12 bit left-aligned, S5 compatible	
Line length		[m]	Max. 30 (screened)	
LED displays	Group diagnosis		1	
	Channel diagnosis		Yes, by means of flashing frequency of group diagnosis	
Diagnosis			■ Short circuit/overload, actuator supply ■ Parameterisation errors ■ Value falling below nominal range/full-scale value ■ Value exceeding nominal range/full-scale value ■ Wire break	
Parameterisation			■ Short circuit monitoring, actuator supply ■ Short circuit monitoring, analogue output ■ Behaviour after short circuit, actuator supply ■ Data format ■ Lower limit value/full-scale value ■ Upper limit value/full-scale value ■ Monitoring of value falling below nominal range/full-scale value ■ Monitoring of value exceeding nominal range/full-scale value ■ Monitoring of wire break ■ Signal range	
Protection class to EN 60 529			Depending on connection block	
Temperature range	Operation	[°C]	–5 ... +50	
	Storage/transport	[°C]	–20 ... +70	
Materials			Polymer	
Grid dimension		[mm]	50	
Dimensions (incl. interlinking block and connection block) W x L x H		[mm]	50 x 107 x 50	
Weight		[g]	38	

Connection and display components

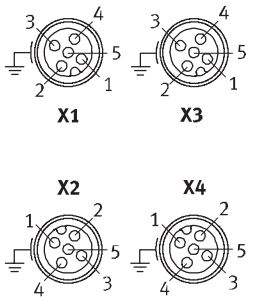
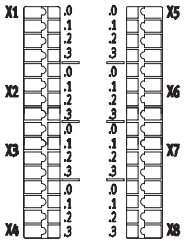
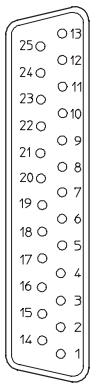
CPX-2AA-U-I



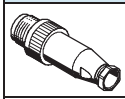
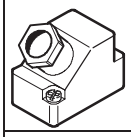
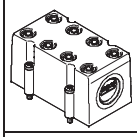
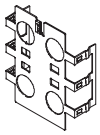
1 Error LED (red; module error)

Connection block/analogue module combinations		
Connection blocks	Part No.	Analogue module
		CPX-2AA-U-I
CPX-AB-8-M8-3POL	**195 706**	–
CPX-AB-8-M8X2-4POL	**541 256**	–
CPX-AB-4-M12X2-5POL	**195 704**	■
CPX-AB-4-M12X2-5POL-R	**541 254**	■
CPX-AB-4-M12-8POL	**526 178**	–
CPX-AB-8-KL-4POL	**195 708**	■
CPX-AB-1-SUB-BU-25POL	**525 676**	■
CPX-AB-4-HAR-4POL	**525 636**	–

Pin allocation

Connection block outputs	CPX-2AA-U-I	
CPX-AB-4-M12X2-5POL and CPX-AB-4-M12X2-5POL-R[1]		
	X1.1: 24 V_{OUT} X1.2: Output U0+ X1.3: 0 V_{OUT} X1.4: Output GND X1.5: FE (earth)[2] X2.1: 24 V_{OUT} X2.2: Output I0+ X2.3: 0 V_{OUT} X2.4: Output GND X2.5: FE (earth)[2]	X3.1: 24 V_{OUT} X3.2: Output U1+ X3.3: 0 V_{OUT} X3.4: Output GND X3.5: FE (earth)[2] X4.1: 24 V_{OUT} X4.2: Output I1+ X4.3: 0 V_{OUT} X4.4: Output GND X4.5: FE (earth)[2]
CPX-AB-8-KL-4POL		
	X1.0: 24 V_{OUT} X1.1: 0 V_{OUT} X1.2: Output GND X1.3: FE (earth) X2.0: n.c. X2.1: n.c. X2.2: Output U0+ X2.3: FE (earth) X3.0: 24 V_{OUT} X3.1: 0 V_{OUT} X3.2: Output GDN X3.3: FE (earth) X4.0: n.c. X4.1: n.c. X4.2: Output I0+ X4.3: FE (earth)	X5.0: 24 V_{OUT} X5.1: 0 V_{OUT} X5.2: Output GND X5.3: FE (earth) X6.0: n.c. X6.1: n.c. X6.2: Output U1+ X6.3: FE (earth) X7.0: 24 V_{OUT} X7.1: 0 V_{OUT} X7.2: Output GND X7.3: FE (earth) X8.0: n.c. X8.1: n.c. X8.2: Output I1+ X8.3: FE (earth)
CPX-AB-1-SUB-BU-25POL		
	1: Output GND 2: Output U0+ 3: Output GND 4: Output I0+ 5: n.c. 6: n.c. 7: n.c. 8: n.c. 9: 24 V_{OUT} 10: 24 V_{OUT} 11: 0 V_{OUT} 12: 0 V_{OUT} 13: Screen[3]	14: Output GND 15: Output U1+ 16: Output GND 17: Output I1+ 18: 24 V_{OUT} 19: n.c. 20: 24 V_{OUT} 21: n.c. 22: 0 V_{OUT} 23: 0 V_{OUT} 24: 0 V_{OUT} 25: FE (earth) Socket: FE (earth)

1) Speedcon quick lock, screen additionally on metal thread
2) FE/screen additionally on metal thread
3) Connect screening to functional earth FE

Ordering data				
Designation			Type	Part No.
Plug				
	M12 plug, 5-pin		**SEA-M12-5GS-PG7**	**175 487**
	Sub-D plug, 25-pin		**SD-SUB-D-ST25**	**527 522**
Cover				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable feeds M9 – 1 cable feed for multi-pin plug		**AK-8KL**	**538 219**
	Fittings kit		**VG-K-M9**	**538 220**
Screening plate				
	Screening plate for M12 connections		**CPX-AB-S-4-M12**	**526 184**
User's manual				
	User's manual	German	**P.BE-CPX-AX-DE**	**526 415**
		English	**P.BE-CPX-AX-EN**	**526 416**
		Spanish	**P.BE-CPX-AX-ES**	**526 417**
		French	**P.BE-CPX-AX-FR**	**526 418**
		Italian	**P.BE-CPX-AX-IT**	**526 419**
		Swedish	**P.BE-CPX-AX-SV**	**526 420**

Terminal CPX

Technical data – Pneumatic interface MPA

FESTO

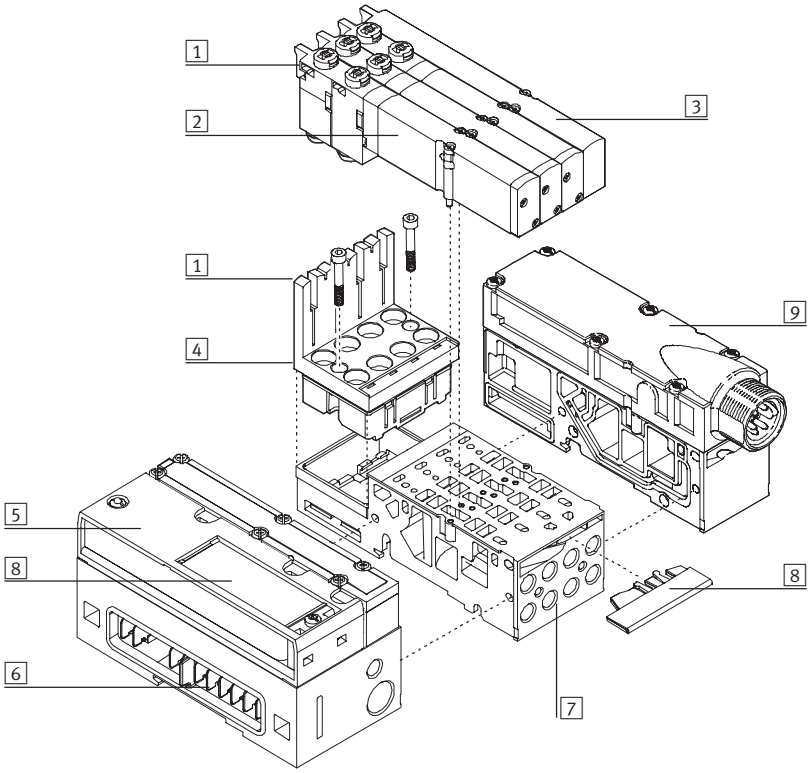
Function

The pneumatic interface MPA establishes the electromechanical connection between the terminal CPX and the valve terminal MPA.
The signals from the bus node are forwarded to the control electronics in the electrical modules of the valve terminal MPA via the integrated CPX bus. The bus signal for activation of the solenoid coils is converted in the electronics module for 4 valves (max. 8 coils).
From a technical point of view, the individual MPA pneumatic modules each represent a separate electrical module with digital outputs. Valves, which are electrically isolated, can be supplied with power via the interlinking block CPX-GE-EV-V.

Applications

- Interface to the valve terminal MPA
- Max. 128 solenoid coils
- Max. 16 electronic modules
- Features of the electronics module of the valve terminal MPA can be parameterised, e.g. status of the solenoid coils in the event of fieldbus communication being interrupted (fail-safe), individual channel diagnosis can be activated, condition monitoring can be activated individually for each valve
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block and feeds them through to the electronics modules of the valve terminal MPA
- Electronics modules of the valve terminal MPA:
  - Undervoltage of valves
  - Short circuit of valves
  - Open Load of valves
  - Counter preset reached in condition monitoring

Overview of pneumatic interface MPA and valve terminal MPA



1 LEDs
  – Outputs (yellow)
  – Error (red)
  – Module error (all LEDs red)
2 Valves
3 Blanking plate
4 Electronics module
5 Pneumatic interface MPA
6 Power supply and bus connection
7 Manifold sub-base
8 Inscription areas
9 Valve power supply (creation of zones with power supply that can be activated separately)

Terminal CPX

Technical data – Pneumatic interface VTSA

FESTO

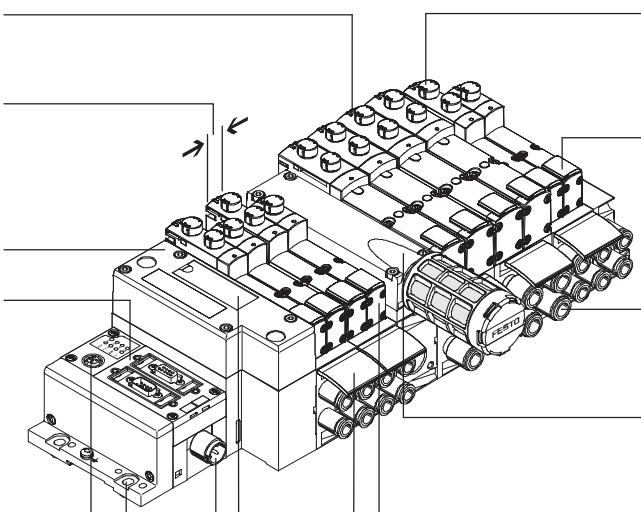
Function

The pneumatic interface VTSA establishes the electromechanical connection between the terminal CPX and the valve terminal type 44 VTSA.
A complete pneumatic control loop system (FB-valve-drive-sensor-FB) can therefore be connected on the fieldbus using the input modules of the CPX terminal.
Different circuits for valves and electrical outputs are implemented using an additional power supply. The integrated valve diagnostic functions enable the causes of errors to be found quickly, therefore increasing system availability.

Applications

- Interface to valve terminal VTSA
- Max. 32 solenoid coils
- Address space allocation (configuration) of valve terminals can be set using integrated DIL switches
- Pneumatic interface features can be parameterised, e.g. status of the solenoid coils in the event of fieldbus communication being interrupted (fail-safe)
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block
- Detection of missing solenoid coils and short circuit monitoring for the valves

Overview of pneumatic interface VTSA and valve terminal VTSA



Reduced downtimes:
LED diagnosis on the spot

Width 18 mm (02) and 26 mm (01) can be combined on a single terminal without adapter

Pneumatic interface to CPX

Straightforward electrical connections
- Fieldbus connection via CPX
- Multi-pin plug connection with pre-assembled cable or terminal strip (Cage Clamp)
- Control block via CPX

CPX diagnostic interface for handheld devices (channel-oriented diagnosis down to the individual valve)

Quick mounting:
Directly using screws or H-rail

Safe:
Valves, outputs and logic voltage can be switched off separately

Reliable operation:
Manual override pushing/detenting or covered

Flexible:
– 32 valve positions/32 solenoid coils

Functional:
Robust metal thread or pre-assembled QS connections

Modular:
Supply plates facilitate the creation of multiple pressure zones as well as numerous additional exhaust and supply ports

Comprehensive valve functions

Practical:
Large inscription labels

Terminal CPX

Technical data – Pneumatic interface MIDI/MAXI

FESTO

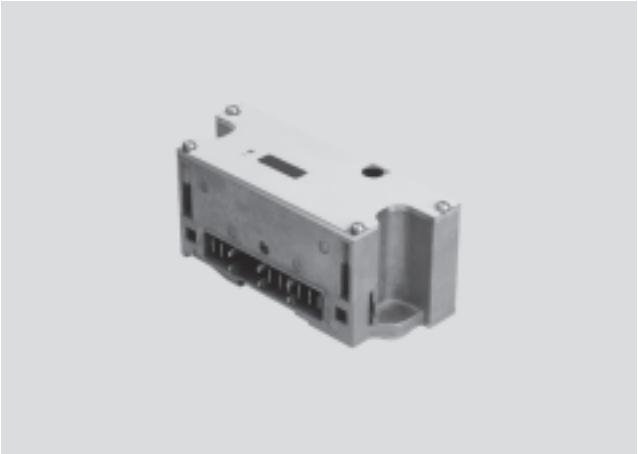
Function

The pneumatic interface MIDI/MAXI connects the valve terminal MIDI/MAXI to the supported fieldbus protocols of the terminal CPX. A complete pneumatic control loop system (FB-valve-drive-sensor-FB) can therefore be connected on the fieldbus using the input modules of the terminal CPX.

Different circuits for valves and electrical outputs are implemented using an additional power supply. The integrated valve diagnostic functions enable the causes of errors to be found quickly, therefore increasing system availability.

Applications

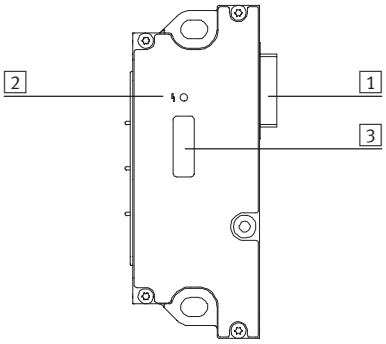
- Interface to valve terminals MIDI/MAXI
- Max. 26 solenoid coils
- Address space allocation (configuration) of valve terminals can be set using integrated DIL switches
- Pneumatic interface features can be parameterised, e.g. status of the solenoid coils in the event of fieldbus communication being interrupted (fail-safe)
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block



General technical data			
Type			**CPX-GP-03-4,0**
Part No.			**195 738**
No. of solenoid coils			26
Max. power supply	per module	[A]	4
	per channel	[A]	0.2
Fuse protection			Internal electronic fuse protection for each valve output
Module current consumption from electronics/sensor supply		[mA]	Typ. 15
Supply voltage for valves		[V]	24 DC +10% –15%
Electrical isolation	Channel – Channel		No
	Channel – Internal bus		Yes, using an additional power supply for valves (in preparation)
LED displays	Group diagnosis		1
	Channel diagnosis		–
	Channel status		– (on valves)
Diagnosis			■ Load voltage of valves
Parameterisation			■ Module monitoring ■ Failsafe behaviour, channel x
Protection class to EN 60 529			IP65
Temperature range	Operation	[°C]	–5 ... +50
	Storage/transport	[°C]	–20 ... +70
Materials			Die-cast aluminium
Grid dimension		[mm]	50
Dimensions W x L x H		[mm]	50 x 132 x 55
Weight		[g]	390

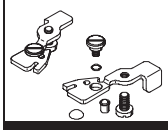
Connection and display components

CPX-GP-03-4,0



1 Connecting plug to valves
2 Error LED (red)
3 DIL switch under transparent cover

Ordering data

Designation		Type	Part No.
H-rail mounting			
	For mounting CPX terminal and valve terminal MIDI on H-rail	**CPX-03-4,0**	**526 033**
	For mounting CPX terminal and valve terminal MAXI on H-rail	**CPX-03-7,0**	**526 034**

Terminal CPX

Technical data – Pneumatic interface CPA

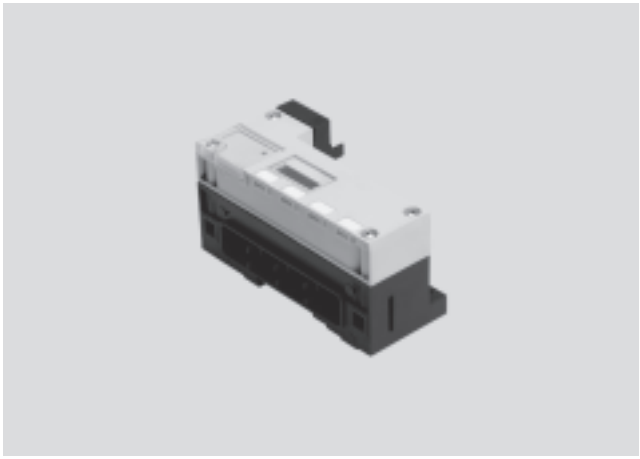
FESTO

Function

The pneumatic interface CPA connects the valve terminal CPA to the supported fieldbus protocols of the CPX terminal. A complete pneumatic control loop system (FB-valve-drive-sensor-FB) can therefore be connected on the fieldbus using the input modules of the CPX terminal.
Different circuits for valves and electrical outputs are implemented using an additional power supply. The integrated valve diagnostic functions enable the causes of errors to be found quickly, therefore increasing system availability.

Applications

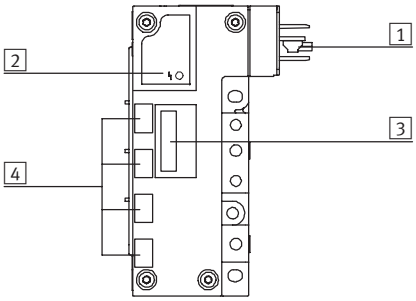
- Interface to CPA10 and CPA14 valve terminals
- Max. 22 solenoid coils
- Address space allocation (configuration) of valve terminals can be set using integrated DIL switches
- Pneumatic interface features can be parameterised, e.g. status of the solenoid coils in the event of fieldbus communication being interrupted (fail-safe)
- The pneumatic interface receives the voltage for the electronics and the supply voltage for the valves from the left-hand interlinking block
- Detection of missing solenoid coils and short circuit monitoring for the valves



General technical data				
Type			CPX-GP-CPA-10	CPX-GP-CPA-14
Part No.			195 710	195 712
No. of solenoid coils			22	22
Max. power supply	per module	[A]	4	
	per channel	[A]	0.2	
Fuse protection			Internal electronic fuse protection for each valve output	
Module current consumption from electronics/sensor supply		[mA]	Typ. 15	
Supply voltage for valves		[V]	24 DC +10% –15%	
Electrical isolation	Channel – Channel		No	
	Channel – Internal bus		Yes, using an additional power supply for valves (in preparation)	
LED displays	Group diagnosis		1	
	Channel diagnosis		–	
	Channel status		– (on valves)	
Diagnosis			■ Load voltage of valves ■ Short circuit solenoid coils (channel-oriented) ■ Wire break solenoid coils (channel-oriented quiescent current detection for valve solenoid coils)	
Parameterisation			■ Module monitoring ■ Wire break monitoring, channel x ■ Failsafe behaviour, channel x	
Protection class to EN 60 529			IP65	
Temperature range	Operation	[°C]	–5 ... +50	
	Storage/transport	[°C]	–20 ... +70	
Materials			Polymer	
Grid dimension		[mm]	50	
Dimensions W x L x H		[mm]	50 x 110 x 58	
Weight		[g]	150	

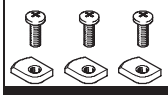
Connection and display components

CPX-GP-CPA-...



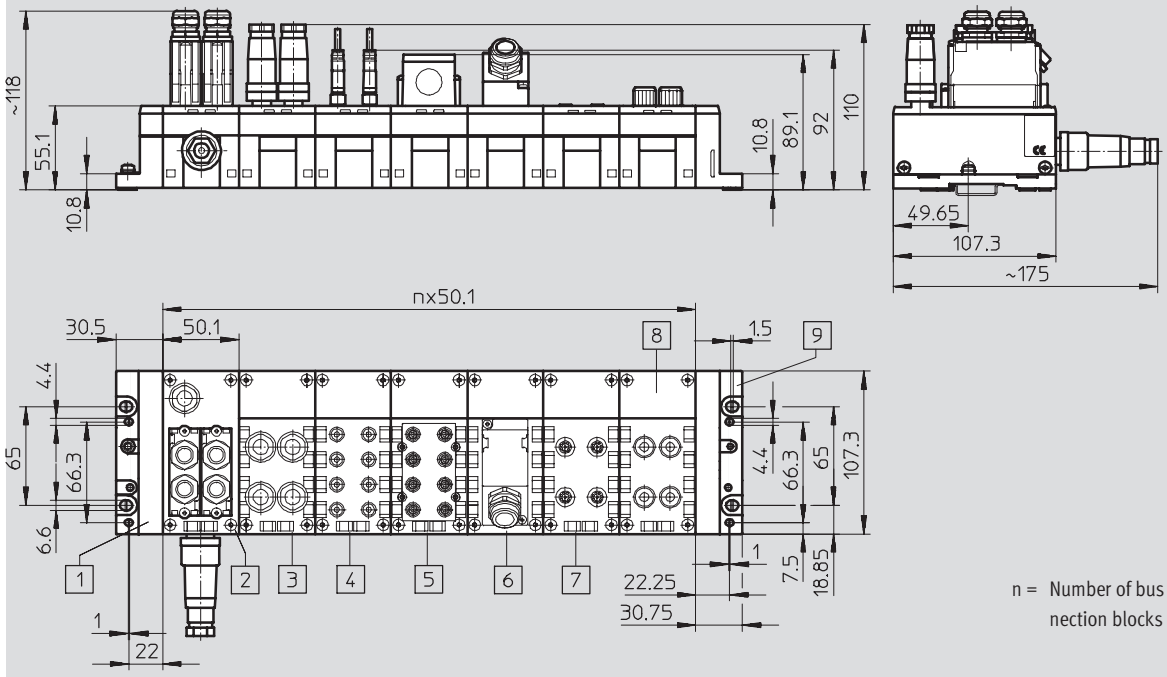
1 Connecting plug to valves
2 Error LED (red)
3 DIL switch under transparent cover
4 Inscription areas for addresses

Ordering data

Designation	Type	Part No.
H-rail mounting		
 For mounting CPX terminal and valve terminal CPA on H-rail	**CPX-CPA-BG-NRH**	**526 032**

Dimensions – CPX terminal Download CAD data ➔ **www.festo.com/en/engineering**

with bus nodes and connection blocks

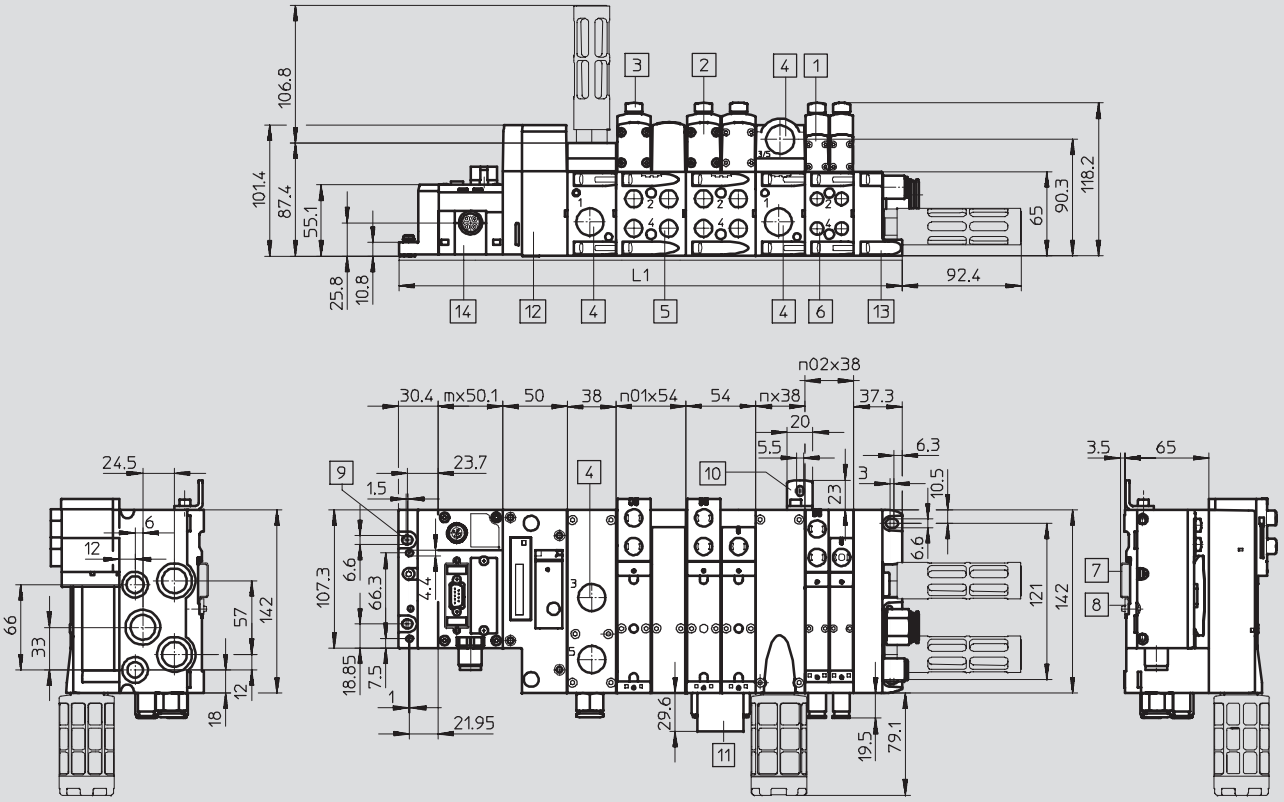


n = Number of bus nodes and connection blocks for CPX

1 Left-hand end plate (earthing plate optional)
2 Bus node
3 Connection block CPX-AB-4-M12-8POL
4 Connection block CPX-AB-8-M8-3POL
5 Connection block CPX-AB-8-KL-4POL
6 Connection block CPX-AB-1-SUB-BU-25POL
7 Connection block CPX-AB-4-HAR-4POL
8 Connection block CPX-AB-4-M12x2-5POL
9 Right-hand end plate

Dimensions – CPX terminal Download CAD data ➔ **www.festo.com/en/engineering**

with bus nodes and valve terminal VTSA



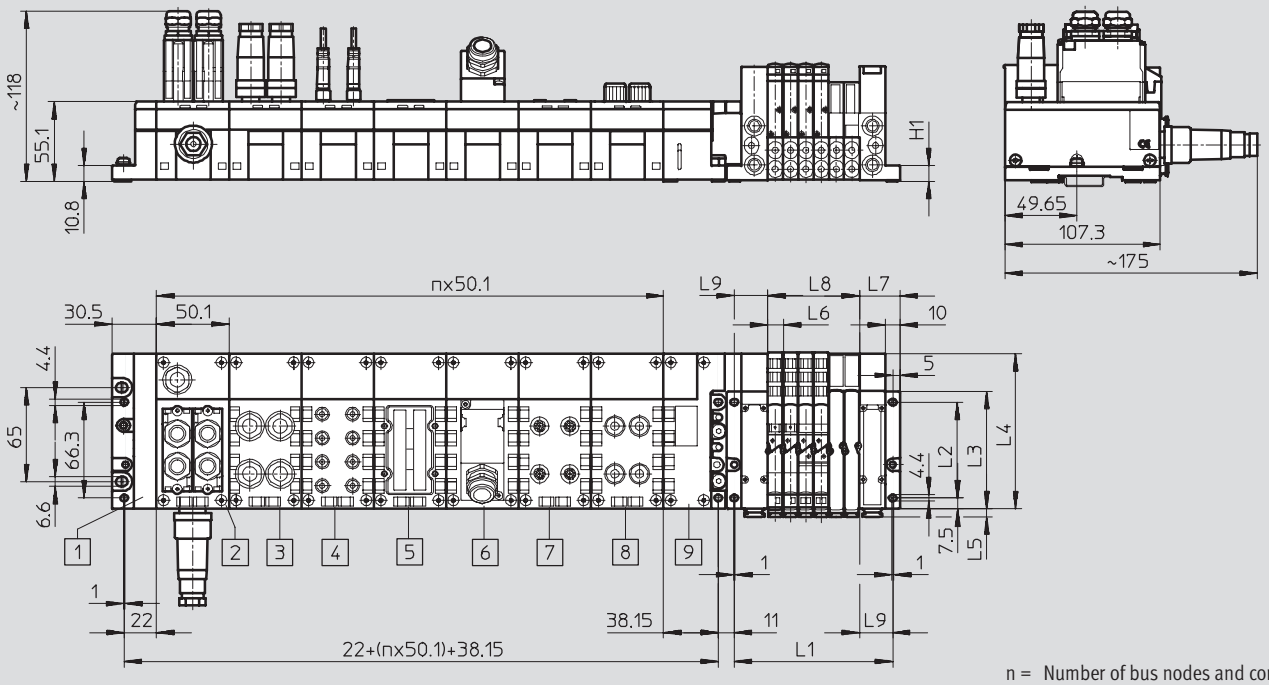
1 Solenoid valve 18 mm (02)
2 Solenoid valve 26 mm (01)
3 Cover cap/manual override
4 Threaded connection G1/2
5 Threaded connection G1/4
6 Threaded connection G1/8
7 H-rail
8 H-rail mounting
9 Mounting hole
10 Additional mounting bracket
11 Inscription label
12 Pneumatic interface CPX
13 End plate
14 CPX module/fieldbus node

n02 Number of 18 mm manifold sub-bases (02)
n01 Number of 26 mm manifold sub-bases (01)
n Number of supply plates (only with selector end plate)
m Number of CPX modules

Width	L1
18 mm (02)	30.4 + m x 50.1 + 50 + n02 x 38 + n x 38 + 37.3
26 mm (01)	30.4 + m x 50.1 + 50 + n01 x 54 + n x 38 + 37.3
Mixture of 18 mm (02) and 26 mm (01)	30.4 m x 50.1 + 50 + n02 x 38 + n01 x 54 + n x 38 + 37.3

Dimensions – CPX terminal Download CAD data ➔ **www.festo.com/en/engineering**

with bus nodes, connection blocks and valve terminal CPA



n = Number of bus nodes and connection blocks for CPX

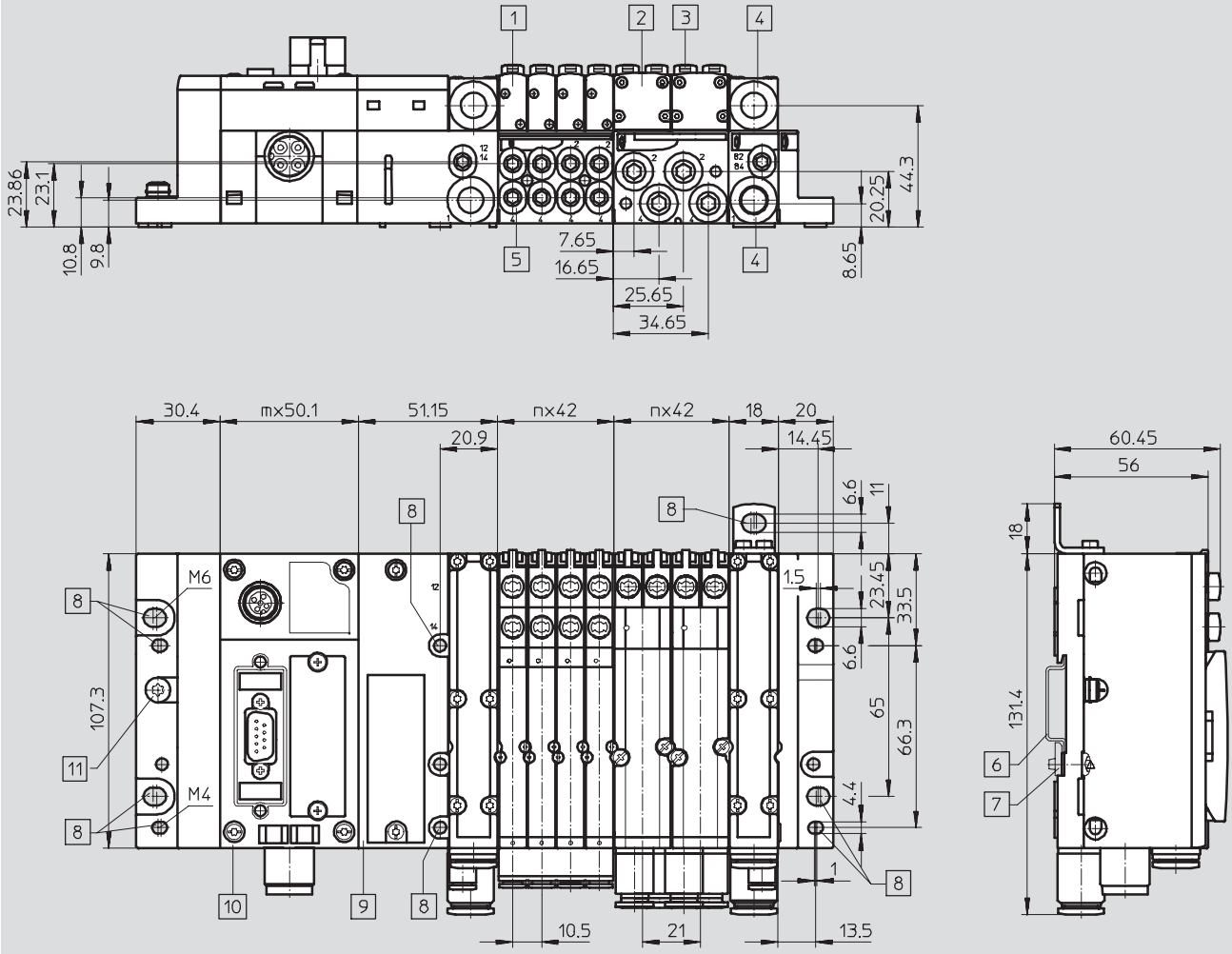
1 Left-hand end plate
2 Bus node
3 Connection block CPX-AB-4-M12-8POL
4 Connection block CPX-AB-8-M8-3POL
5 Connection block CPX-AB-8-KL-4POL
6 Connection block CPX-AB-1-SUB-BU-25POL
7 Connection block CPX-AB-4-HAR-4POL
8 Connection block CPX-AB-4-M12x2-5POL
9 Pneumatic interface CPA

Type	L1[1]	L2 ±0.1	L3	L4	L5	L6	L7	L8[1]	L9 ±0.1	H1
CPA10	46 + (m x 10.6)	66.3	81.3	108.3	5.5	10.6	28	m x 10.6	23	10.8
CPA14	51 + (m x 14.6)	76.1	91.1	118.1	6.5	14.6	31	m x 14.6	26	13

1) m = Number of valves

Dimensions – CPX terminal Download CAD data ➔ **www.festo.com/en/engineering**

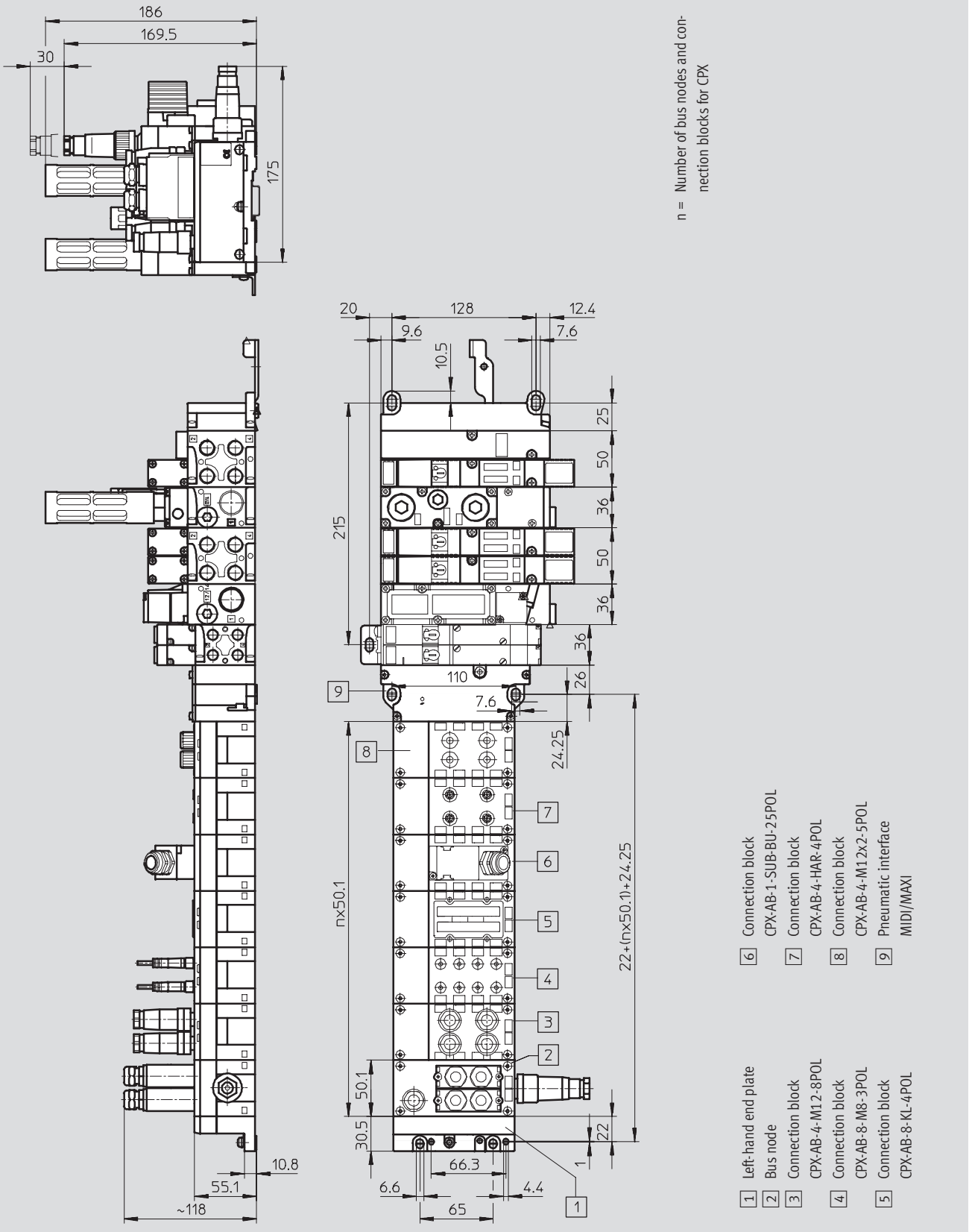
with bus nodes and valve terminal MPA



1 Solenoid valve MPA1
1 Solenoid valve MPA2
3 Manual override
4 Supply/exhaust ports
5 Working ports
6 H-rail
7 H-rail mounting
8 Mounting holes
9 Pneumatic interface MPA
10 CPX module
11 Earthing screw
n Number of sub-bases in a grid of 4 MPA1 or 2 MPA2 valves
m Number of CPX modules

Dimensions – CPX terminal Download CAD data ➔ **www.festo.com/en/engineering**

with bus nodes, connection blocks and valve terminal MIDI/MAXI



Ordering information

Selection of CPX terminal and valve terminal pneumatic components using module numbers

The module number defines the CPX terminal-valve terminal pneumatic components combination.

The pneumatic part and the electrical part are configured with separate order codes. The order code for the electrical part CPX begins with 50E, while the order code for the pneumatic part depends on the selected valve terminal pneumatic components, e.g. 32P-... for MPA

Note

The following pages contain only the module number with the ordering data for the CPX terminal without pneumatic components.

The ordering data for the valve terminal pneumatic components can be found in the respective valve terminal documentation.

Module No.	Combination	Order code
197 330	Electrical valve terminal CPX without pneumatic components	50E-...
539 217	Pneumatic valve terminal VTSA with threaded connection	44P-...
539 218	Pneumatic valve terminal VTSA with NPT thread	44PN-...
530 411	Pneumatic valve terminal MPA	32P-...
173 520	Pneumatic valve terminal CPA10	12P-10-CX-...
174 001	Pneumatic valve terminal CPA14	12P-14-CX-...
18 980	Pneumatic valve terminal MIDI/MAXI	03P-...

General basic data and guidelines

The order code 50E allows a large number of different combinations and thus supports the modular construction of the CPX terminal. The following system limits must be observed:

- One bus node
- Max. 9 I/O modules
- Max. one pneumatic interface
- Max. one interlinking block with system supply

Up to 10 module positions for electrical modules can be configured in the order code. For each module position, the electrical module (electronics module) is defined first, followed by the connection technology and then the supply (optional).

Please note the general guidelines, in particular:

- General basic data and guidelines for possible module positions (➔ 4 / 4.8-14)
- Supported electronics module-connection technology combinations (➔ 4 / 4.8-14)
- Restrictions with regard to the number of modules depending on the selected bus node in borderline cases (➔ 4 / 4.8-23)
- General limit values and guidelines with regard to supplies (➔ 4 / 4.8-19)

Order code

The order code maps the physical construction of the CPX terminal to a linear order code.

Each optional module has its own unique code letters, e.g. CPX-8DE = E, CPX-AB-4-M12x2-5POL = X

The module sequence defines their physical configuration within the CPX terminal.

This applies both to the bus node and to the I/O modules.

Order example

CPX terminal consisting of a bus node with system supply, 8 I/O modules and a pneumatic interface MIDI/MAXI

1. Step 1 – Defining the electrical modules

Bus node

- One bus node CPX-FB13 with Sub-D plug for Profibus DP and system supply (module position 0)

I/O modules

- Two digital input modules (8 inputs each), each with one 4xM12 connection block, 5-pin (module position 1 and 2)
- One digital output module (4 outputs) with one 4xM12 connection block, 5-pin (module position 3)
- One digital input/output module (8 inputs and 8 outputs) with one Sub-D connection block, 25-pin socket (module position 4)
- Three analogue modules (2 inputs each), each with one 4xM12 connection block, 5-pin (module position 5, 6 and 7)
- One analogue module (2 outputs) with one 4xM12 connection block, 5-pin (module position 8)

Module position	0	1	2	3	4	5	6	7	8	9
Electrical module	F13	E	E	A	Y	U	U	U	P	
Connection technology	GE	X	X	X	B	X	X	X	X	
Supply	S									

Resulting order code:
50E-F13GESEXEXAXYBUXUXUXPX

2. Step 2 – Defining the pneumatic interface/right-hand end plate

An additional code letter is assigned to each pneumatic interface or to the right-hand end plate for using the CPX terminal without pneumatic components.
This is appended to the order code and is separated from the rest of the code by a dash.
Example:
Pneumatic interface MIDI/MAXI = code letter A

The price for the pneumatic interface or for the right-hand end plate includes complete assembly as well as the testing of all individual and general functions, comprehensive instructions and any accessories that are required such as the left-hand end plate, for example.

Resulting order code:
50E-F13GESEXEXAXYBUXUXUXPX-A

3. Step 3 – Defining the required user documentation

The CPX user documentation from the example consists of the following:
- CPX system description
- Electronics description – Bus node CPX-FB13
- Description – I/O modules

Code letters are also used to select the user documentation language.
Example:
CPX manual in English = code letter E

If the corresponding code letter for the user's manual is missing, no accompanying documentation is supplied.

All manuals and descriptions are available in PDF format in the Download Area at:
➔ www.festo.com

Resulting order code:
50E-F13GESEXEXAXYBUXUXUXPX-A-E

[M] **Mandatory data** →

Module No.	Valve terminal, electrical part	Electrical module for position 0 ... 9			
197 330	50E	**3 Electrical actuator/inputs and outputs for position 0 ... 9:** F06, F11, F13, F14, F23, T03, T04, T05, T11, T12, T13, T14, T15, T16, T17, T18, E, D, F, L, A, Y, I, T, U, P			
			4 Connection technology for position 0 ... 9: GA, GB, GC, GD, GE, GF, GH, GI, GL, GM, GP, X, GW, W, R, GQ, GO, J, H, B, C		
				[0] **Options**	
				5 Supply for position 0 ... 9: S, Z, V, QS, QZ, QV, QP, QX	
Order example		Module positions			
		0	1	2	3
197 330	**50E**	**F06 GI S**	**E R**	**A X Z**	
1	**2**	**3 + 4 + 5**			

Ordering table

				Conditions	Code		Enter code
[M]	**1**	Module No.	**197 330**				
	2	Valve terminal, electrical part	CPX – Modular electrical terminal		**50E**		50E
		Electrical module for position 0 ... 9			**-**		-
	3	Electrical actuator/inputs and outputs Position 0 ... 9	Fieldbus node for Interbus	[1]	**F06**		
			Fieldbus node for DeviceNet	[1] [2]	**F11**		
			Fieldbus node for Profibus DP	[1]	**F13**		
			Fieldbus node for CANopen	[1]	**F14**		
			Fieldbus node for CC-Link	[1]	**F23**		
			Front End Controller Remote	[1]	**T03**		
			Front End Controller Monitoring	[1]	**T04**		
			Front End Controller Remote I/O	[1]	**T05**		
			CP interface, 16 DI and 16 DO	[1]	**T11**		
			CP interface, 32 DI and 32 DO	[1]	**T12**		
			CP interface, 48 DI and 48 DO	[1]	**T13**		
			CP interface, 64 DI and 64 DO	[1]	**T14**		
			CP interface, 80 DI and 80 DO	[1]	**T15**		
			CP interface, 96 DI and 96 DO	[1]	**T16**		
			CP interface, 112 DI and 112 DO	[1]	**T17**		
			CP interface, 128 DI and 128 DO	[1]	**T18**		
			Input module, 4 digital inputs		**F**		
			Input module, 8 digital inputs		**E**		
			Input module, 8 digital inputs (channel diagnosis)		**D**		
			Output module, 8 digital outputs		**L**		
			Output module, 4 digital outputs		**A**		
			Input/output module, 16-fold, 8 digital I/O each		**Y**		
			Input module, 4 analogue inputs (current)		**I**		
			Input module, 4 analogue inputs (temperature)		**T**		
			Input module, 2 analogue inputs		**U**		
↓			Output module, 2 analogue outputs		**P**		

[1] **F..., T...**
Observe maximum number of inputs/outputs; → Tables 4 / 4.8-23.

[2] **F11** Only permissible in first module position.

Transfer order code

			0	1	2	3
197 330	**50E**	–				
1	**2**		**3 + 4 + 5**			

M Mandatory data

Electrical module for position 0 ... 9

3 Electrical actuator/inputs and outputs for position 0 ... 9: F06, F11, F13, F14, F23, T03, T04, T05, T11, T12, T13, T14, T15, T16, T17, T18, E, D, F, L, A, Y, I, T, U, P

4 Connection technology for position 0 ... 9: GA, GB, GC, GD, GE, GF, GH, GI, GL, GM, GP, X, GW, W, R, GQ, GO, J, H, B, C

O Options

5 Supply for position 0 ... 9: S, Z, V, QS, QZ, QV, QP, QX

Module positions

4	5	6	7	8	9

3 + 4 + 5

Ordering table

				Conditions	Code		Enter code
M	4	Connection technology for position 0 ... 9	Adapter, 2xM12 5-pin, DeviceNet/CANopen		GA		
			Connection set, 5-pin screw terminal, for DeviceNet/CANopen		GB		
			Without node-specific connection technology		GC		
			Straight plug, IP65 Sub-D, 9-pin, for DeviceNet/CANopen		GD		
			Straight plug, IP65 Sub-D, 9-pin, for Profibus DP		GE		
			Adapter, 2xM12 B-coded, for Profibus DP		GF		
			Connection set, IP65 RJ45, for Ethernet		GH		
			Connection set, IP65 2xSub-D, 9-pin, for Interbus	3	GI		
			Adapter, 5-pin screw terminal, for CC-Link		GL		
			Straight plug, IP65 Sub-D, 9-pin, for CC-Link		GM		
			Connection block 2xM12 for Interbus	3	GP		
			Connection block, 4xM12, 5-pin, double		X		
			Connection block, 4xM12, 5-pin, double, metal thread		GW		
			Connection block, 4xM12, 5-pin, double, screened		W		
			Connection block, 8xM8, 3-pin		R		
			Connection block, 8xM8, 4-pin, double		GQ		
			Connection block, 2xM12, B-coded, 5-pin for Profibus DP	4	GO		
			Connection block, 8x CageClamp clamps, 4-pin		J		
			Connection block, 4x Harax, 4-pin		H		
			Connection block, Sub-D, 25-pin, socket		B		
			Connection block, 4xM12, 8-pin (DNCV)		C		
O	5	Feed for position 0 ... 9	Interlinking block with system supply		S		
			Interlinking block with additional power supply		Z		
			Interlinking block with valve supply	5	V		
			Interlinking block with system supply, M18, 4-pin		QS		
			Interlinking block with additional power supply, M18, 4-pin		QZ		
			Interlinking block with valve supply, M18, 4-pin	5	QV		
			Interlinking block with system supply, 7/8", 5-pin	5	QP		
↓			Interlinking block with additional power supply, 7/8", 5-pin		QX		

3 **GI, GP** Only with electrical actuation/inputs and outputs F06 (fieldbus node for Profibus Interbus).

4 **GO** Only with electrical actuation/inputs and outputs F13 (fieldbus node for Profibus DP).

5 **V, QV, QP** All manifold sub-bases with "electrical module, electrically isolated" H must be selected in the pneumatics of the MPA. Only possible after electrical actuation/inputs and outputs T11 ... T18 (CP interface).

Transfer order code

4	5	6	7	8	9

3 + 4 + 5

M Mandatory data

Pneumatic interface
Z, B, C, A, D, S

– **Z**

6

Ordering table

				Conditions	Code		Enter code
M	6	Pneumatic interface	CPX end plate, right-hand	6	-Z		
			CPX pneumatic interface to CPA10	7	-B		
			CPX pneumatic interface to CPA14	8	-C		
			CPX pneumatic interface to Midi/Maxi	9	-A		
			CPX pneumatic interface to MPA	10	-D		
			CPX pneumatic interface to terminal type 44 (ISO)		-S		

6 **Z** Only for CPX without pneumatics (module system no. 197 330), but essential in this case.

7 **B** Only for CPX with CPA-10 (module system no. 173 520), but essential in this case.

8 **C** Only for CPX with CPA-14 (module system no. 174 001), but essential in this case.

9 **A** Only for CPX with Midi/Maxi (module system no. 18 980), but essential in this case.

10 **D** Only for CPX with MPA (module system no. 533 203), but essential in this case.

Transfer order code

–

6

➔ [0] **Options**

User's manual	Electrical accessories	Power supply socket	Plug, 4-pin	Plug, 5-pin	Plug for 2 cables	Plug, 3-pin	Plug for connection block	Socket, straight	H-rail mounting kit	Additional attachment
D, E, F, I, J, S, V		...N, ...M, ...I, ...J	...S, ...T, ...W	...P	...X, ...K	...C, ...R	...A, ...E	...GS	H	U

– 7 + 8

Ordering table

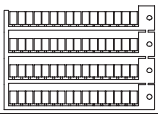
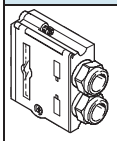
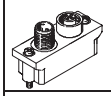
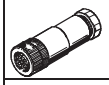
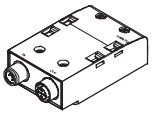
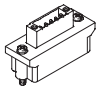
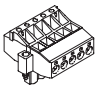
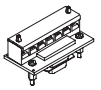
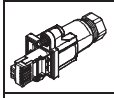
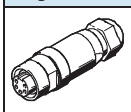
Module No.			197 330	Conditions	Code		Enter code
[0]	7	User's manual	German		-D		
			English		-E		
			French		-F		
			Italian		-I		
			Japanese	[11]	-J		
			Spanish		-S		
			Swedish		-V		
	8	Electrical accessories			+		+
		Straight socket, M18, 4-pin, for operating voltage	Pg9 (1.5 mm²)	1 ... 99 (NTSD-GD-9)		...N		
			Pg13.5 (2.5 mm²)	1 ... 99 (NTSD-GD-13,5)		...M		
		Angled socket, M18, 4-pin, for operating voltage	Pg9 (1.5 mm²)	1 ... 99 (NTSD-WD-9)		...I		
			Pg11 (2.5 mm²)	1 ... 99 (NTSD-WD-11)		...J		
		Straight plug, M12, for sensors/actuators	4-pin, Pg7	1 ... 99 (SEA-GS-7)		...S		
			4-pin, Pg9	1 ... 99 (SEA-GS-9)		...T		
			4-pin, Pg7 (2.5 mm² cable ∅)	1 ... 99 (SEA-4GS-7-2,5)		...W		
			5-pin, Pg7	1 ... 99 (SEA-M12-5GS-PG7)		...P		
		Straight plug, M12, for 2 cables (DUO)	4-pin, Pg11	1 ... 99 (SEA-GS-11-DUO)		...X		
			5-pin, Pg11	1 ... 99 (SEA-5GS-11-DUO)		...K		
		Straight plug, M8, 3-pin, for sensors/actuators	screw-in	1 ... 99 (SEA-3GS-M8-S)		...C		
			solderable	1 ... 99 (SEA-GS-M8)		...R		
		Straight plug, for sensors/actuators	Harax 4-pin	1 ... 99 (SEA-GS-HAR-4POL)		...A		
			IP65, Sub-D, 25-pin	1 ... 99 (SD-SUB-D-ST25)		...E		
		Socket, straight for operating voltage	7/8", 5-pin	1 ... 99		...GS		
		H-rail mounting kit		1 (CPA-BG-NRH)		H		
		Additional attachments for wall mounting		1	[12]	U		

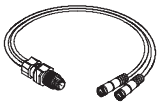
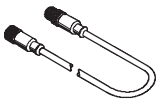
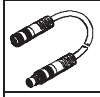
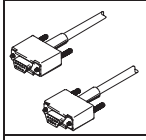
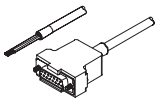
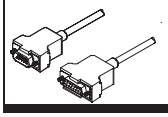
[11] **J** Only with electrical actuation/inputs and outputs F23 (fieldbus node for CC-Link).

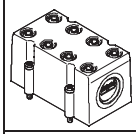
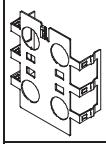
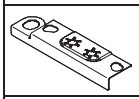
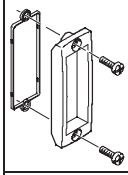
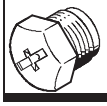
[12] **U** An additional attachment is recommended for more than 4 module positions.

Transfer order code

– 7 + 8

Ordering data – Accessories				
Designation			Type	Part No.
Inscription labels				
	Inscription labels, 6x10, 64 pieces, in frames		**IBS-6x10**	**18 576**
Attachment				
	Attachment for wall mounting (for long valve terminals, 10 pieces)		**CPX-BG-RW-10x**	**529 040**
Plug connector and accessories				
	Plug, Sub-D for INTERBUS	Incoming	**FBS-SUB-9-BU-IB-B**	**532 218**
		Outgoing	**FBS-SUB-9-GS-IB-B**	**532 217**
	Plug, Sub-D for DeviceNet/CANopen		**FBS-SUB-9-BU-2x5POL-B**	**532 219**
	Plug, Sub-D for Profibus DP		**FBS-SUB-9-GS-DP-B**	**532 216**
	Plug, Sub-D for CC-Link		**FBS-SUB-9-GS-2x4POL-B**	**532 220**
	Plug, Sub-D		**FBS-SUB-9-GS-1x9POL-B**	**534 497**
	Bus connection M12 adapter plug (B-coded) for Profibus DP		**FBA-2-M12-5POL-RK**	**533 118**
	Bus connection Micro Style 2xM12 for DeviceNet/CANopen		**FBA-2-M12-5POL**	**525 632**
	Socket for Micro Style connection, M12		**FBSD-GD-9-5POL**	**18 324**
	Plug for Micro Style connection, M12		**FBS-M12-5GS-PG9**	**175 380**
	Connection block M12 adapter (B-coded) for Profibus DP		**CPX-AB-2-M12-RK-DP**	**541 519**
	Connection block M12 adapter plug (B-coded) for INTERBUS		**CPX-AB-2-M12-RK-IB**	**534 505**
	Bus connection Open Style for 5-pin terminal strip for DeviceNet/CANopen		**FBA-1-SL-5POL**	**525 634**
	Bus connection 5-pin terminal strip for DeviceNet/CANopen		**FBSD-KL-2x5POL**	**525 635**
	Bus connection screw terminal for CC-Link		**FBA-1-KL-5POL**	**197 962**
	RJ45/plug		**FBS-RJ45-8-GS**	**534 494**
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
Plug connector and accessories – Power supply				
	Power supply socket	7/8" connection	**NECU-G78G5-C2**	**543 107**

Ordering data – Accessories				
Designation			Type	Part No.
Connecting cables				
	DUO cable M12-2xM8, 4-pin/2x3-pin	2x straight socket	**KM12-DUO-M8-GDGD**	**18 685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18 688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18 687**
	Connecting cable M8-M8, straight plug-straight socket	0.5 m	**KM8-M8-GSGD-0,5**	**175 488**
		1.0 m	**KM8-M8-GSGD-1**	**175 489**
		2.5 m	**KM8-M8-GSGD-2,5**	**165 610**
		5.0 m	**KM8-M8-GSGD-5**	**165 611**
	Connecting cable M8-M12	1.0 m	**KM8-M12-GSGD-1**	**187 859**
		2.5 m	**KM8-M12-GSGD-2,5**	**187 860**
		5.0 m	**KM8-M12-GSGD-5**	**187 861**
	Extension cable M12-M12, 5-pin, straight plug-straight socket	1.5 m	**KV-M12-M12-1,5**	**529 044**
		3.5 m	**KV-M12-M12-3,5**	**530 901**
	Connecting cable M12-M12, 4-pin, straight plug-straight socket	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
	Connecting cable M12-M12, 8-pin, straight plug-straight socket	2.0 m	**KM12-8GD8GS-2-PU**	**525 617**
	Connecting cable M12-M12, 4-pin, straight plug-angled socket	1.0 m	**KM12-M12-GSWD-1-4**	**185 499**
	Connecting cable with angled plug and angled socket	0.25 m	**KVI-CP-3-WS-WD-0,25**	**540 327**
		0.5 m	**KVI-CP-3-WS-WD-0,5**	**540 328**
		2 m	**KVI-CP-3-WS-WD-2**	**540 329**
		5 m	**KVI-CP-3-WS-WD-5**	**540 330**
		8 m	**KVI-CP-3-WS-WD-8**	**540 331**
	Connecting cable with straight plug and straight socket	2 m	**KVI-CP-3-GS-GD-2**	**540 332**
		5 m	**KVI-CP-3-GS-GD-5**	**540 333**
		8 m	**KVI-CP-3-GS-GD-8**	**540 334**
	Programming cable		**KDI-PPA-3-BU9**	**151 915**
	Connecting cable FED		**FEC-KBG7**	**539 642**
	Connecting cable FED		**FEC-KBG8**	**539 643**

Ordering data – Accessories				
Designation			Type	Part No.
Covers and attachments				
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable feeds M9 – 1 cable feed for multi-pin plug		**AK-8KL**	**538 219**
	Fittings kit		**VG-K-M9**	**538 220**
	Screening plate for M12 connections		**CPX-AB-S-4-M12**	**526 184**
	Earthing element for right-hand/left-hand end plates (5 pieces)		**CPX-EPFE-EV**	**538 892**
	Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
	Cover for RJ45 connection		**AK-Rj45**	**534 496**
	Cover cap for sealing unused sockets (10 pieces)	for M8 connections	**ISK-M8**	**177 672**
		M9	**FLANSCHDOSE SER.712**	**356 684**
		for M12 connections	**ISK-M12**	**165 592**