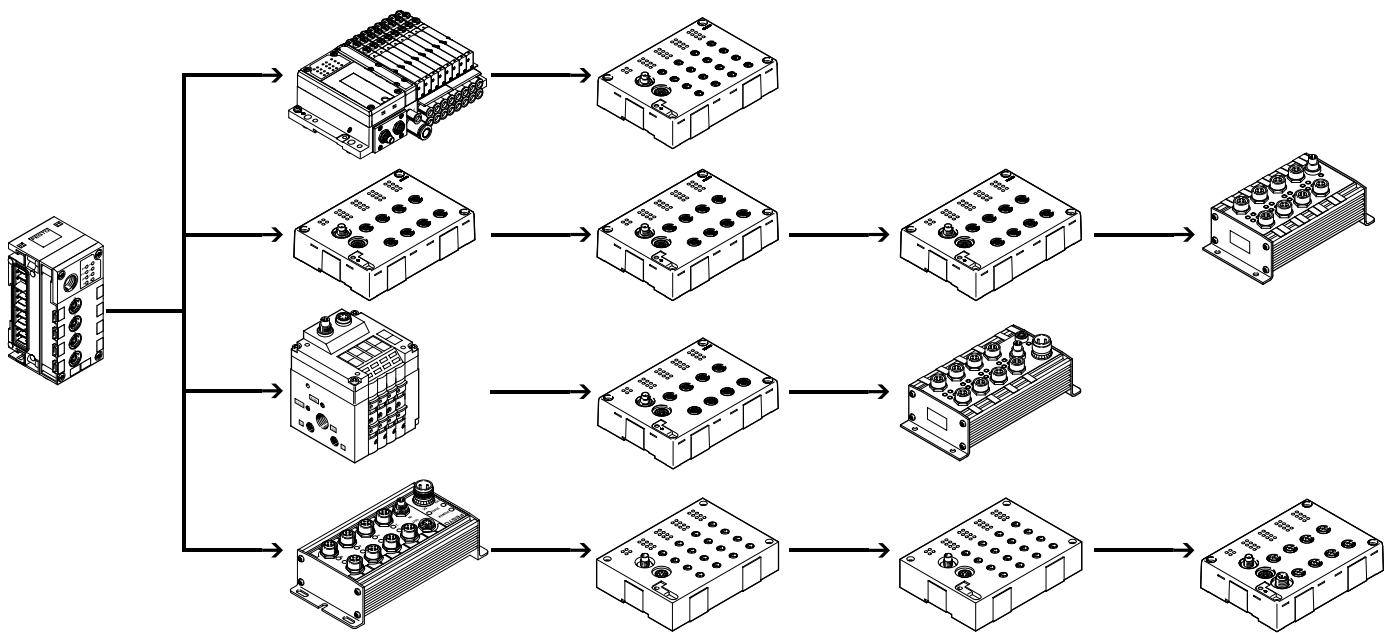


Installation system CPI

FESTO



Key features



Key features

Innovative

- Overall concept for decentralised machine and system structure; combination of centralised and decentralised installation possible in conjunction with the CPX terminal
- Decentralised pneumatic components and sensors for fast processes
- Central electrical components for fieldbus and common power supply
- Flexible configuration of the individual CP strings
- Choice of valve terminal sizes for optimum pneumatic control loop systems
- Performance data as for the CP system with the addition of the comprehensive diagnostic capabilities of the CPX terminal

Sturdy

- Electrical accessories to IP65
- Proven valve terminals CPV (compact), MPA-S (sturdy, modular)
- Electrical input and output modules in metal housing or compact in encapsulated polymer housing
- Sturdy connection technology M12, alternatively M8

Versatile

- A number of CP interfaces can be combined under one bus node
- Four CP strings up to 10 m in length (radius) facilitate optimum decentralisation
- Max. 32 inputs and 32 outputs/valves per string
- Available valves:
 - Valve terminal CPV-SC, max. 170 l/min flow rate
 - Valve terminal MPA-S, max. 700 l/min flow rate
 - Valve terminal CPV, max. 1600 l/min flow rate
 - Valve terminals with I-Port interface (VTUG, CPV, MPA-L, VTUB-12, VTOC)
- Input modules with 8 ... 32 inputs and output modules with 4 ... 8 outputs, each with or without additional power supply

Reliable

- Sturdy modules and accessories
- Ready-to-install system including CP cable (hybrid cable for data and power)
- Short circuit-proof connections with reverse polarity protection
- Valves with separate load voltage supply
- All modules equipped with local diagnostics and status LED
- Diagnostics of each CP string via controller/fieldbus
- Self-learning system (save button) for current configuration
- Modules can be easily replaced at any time

Key features

Installation system CPI

The CPI system is capable of meeting two completely different requirements and resolves the conflict between extensive decentralised modularisation and electrical installation.

High-speed machines require short cycle times and short pneumatic tubing. The valves must be mounted close to the cylinders. The CPI system was developed to fulfil these requirements without having to wire each valve individually.

The system integrates the modular valve terminal MPA-S with internal communication system, valve terminals with integrated sub-base CPV that are suitable for operating small pneumatic drives, and various input/output modules in a single installation concept.

All CP valve terminals and CP modules are connected using a ready-to-install CP cable, and are attached to the CP interface. 4 modules, for example one CPV valve terminal and one to three CP input modules, make up an installation string that ends at the CP interface.

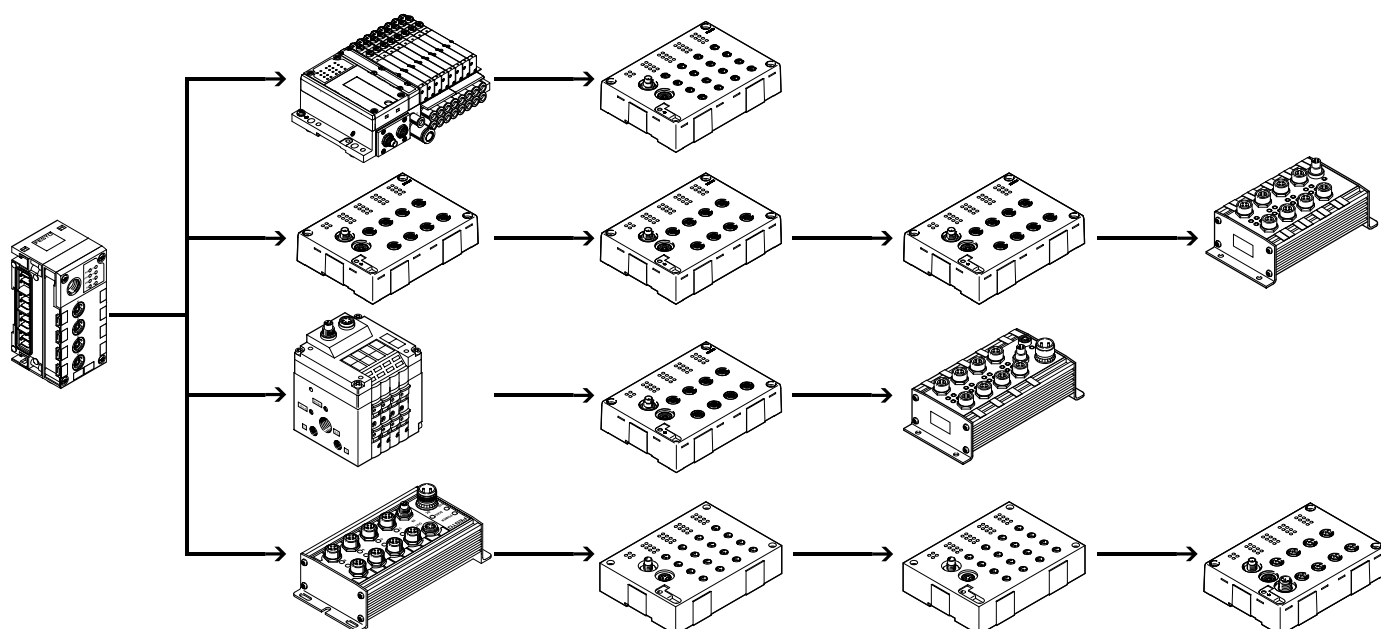
Scope of features:

- Max. 4 installation strings per CP interface
- Max. 10 metre cable length per string (radius)
- Max. 4 CP modules per string
- Max. 32 inputs and max. 32 outputs per string

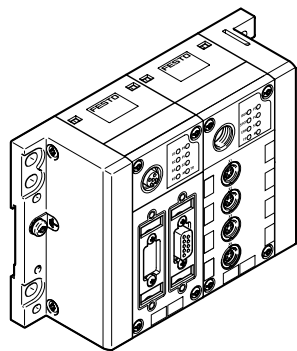
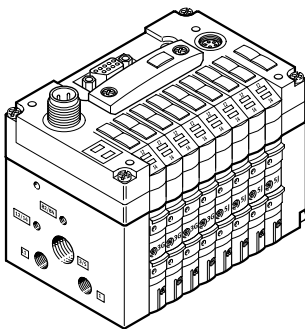
The number of CP modules that can be connected and the number of inputs/outputs is dependent on the type of CP module and the CP interface.

The maximum configuration (4 modules per string, 32 inputs/outputs) is only possible in combination with the CPX terminal and CP modules with CPI functionality.

The CP interface is the central connection point for the power supply to the valves and the sensor supply. The power supply for the sensors connected to the input modules is separate from the load voltage supply for the valves.



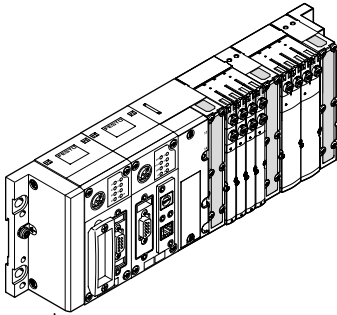
Key features

Node types	
Fieldbus	Valve terminal
	
CPX with CP interface CPX-...	with CP string extension CPV, CPV-SC, MPA-S

Peripherals overview

Integration of the installation system CPI in various connection concepts

Central pneumatic connection (valve terminal)



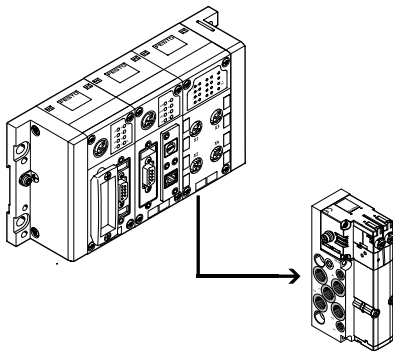
Benefits

- Pneumatic multiple connector plate
- Less tubing required than with individual valves
- Common air supply to the valves
- Central positioning
- Material, weight and cost savings

Disadvantages

- Only effective with a large number of closely spaced actuators
- Heavier than an individual valve (lower overall weight than the same number of individual valves), which may make mounting on moving systems or in very tight installation spaces difficult
- Longer tube lengths are occasionally required, ruling out the possibility of optimum pneumatic performance

Decentralised pneumatic connection (individual valve/valve on individual sub-base)



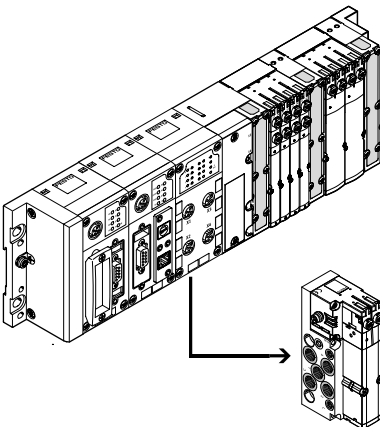
Benefits

- Can be positioned directly at the actuator, can even be integrated
- Short tubing length to the actuator enables short switching times
- Optimum pneumatic control times and performance

Disadvantages

- Air supply per valve requires more tubing
- Serial electrical links not advisable/possible
- More complex electrical installation

Central electrical connection (multi-pin/fieldbus connection/standalone mini control system)



Benefits

- Internal electrical links require less cabling
- Increased transparency
- Material, weight and cost savings
- Ideal for connecting a large number of closely spaced valves

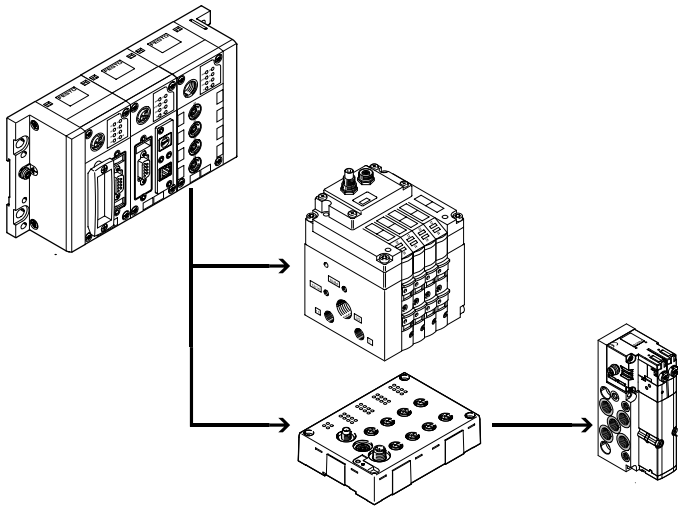
Disadvantages

- Not suitable for individual, more widely spaced applications due to more complex cabling
- More complex individual components (cables, fieldbus modules)

Peripherals overview

Integration of the installation system CPI in various connection concepts

Decentralised electrical connection (CPI system/individual valve/valve on individual sub-base/valve manifold assembly)



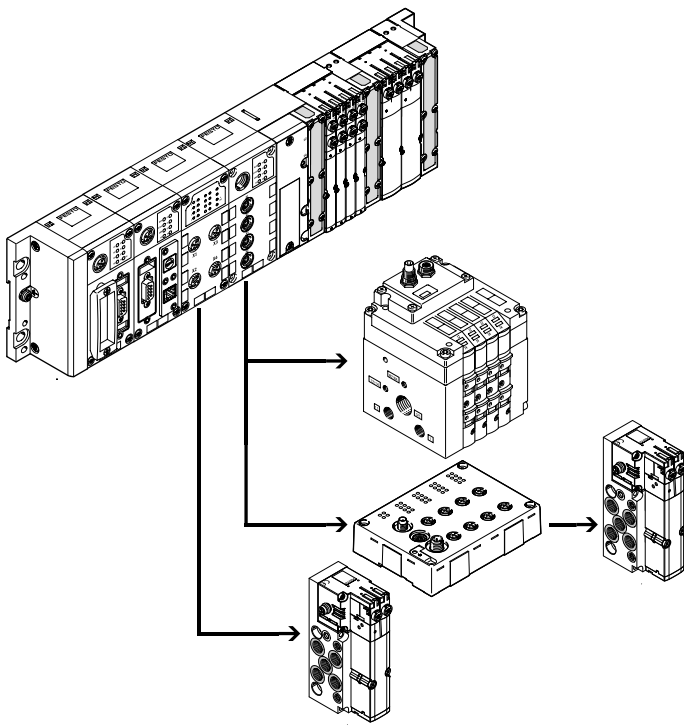
Benefits

- CPI system with reduced installation effort for groups of actuators/sensors
- Different levels of complexity with widely separated individual components
- Components can be easily replaced during servicing
- Optimum pneumatic control times and performance

Disadvantages

- Limited spatial expansion possible (CPI system up to 10 m, AS-Interface up to 100 m)
- High installation costs

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



Benefits

- Scalable to different requirements within a system
- One control interface in the system, reduces installation complexity with closely and widely spaced actuators
- Enables an optimum electrical and pneumatic control chain

Disadvantages

- The application must at least partially meet the requirements of a centralised connection

Connecting the CPI installation system to a higher-order controller

Bus node/Industrial Ethernet

Different bus nodes are used for integration in the control systems of various manufacturers.

The CPI system can therefore be operated via more than 90% of the most commonly used bus systems.

- PROFIBUS
- DeviceNet®
- CANopen
- CC-LINK®
- EtherNet/IP
- PROFINET
- POWERLINK
- EtherCAT®
- Sercos III

Control block

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

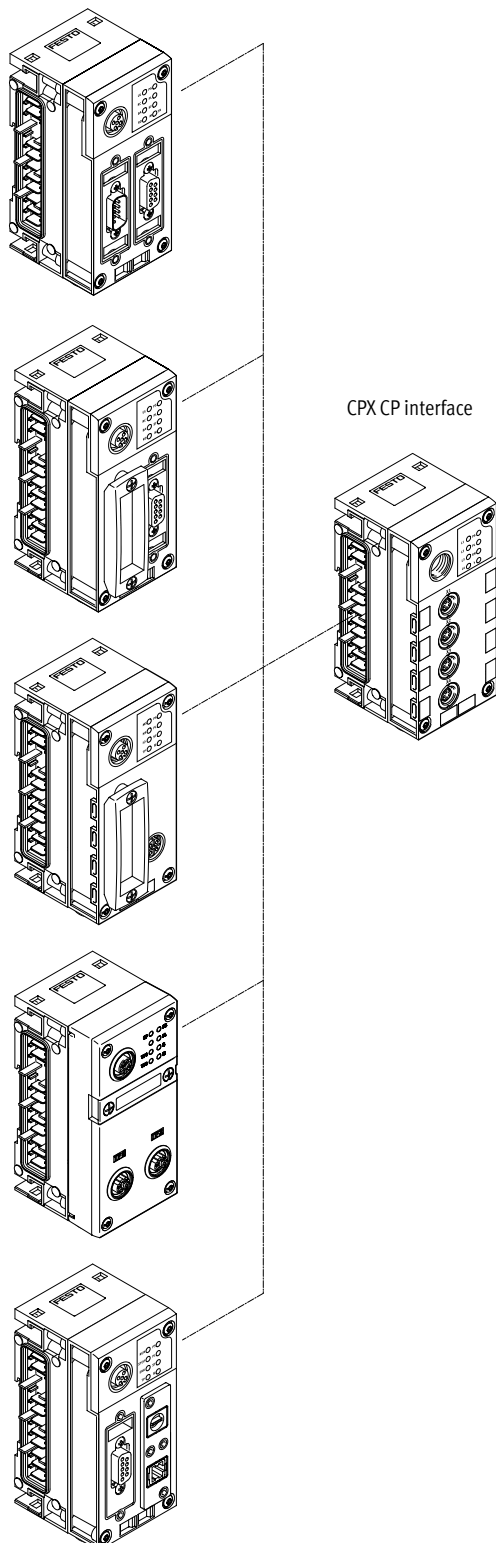
- Ethernet
- TCP/IP
- Web

Peripherals overview

Connecting the CPI installation system to a higher-order controller

Overview

CPX bus node/control block



CPX CP interface

The precise technical data and specifications for CPX can be found online at:

→ Internet: cpx

Bus protocol/bus node

DeviceNet®

FB11

- Up to 512 digital inputs/outputs
- 18 analogue inputs/outputs

PROFIBUS DP

FB13

- Up to 512 digital inputs/outputs
- 18 analogue inputs/outputs

CANopen

FB14

- Up to 64 digital inputs and 64 digital outputs
- 8 analogue inputs and 8 analogue outputs

CC-LINK®

FB23-24

- Up to 512 digital inputs/outputs
- 32 analogue inputs/outputs

EtherNet/IP

FB36

- Up to 128 digital inputs/outputs
- 8 analogue inputs/outputs

PROFINET

FB43

- Up to 512 digital inputs/outputs

FB44

- 32 analogue inputs/outputs

FB45

EtherCAT®

FB37

- Up to 512 digital inputs/outputs
- 32 analogue inputs/outputs

POWERLINK

FB40

- Up to 512 digital inputs/outputs
- 32 analogue inputs/outputs

Sercos III

FB39

- Up to 512 digital inputs/outputs
- 32 analogue inputs/outputs

Peripherals overview

Connecting modules in the installation system CPI

CP interface as part of the CPX terminal

Using the CP interface as a module of the CPX terminal makes it easier to progress from the CP system to the CPI system.

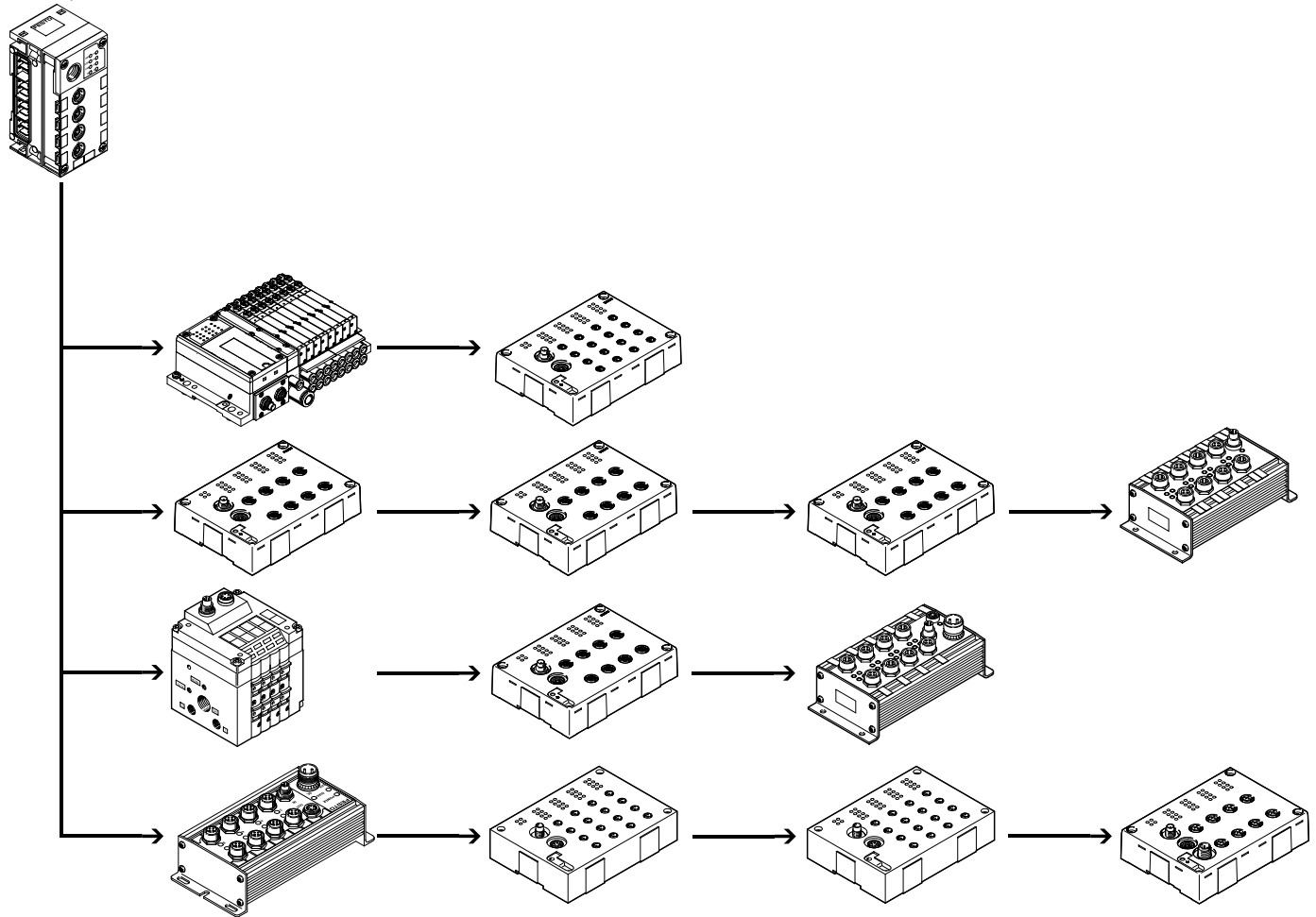
All CP modules are both upwards and downwards compatible and can therefore be used in both the CP system and the CPI system.

This extension has doubled the scalability and range of CP modules that can be used:

- 4 CP strings
- Up to 4 modules per string
- Up to 32 inputs and outputs per CP string

An added advantage of the CPI system is its extremely user-friendly access options via the CPX bus node and the CPX-CEC:

- Data preprocessing
- Diagnostics via software
- Reading out of status information
- Indication via permanently installed or mobile display
- Remote maintenance with CPX-CEC and Ethernet connection



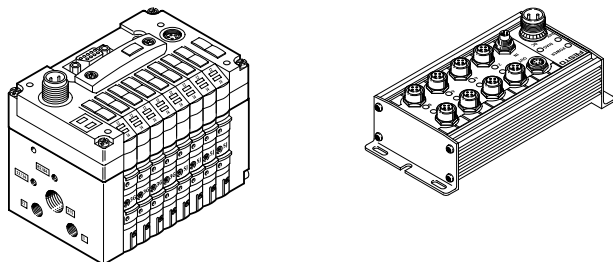
Connection options

Fieldbus Direct			
Special feature	Application	Characteristics of Fieldbus Direct	
The Fieldbus Direct product range is the most compact way of connecting valves to a fieldbus. The bus node is directly integrated in the electrical interface of the valve terminal and therefore takes up only a minimal amount of space.	Fieldbus Direct is a system for the compact connection of a valve terminal to different bus standards. The CP string extension option enables the functions and components of the CPI installation system to be used.	• Extremely compact and space-saving design • Low-cost solution for connecting a small number of valves to the fieldbus • Direct front-end integration with a high degree of protection IP65 • Comprehensive diagnostics and condition monitoring	 Note Detailed description of the range of functions and combination options of CPV valves → Internet: cpv (valve terminal CPV)
Fieldbus Direct and CP string extension			
The optional string extension allows a further valve terminal and I/O modules to be connected to the Fieldbus Direct bus node: • A CP string of the CP system is integrated in the bus node as an extension. • Various input and output modules as well as valve terminals can be connected.	The maximum length of the CP string extension is 10 metres, which means that the extension modules can be mounted directly on site. All of the required electrical signals including load current supply are transmitted via the CP cable, which in turn means that no further installation is needed on the extension module.	The CP string interface offers: • Max. 32 input signals • Max. 32 output signals for output modules 24 V DC or solenoid coils • Logic and sensor supply for the input modules	• Load voltage supply for the valve terminal • Logic supply for the output module

Connection options

Fieldbus Direct with CP string extension

CPV valve terminal



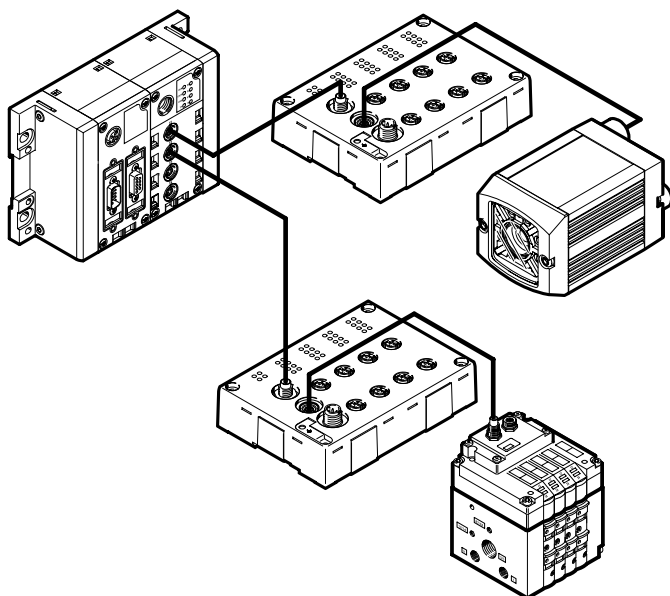
- 4 to 8 valve positions
- DeviceNet®

- 4 to 16 solenoid coils

More information

→ Internet: cpv

Compact vision system SBOC-Q/SBOI-Q with CP interface



The compact vision system SBOx-Q can be integrated into a Festo CPI network. In this case it functions like a binary module with 16 inputs and 16 outputs.

- Address requirement: 16 digital inputs/outputs
- CPI connection

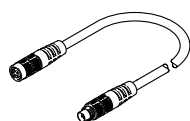
More information

→ Internet: sboc-q, sbqi-q

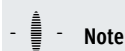
Connection options

Connecting inputs and outputs in the CPI installation system

CP connecting cable



KVI-CP-3-...



Note

The total length of all CP cables in a CP string must not exceed 10 m.

- Pre-assembled cables for connecting the CP modules
- Lengths from 0.25 to 8 metres
- M9 plug/socket, 5-pin
- Straight/angled version in any combination

More information
→ Internet: kvi-cp

CP input/output modules in sturdy, universal design or as valve terminal

Input and output modules with different electrical interfaces are available for connecting sensors and actuators:

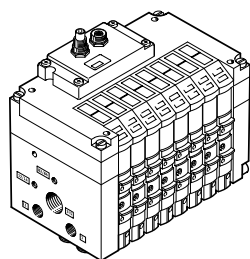
- M12-5POL
- M8-3POL
- M8-4POL

The maximum number of inputs/outputs that can be connected to the individual modules can vary depending on the application. The following module sizes are available:

- Input modules with 8, 16 or 32 channels
- Output modules with 4 or 8 channels
- CPV with 4, 6 or 8 valve slices (max. 16 valves)
- MPA-S with 2 ... 32 valves

Valve terminals with CP interface

CPV valve terminal

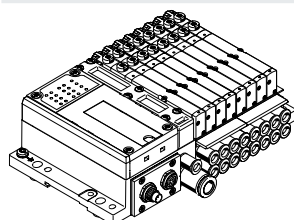


CPV10
CPV14
CPV18

- Max. 16 valves in 8 valve slices
- Extremely compact/space-saving
- Width 10, 14, 18 mm
- Nominal flow rate 400/800/1600 l/min
- CPV10 and CPV14 with CPI functionality
- CPV18 with CP functionality

More information
→ Internet: cpv
(valve terminal CPV)

Valve terminal MPA-S

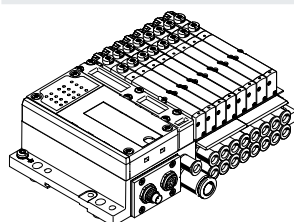


MPA1
MPA14
MPA2

- Max. 32 valves (32 solenoid coils, 16 valve positions)
- Modular and versatile
- Width 10, 14, 20 mm
- Nominal flow rate 360/550/700 l/min
- CPI functionality

More information
→ Internet: mpa-s
(valve terminal MPA-S)

Valve terminal MPA-S

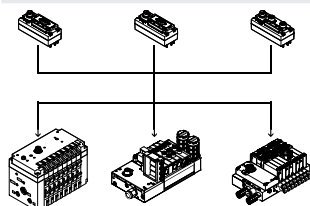


CPV-SC

- Max. 16 valves
- Extremely compact
- Width 10 mm
- Nominal flow rate 170 l/min
- CPI functionality

More information
→ Internet: cpv-sc
(valve terminal CPV-SC)

Valve terminal with I-Port interface



Valve-Terminals:

- VTOC
- VTUB-12
- CPV
- MPA-L
- VTUG

Flow

- 10 l/min
- 400 l/min
- 400/800 l/min
- 360/670/700 l/min
- 130 ... 1200 l/min

More information
→ Internet: vtoc
→ Internet: vtub-12
→ Internet: cpv
→ Internet: mpa-l
→ Internet: vtug
→ Internet: cteu

Key features – Input/output modules

Connecting inputs and outputs in the CPI installation system

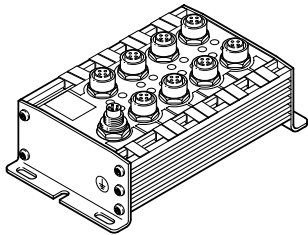
Special features of the CP I/O modules in sturdy design

The sturdy CP I/O modules have a highly resistant aluminium housing and their internal electronic components can be repaired or replaced.

CP-E...Z or output modules have a separate load voltage supply, which means less load on the CP interface and CP cable and more power for the connected consuming devices.

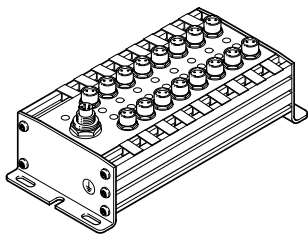
This also makes it easier to disconnect the consuming devices separately.

CP input modules in sturdy design



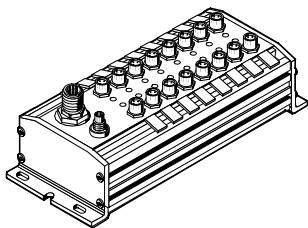
CP-E16-M12x2-5POL

- 16 inputs 24 V DC
- Signal status indication via 16 LEDs
- Operating status indication
- CP functionality
- M12 plug, double assignment
- 1x M9 CP connection
- PNP/NPN, IP65



CP-E16-M8

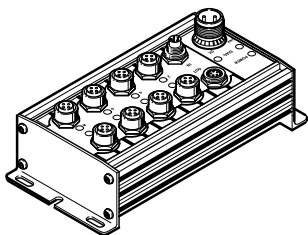
- 16 inputs 24 V DC
- Signal status indication via 16 LEDs
- Operating status indication
- CP functionality
- M8 plug, single assignment
- 1x M9 CP connection
- PNP/NPN, IP65



CP-E16-M8-Z

- 16 inputs 24 V DC
- Signal status indication via 16 LEDs
- Operating status indication
- CP functionality
- Galvanic isolation through additional power supply
- M8 plug, single assignment
- 1x M9 CP connection
- Separate sensor supply
- PNP/NPN, IP65

CP output modules in a sturdy design



CP-A08-M12-5POL

- 8 outputs 24 V DC
- Output signal indication via 8 LEDs
- Operating status indication
- M12 plug, single assignment
- CP functionality
- 2x M9 CP connection
- Separate load voltage
- Outputs resistant to overloads and short circuits
- PNP, IP65

Key features – Input/output modules

Connecting inputs and outputs in the CPI installation system

Special features of the CP I/O modules in economical design

In addition to the sturdy CP I/O modules, there are also economical modules with a greater number of inputs/outputs.

The economical CP modules are characterised by a compact design combined with a large number of inputs/outputs.

The modules can be used in conjunction with the following valve terminals:

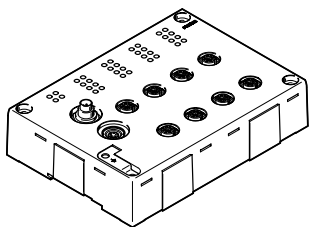
- CPV, MPA-S, CPV-SC

Application:

- Same function, configuration and commissioning as sturdy CP modules
- Integrated DIN rail mounting and earthing plate
- Centrally positioned status and diagnostic LEDs
- The economic CP modules and the other CP modules can be operated together on a string

- The maximum number of modules per CP string is as follows:
 - CPI system: max. 4 modules or max. 32 inputs and 32 outputs
 - CP system: one valve terminal/output module and one input module

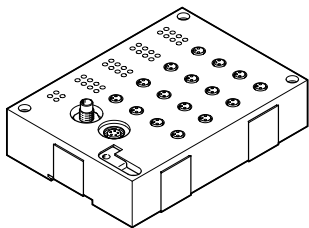
CP input modules in economical design



CP-E16-M12-EL

- 16 inputs 24 V DC
- Signal status indication via 16 LEDs
- Operating status indication (per module and per group of 4 inputs)
- CPI functionality

- 8x M12 plug, 5-pin, double assignment
- 2x M9 CP connection
- PNP, IP65

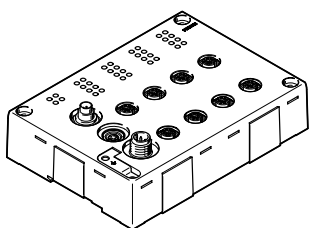


CP-E16-M8-EL

- 16 inputs 24 V DC
- Signal status indication via 16 LEDs
- Operating status indication (per module and per group of 4 inputs)
- CPI functionality

- 16x M8 plug, 3-pin, single assignment
- 2x M9 CP connection
- PNP, IP65

CP output modules in economical design



CP-A08-M12-EL-Z

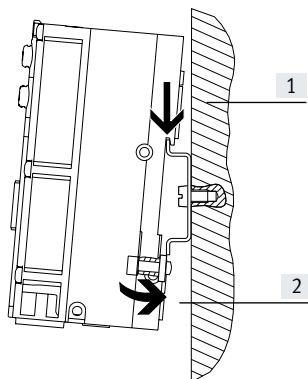
- 8 outputs 24 V DC
- Signal status indication via 4 LEDs
- Operating status indication (per module and per channel/output)
- CPI functionality

- 8x M12 plug, 5-pin, double assignment
- 2x M9 CP connection
- Outputs resistant to overloads and short circuits
- PNP, IP65

Key features – Mounting options

DIN rail mounting

CP interface



The DIN rail mounting is part of the rear profile of the CPX interlinking blocks. The CPX terminal can be attached to the DIN rail using the DIN rail mounting kit.

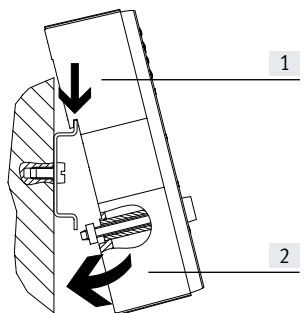
The CPX terminal is first hooked onto the DIN rail (see arrow 1), then swivelled onto the DIN rail and secured in place with the clamping element (see arrow 2).

The following mounting kit is required for DIN rail mounting (plus mounting kit for optionally mounted valves):

- CPX-CPA-BG-NRH

This enables mounting on DIN rails to EN 60715.

Economical CP modules



The DIN rail mounting is part of the reverse profile of the economical CP modules. The modules can be attached to the DIN rail using the DIN rail mounting.

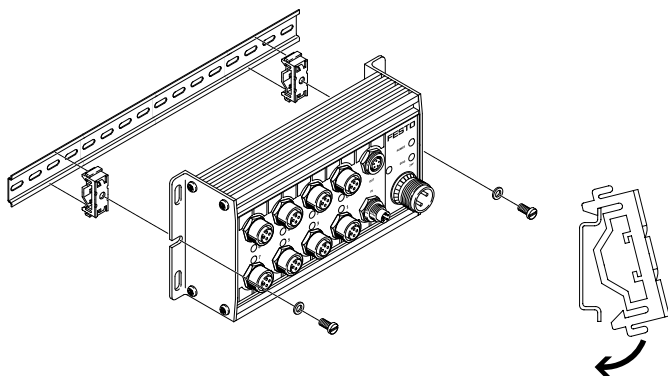
The module is first hooked onto the DIN rail (see arrow 1), then swivelled onto the DIN rail and secured in place with the clamping element (see arrow 2).

The following mounting kit for DIN rail mounting is included in the scope of delivery:

- CP-EL-HS

This enables mounting on DIN rails to EN 60715.

Sturdy CP modules



For the CP modules there is a mounting kit that can be used on a DIN rail.

The following mounting kit is required for DIN rail mounting:

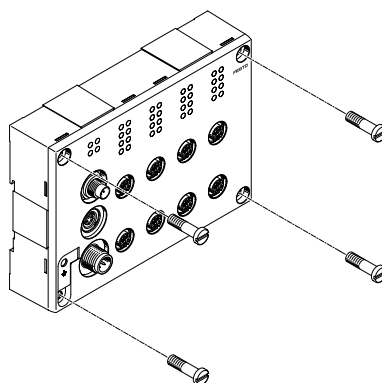
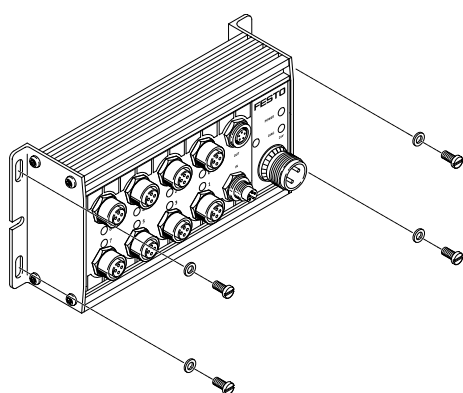
- CP-TS-HS35

This enables mounting on DIN rails to EN 60715.

Key features – Mounting options

Wall mounting

CP modules



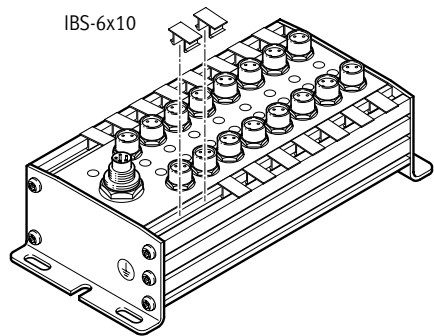
The CP modules (with screws up to 4 mm in diameter) can be mounted on even surfaces in almost any position using the mounting holes.

Key features – Inscription system

Inscription system

All CP modules have holders for inscription labels.	Inscription labels/label holders are not included in the scope of delivery and can be ordered separately.	The labels can be pre-assembled on request.
---	---	---

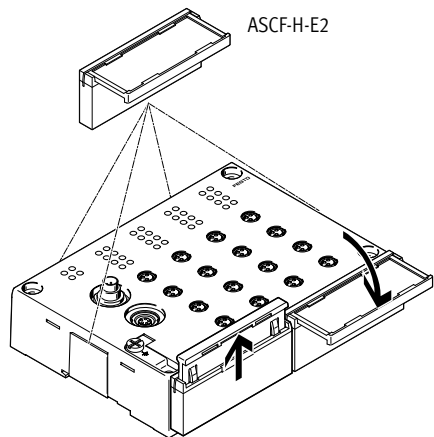
Sturdy CP modules



The sturdy CP modules have two slots in which the inscription labels IBS-6x10 (part no. 18576) can be fitted. At least one inscription label can be fitted for each connection.

The IBS-6x10 are plastic clips that can be printed on, written on or affixed with labels.

Economical CP modules



The economical CP modules have six fixtures on the side, each for one inscription label holder ASCF-H-E2 (part no. 547473).

The ASCF-H-E2 are transparent, hinged inscription label holders for holding premade paper inscription labels. The label can be read when the label holder is opened out.

Key features – Power supply

Operating voltage and load current supply

The following functions are made available to the connected modules via the CP cable:

- Connection for data exchange
- Operating voltage for the internal electronics
- Load current supply for the connected inputs/sensors or outputs/actuators

CP-E...Z, or output modules have a separate load voltage supply:

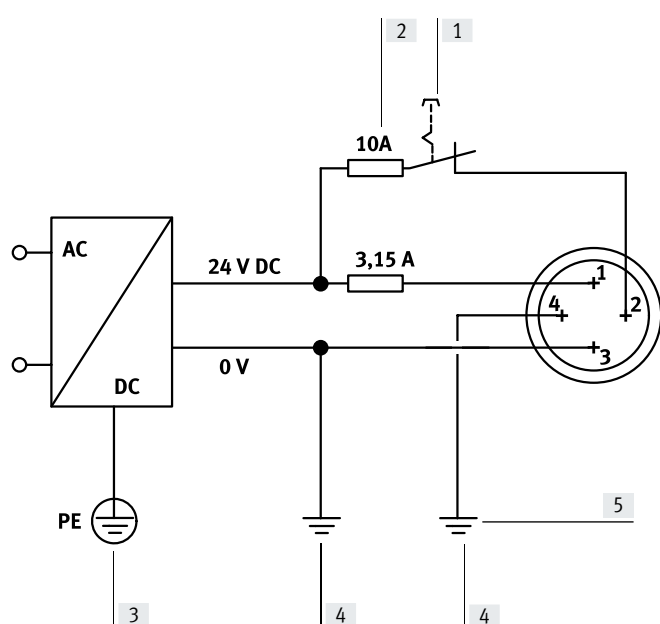
- Reduced load on the CP interface and the CP cable
- 0.5 A per output (max. 4 A supply per output module)
- 1 A per 8 inputs
- Separate disconnection of the consuming devices possible

Every module in the CPI system is protected separately against overload with electronic fuses.

The input modules without additional supply provide a maximum sensor supply of 500 mA in the sturdy design, and 700 mA in the economical design with 16 inputs and 1400 mA with 32 inputs.

The input modules with additional supply provide up to 2 A aggregate current for the connected sensors.

Example of circuits for additional power supply

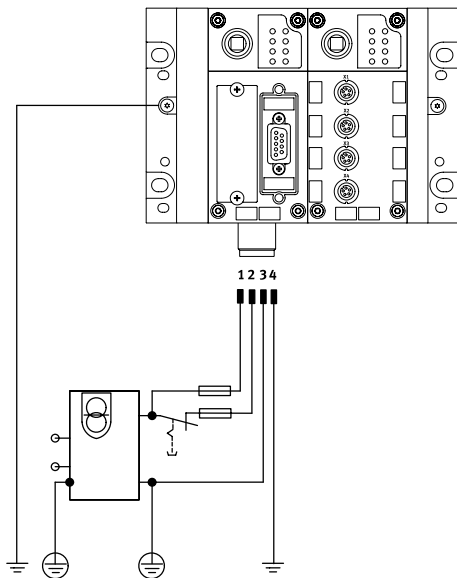


- [1] Load voltage supply (can be disconnected separately)
- [2] External fuses
- [3] PE
- [4] Equipotential bonding
- [5] Earth connection pin 4, designed for 12 A

Key features – Power supply

Power supply concept of the CPX terminal

Circuit diagram for M18 power supply/system supply (example)



The use of decentralised devices on the fieldbus – particularly with a high degree of protection for direct mounting on the machine – requires a flexible power supply concept. The CPX terminal makes it easier to connect all voltages via one socket.

A distinction is made between supply for

- Electronics and sensors/inputs
- Valves
- Actuators/outputs

Choice of connection technology:

- M18
- 7/8"
- AIDA push-pull



Note

The CP interface connects the 0 V of the power supply for the electronics/inputs and the valves.

To prevent overloads, the power must therefore be supplied using just one power supply module or using power supply units with a common PEN conductor.

Interlinking blocks

Many applications require the voltage to be segmented into zones. This applies in particular to the separate disconnection of connected actuators (solenoid coils/outputs).

The separation of voltages for valves and the creation of different voltage segments for electrical outputs and sensors are supported by the different interlinking blocks of the CPX terminal:

- With system supply
- Without power supply
- With additional power for electrical outputs
- With additional supply for valves

The supply voltages are supplied using a

- 4-pin M18 plug
- 4-pin 7/8" plug
- 5-pin 7/8" plug
- AIDA push-pull, 5-pin



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.

Key features – Diagnostics

General limit values

System supply

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

- Max. 16 A for electronics and sensors/inputs
- Max. 16 A for actuators/outputs and valves

CP interface

The CP interface and the CP modules connected to the CP interface get their operating voltage from the connection for electronics and sensors/inputs.

The operating voltage for the sensors/actuators connected to the CP modules is supplied from the voltage for valves.

The CP interface supplies the connected CP modules with

- Max. 1.6 A per CP string

Diagnostics

General

A comprehensive diagnostic function is available for each string.

The diagnostic information can either be detected via the LEDs on the module and then read out and evaluated via the controller software (non-fieldbus-specific) or displayed directly on the CPX terminal via the diagnostic interface and then evaluated and processed.

Diagnostics via LED

- Error in bus communication
- POWER, power supply indicator for internal electronics
- POWER V, load voltage indicator for valves
- 0 ... 3, CP string assignment changed or interrupted

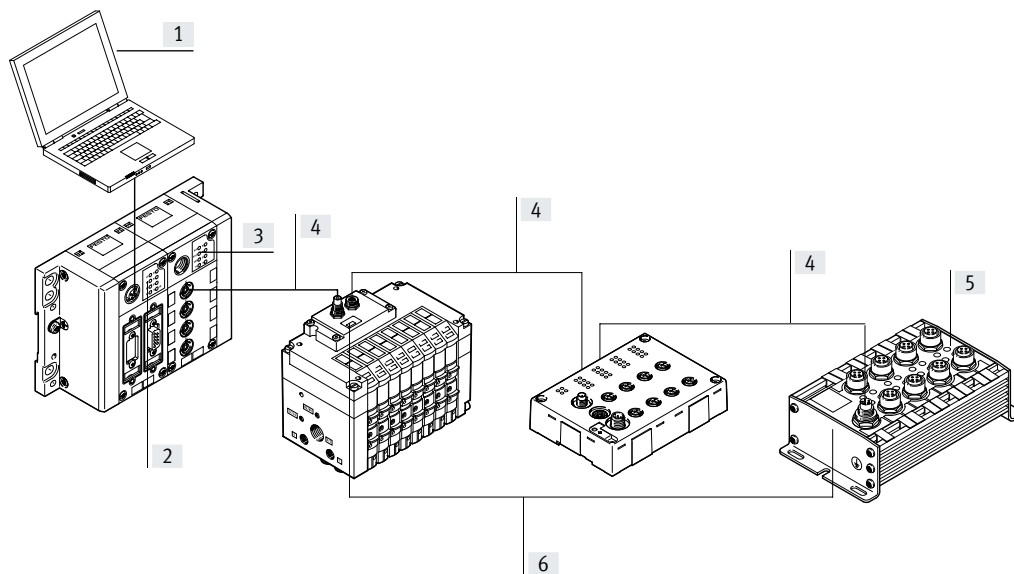
Bus-specific LED displays are also available.

Diagnostics via control program

- Configuration error
- Bus error
- Operating voltage failure
- Falling below voltage tolerance (valves)
- Short circuit in sensor voltage supply

- Operating voltage failure at the output modules
- Short circuit/overload at the output modules
- Connection to one or more CP modules interrupted (valve terminal, input/output modules)

Diagnostics via CPX terminal

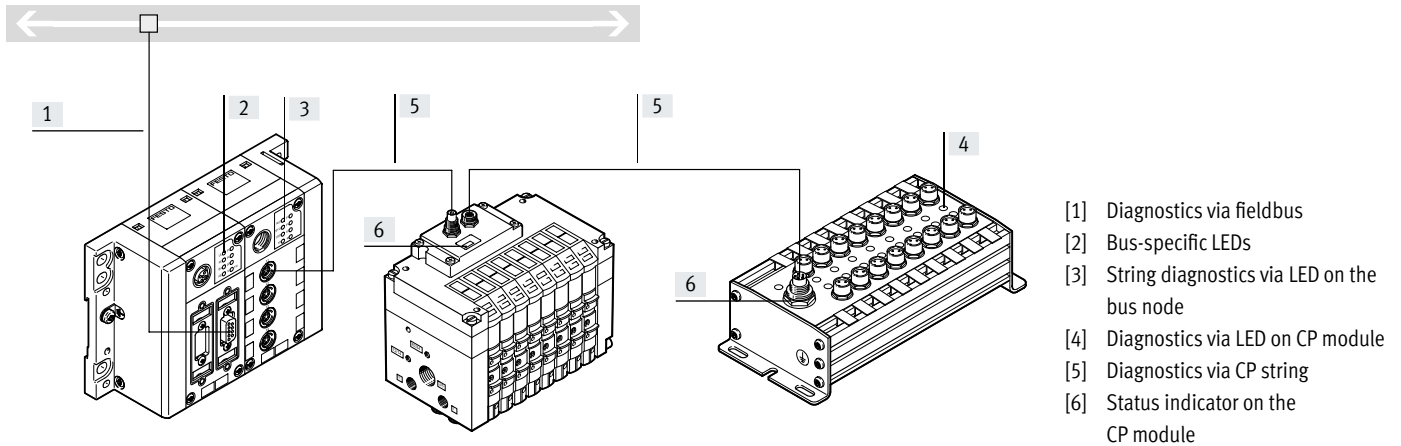


- [1] Diagnostics via controller/ bus node
- [2] Bus-specific LEDs
- [3] String diagnostics via LED on the CP interface
- [4] Diagnostics via CP string
- [5] Diagnostics via LED on CP module
- [6] Status indicator on the CP module

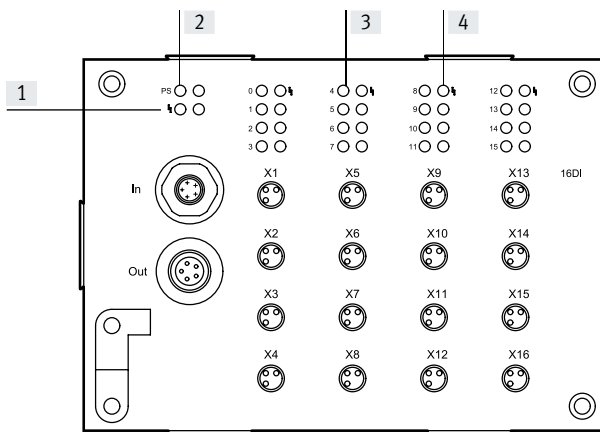
Key features – CP interface

Diagnostics

Diagnostics via CP bus node



Diagnostic LEDs on the CP modules



- [1] Status LED
CP communication
(PS, green)
- [2] Status LED (module) for short
circuit/overload of sensor supply
(red)
- [3] Status LEDs for inputs (status
indication, green)
- [4] Status LED (group, only with
CP-E16-...-EL) for short circuit/
overload of sensor supply (red)

In addition to the status indication per module and per individual channel/ input, the economical modules with 16 inputs additionally have a status indication for a group of four inputs.

The following inputs are combined into groups of four:

- 0 ... 3
- 4 ... 7
- 8 ... 11
- 12 ... 15

Parameterisation

The addresses to the individual actuators/outputs or sensors/inputs, which are connected to the CP modules, are allocated in accordance with the bus node or CPX-CEC used (exception: INTERBUS node).

Addresses are allocated according to the following rules:

- One CP interface provides four strings with a total of 128 input and 128 output addresses.
- A used string occupies 32 input and 32 output addresses.
- The addresses are permanently allocated to the strings and CP modules in ascending order.
- Unused address space remains reserved for later extensions.

The CP interface checks the configuration of the connected modules each time the system is switched on and during operation. If a deviation from the saved configuration is detected, a corresponding message is sent via the control software and displayed via LED. The configuration detected is stored by pressing the Save button (after the operating voltage is switched on at the CP interface).

The configuration is stored each time the CP interface is switched off and back on.

There is an option to replace a connected CP module with an identical module during operation. Removal of more than one module from the current configuration will be detected as an error; the address spaces of these modules will no longer be actuated.

Selection aid

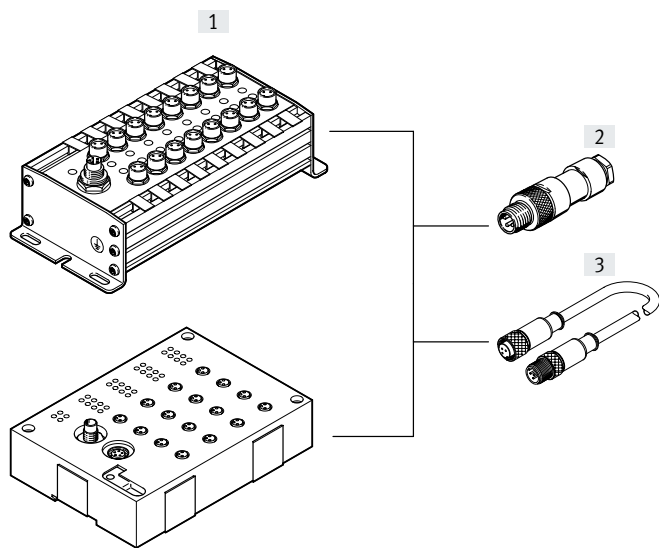
System selection aid	Modules per string	Outputs/inputs per string	Modules with CP functionality	Modules with CPI functionality	String length [m]
CP system	2	16/16	0 ... 1 input module 0 ... 1 output module	0 ... 1 input module 0 ... 1 output module	0 ... 10
CPI system	4	32/32	0 ... 1 input module 0 ... 1 output module	0 ... 4 input modules 0 ... 4 output modules	0 ... 10

Module selection aid	Functionality		Auxiliary power supply	Address requirement		Max. current consumption [A]	→ Page/Internet
	CP	CPI		Inputs	Outputs		
Input modules							
CP-E16-M8	■	–	–	16	–	0.54	26
CP-E16-M12x2-5POL	■	–	–	16	–	0.59	26
CP-E16-M8-Z	■	–	■	16	–	1.04	27
CP-E16-M8-EL	■	■	–	16	–	0.7	32
CP-E16-M12-EL	■	■	–	16	–	0.7	32
Output modules							
CP-A08-M12-5POL	■	–	■	–	8	2.09	43
CP-A08-M12-EL-Z	■	■	■	–	8	4	46
Connecting cables							
KVI-CP-3-...	■	■	–	–	–	1.6	kvi-cp
Valve terminals							
CPV10-FB-4	■	■	–	–	16	0.327	cpv
CPV10-FB-6	■	■	–	–	16	0.465	cpv
CPV10-FB-8	■	■	–	–	16	0.604	cpv
CPV14-FB-4	■	■	–	–	16	0.419	cpv
CPV14-FB-6	■	■	–	–	16	0.603	cpv
CPV14-FB-8	■	■	–	–	16	0.788	cpv
CPV18-FB-4	■	–	–	–	16	0.624	cpv
CPV18-FB-6	■	–	–	–	16	0.911	cpv
CPV18-FB-8	■	–	–	–	16	1.197	cpv
MPA-S	–	■	■	–	32	3.25	mpa-s
CPV-SC	–	■	–	–	16	0.875	cpv-sc
CTEU-CP	–	■	–	0/16/32	0/16/32	3.4	54

Selection aid

Accessories selection aid

Connection M8, 3-pin



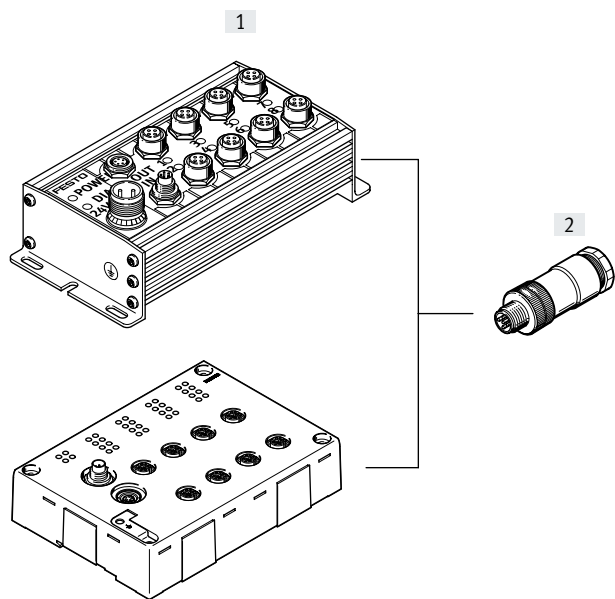
Note

Festo delivers pre-assembled connecting cables M8/M12 (modular system NEBA) on request:

- Tailored to the application
- Perfect fit
- Easy to install

[1] Input modules		Plug/connecting cable	
Type		Type	Connection technology
CP-E16-M8		[2] Plugs	
CP-E16-M8-Z		NECB-S-M8G3-C2	Screw terminal
CP-E16-M8-EL			
		[3] Connecting cable	
		NEBA-...-M8G3	Socket M8, 3-pin
			Socket M8, 4-pin
			Socket M12, 5-pin
			Open cable end

Connection for inputs M12, 5-pin

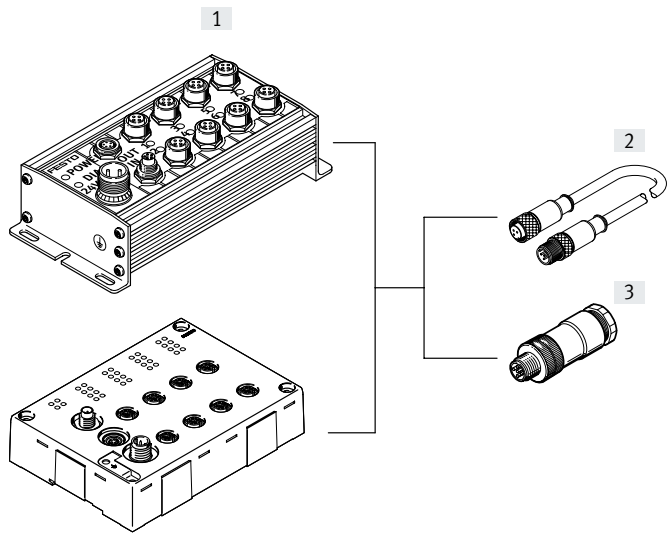


[1] Input modules		[2] Plugs	
Type		Type	Connection technology
CP-E16-M12x2-5POL		NECB-S-M12G5-C2	Screw terminal
CP-E16N-M12-EL		NECB-S-M12G5-C2-D	Screw terminal

Selection aid

Accessories selection aid

Connection for outputs M12, 5-pin



[1] Output modules		Plug/connecting cable	
Type		Type	Connection technology
CP-A08-M12-5POL		[2] Connecting cable	
CP-A08-M12-EL-Z		NEBA-...-M12G5	Socket M12, 5-pin
CP-A04-M12-CL		(Modular system for choice of connecting cables)	Open cable end
		[3] Plugs	
		NECB-S-M12G5-C2	Screw terminal
		NECB-S-M12G5-C2-D	Screw terminal

Datasheet – Input modules CP-E16

Function

Digital input modules make it easier to connect proximity switches or other 24 V DC sensors (inductive, capacitive, etc.).
M12 plugs with double assignment are separated using a sensor/actuator distributor.

 Repair service
CP-E16-M8
CP-E16-M8-Z

Application area

- Input modules for 24 V DC sensor signals
- M8 and M12 plugs, single assignment with 16 connections, double assignment with 8 connections
- M12 plug, 5-pin
- The input statuses for each input signal are indicated via an assigned LEDs.
- 24 V DC supply provided for all connected sensors
- Diagnostic LED for short circuit/undervoltage of sensor supply.
- Diagnostic LED for short circuit/interruption of external sensor supply with CP-E-16-M8-Z.



General technical data				
Type			CP-E16-M8 Positive switching	CP-E16-M12x2-5POL Positive switching
Number of inputs			16	
Input assignment			Single assignment	Double assignment
Sensor connection type			16x M8, 3-pin	8x M12, 5-pin
Power supply 24 V DC			From the bus node	
Intrinsic current consumption of electronics		[mA]	40	90
Input current at 24 V DC (from sensor)		[mA]	Typically 8	Typically 6
Fuse protection for sensors and electronics modules			Internal electronic short-circuit protection	
Max. current consumption of sensor supply, total current		[A]	Max. 0.5	
Supply voltage for sensors		[V DC]	24 ±25%	
Reverse polarity protection			For logic and sensor voltage	
Galvanic isolation			None	
Switching level	Signal 0	[V]	≤5	≤6
	Signal 1	[V]	≥11	≥8.6
Input delay		[ms]	Typically 5	Typically 3
Switching logic			PNP	PNP
Input characteristic curve			To IEC 1131-2	
Connection to the bus node			Via pre-assembled cables	
Degree of protection to EN 60529			IP65 (when fully plugged in or fitted with protective cover)	
Temperature range	Operating	[°C]	−5 ... +50	
	Storage	[°C]	−20 ... +70	
Material			Die-cast aluminium	
LABS (PWIS) conformity			VDMA24364-B2-L	
Dimensions		[mm]	148.9 x 66 x 47.9	140.9 x 78 x 55.2
Weight		[g]	400	500

Datasheet – Input modules CP-E16

General technical data					
Type		CP-E16-M8-Z Positive and negative switching			
Number of inputs		16			
Input assignment		Single assignment			
Sensor connection type		16x M8, 3-pin			
Power supply 24 V DC		From the bus node, connection for additional sensor supply			
Intrinsic current consumption of electronics		[mA]	40		
Input current at 24 V DC (from sensor)		[mA]	Typically 8		
Fuse protection for sensors and electronics modules		Electronic short-circuit protection per group			
Max. current consumption of sensor supply, total current		[A]	Max. 1 per group of 8 inputs		
Supply voltage for sensors		[V DC]	24 ±25%		
Reverse polarity protection		For logic and sensor voltage			
Galvanic isolation		None			
Switching level		PNP		NPN	
		Signal 0	[V]	≤6	≥−8.6
		Signal 1	[V]	≥8.6	≤−6
Input delay		[ms]	typ. 3		
Switching logic		PNP/NPN			
Input characteristic curve		To IEC 1131-2			
Connection to the bus node		Via pre-assembled cables			
Degree of protection to EN 60529		IP65 (when fully plugged in or fitted with protective cover)			
Temperature range		Operating	[°C]	−5 ... +50	
		Storage	[°C]	−20 ... +70	
Material		Die-cast aluminium			
LABS (PWIS) conformity		VDMA24364-B2-L			
Dimensions		[mm]	216.9 x 66 x 50.6		
Weight		[g]	420		

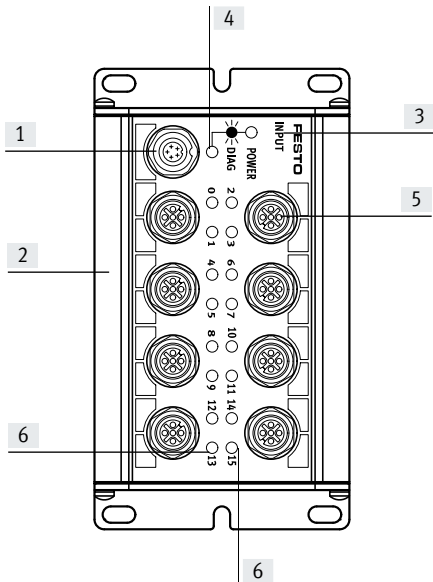
Certifications	
Type	CP-E16-M...
ATEX category for gas	II 3G
Type of (ignition) protection for gas	Ex ec IIC T5 Gc X
ATEX category for dust	II 3D
Type of (ignition) protection for dust	Ex tc IIIC T80°C IP65 Dc X
ATEX ambient temperature	[°C] −5 ≤ Ta ≤ +50
Explosion protection certification outside the EU	EPL Dc (GB) EPL Gc (GB)
CE marking (see declaration of conformity)	To EU EMC Directive ¹⁾ To EU Explosion Protection Directive (ATEX) To EU RoHS Directive
UKCA marking (see declaration of conformity)	To UK EMC regulations To UK explosion regulations To UK RoHS regulations
KC marking	KC EMC
Certification	c UL us - Recognized (OL) RCM

1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Datasheet – Input modules CP-E16

Connection and display components
CP-E16-M12x2-5POL



- [1] CP connection
- [2] Slot for identification labels (IBS-6x10)
- [3] Identification of input type: -INPUT-P for PNP inputs
- [4] Status LED (green)
- [5] Sensor connections
- [6] Green LED for status indication (one LED per input)

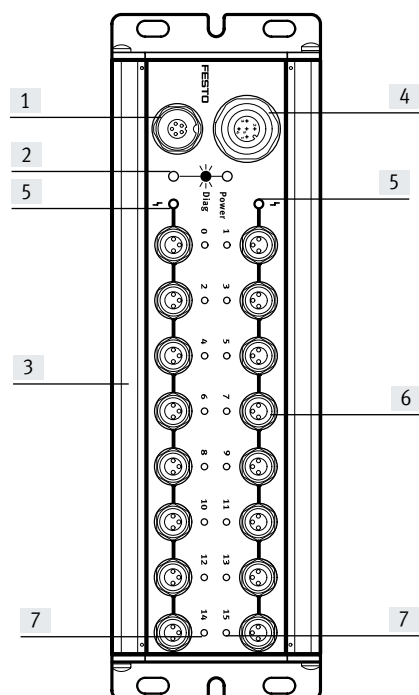
Pin assignment – Sensor connections CP-E16-M12x2-5Pol					
Terminal assignment	Pin	Signal	Designation	Pin	Signal
	1	24 V	Operating voltage 24 V	1	24 V
	2	Ix+1*	Sensor signal	2	Ix+3*
	3	0 V	Operating voltage 0 V	3	0 V
	4	Ix*	Sensor signal	4	Ix+2*
	5	Ground	Earth terminal	5	Ground

* Ix = Input x

Datasheet – Input modules CP-E16

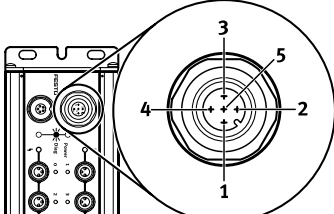
Connection and display components

CP-E16-M8-Z

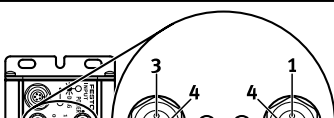


- [1] CP connection
- [2] Status LED (green)
- [3] Slot for identification labels (IBS-6x10)
- [4] Connection for the power supply to the external sensors
- [5] Red LED for indicating short circuit or failure of the sensor voltage (one LED per input group)
- [6] Sensor connections
- [7] Green LED for status indication (one LED per input)

Pin assignment – External sensor supply CP-E16-M8-Z

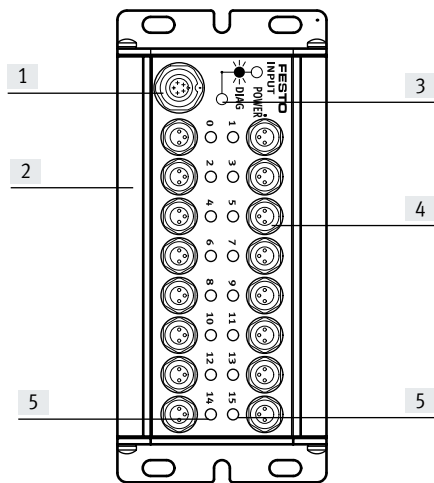
Terminal assignment	Pin	Signal	Designation	 Note External sensor supply for CP-E16-M8-Z: Specified for PNP or NPN operation (type CP-E16-M8-Z). The input module provides PNP or NPN inputs. You can determine either PNP or NPN operation by installing a bridge in the socket of the sensor supply connection.
	1	24 V DC ±25%	Operating voltage	
	2	PNP/NPN	Coding with negative/positive switching: • PNP operation (pin 2 and 3 bridged) • NPN operation (pin 2 and 1 bridged)	
	3	0 V	Operating voltage 0 V	
	4	n.c.	Not connected	
	5	Ground	Earth terminal	

Pin assignment – Sensor connections CP-E16-M8-Z

Terminal assignment	Pin	Signal	Designation	Pin	Signal
	1	24 V	Operating voltage 24 V	1	24 V
	3	0 V	Operating voltage 0 V	3	0 V
	4	Ix*	Sensor signal	4	Ix+1*

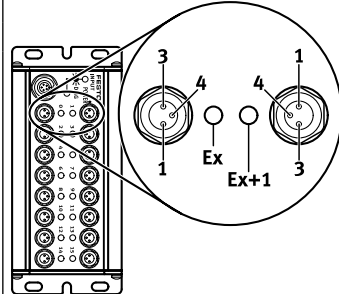
Datasheet – Input modules CP-E16

Connection and display components
CP-E16-M8



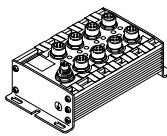
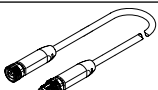
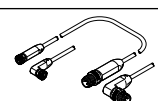
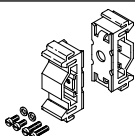
- [1] CP connection
- [2] Slot for identification labels (IBS-6x10)
- [3] Status LED (green)
- [4] Sensor connections
- [5] Green LED for status indication (one LED per input)

Pin assignment – Sensor connections CP-E16-M8

Terminal assignment	Pin	Signal	Designation	Pin	Signal
	1	24 V	Operating voltage 24 V	1	24 V
	3	0 V	Operating voltage 0 V	3	0 V
	4	Ix*	Sensor signal	4	Ix+1*

* Ix = Input x

Accessories – Input modules CP-E16

Ordering data				Part no.	Type
Designation					
Input modules					
	Positive switching			18205	CP-E16-M8
	Positive switching			175561	CP-E16-M12x2-5POL
	Positive and negative switching			189670	CP-E16-M8-Z
Power supply					
	Power supply socket, straight, M12x1, 5-pin			8162291	NECB-M12G5-C2
Sensor plug					
	Straight plug	M8, 3-pin	Screw terminal	8162298	NECB-S-M8G3-C2
		M12, 4-pin	For cable Ø 2.1 ... 7 mm	8162294	NECB-S-M12G4-C2
			For 2x cable Ø 2.1 ... 5.6 mm	8162295	NECB-S-M12G4-C2-D
		M12, 5-pin	For cable Ø 2.1 ... 7 mm	8162296	NECB-S-M12G5-C2
			For 2x cable Ø 2.1 ... 5.6 mm	8162297	NECB-S-M12G5-C2-D
Connecting cables					
	1x socket M8, 3-pin	1x plug M8, 3-pin	0.5 m	★ 8078282	NEBA-M8G3-U-0.5-N-M8G3
			1.0 m	★ 8078283	NEBA-M8G3-U-1-N-M8G3
			2.5 m	★ 8078286	NEBA-M8G3-U-2.5-N-M8G3
			5.0 m	★ 8078287	NEBA-M8G3-U-5-N-M8G3
	Modular system for a choice of connecting cables			–	NEBA-... → Internet: neba
Mounting					
	Mounting, for DIN rail			170169	CP-TS-HS35

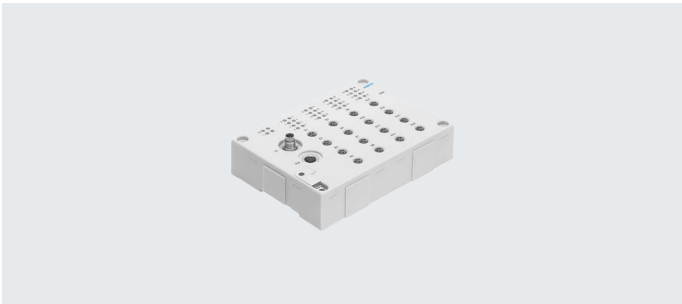
Datasheet – Input modules CP-E...-EL

Function

Digital input modules make it easier to connect proximity switches or other 24 V DC sensors (inductive, capacitive, etc.). Plugs with double assignment are separated using a sensor/actuator distributor.

Application area

- Input modules for 24 V DC sensor signals
- M8 and M12 connection technology
- Indication of the input statuses for each input signal via an assigned LED
- Operating voltage supply 24 V DC for all connected sensors
- Diagnostic LED for short circuit/overload of sensor supply
- Labelling options on all sides with large, hinged inscription label
- Earthing plate and DIN rail mounting already integrated



General technical data			
Type		CP-E16-M12-EL Positive switching	CP-E16-M8-EL Positive switching
Number of inputs		16	
Input assignment		Double assignment	Single assignment
Sensor connection type		8x M12, 5-pin	16x M8, 3-pin
Power supply 24 V DC		Via CP connection	
Intrinsic current consumption at operating voltage		[mA] Typically 75	
Fuse protection (short circuit)		Internal electronic fuse protection for each group	
Max. total current per module		[A] 0.7	
Nominal operating voltage		24	
Operating voltage range		[V DC] 18 ... 30	
Residual ripple load voltage		[Vss] 4	
Galvanic isolation between channels		None	
Switching level	Signal 0	[V]	≤ 6
	Signal 1	[V]	≥ 8.6
Debounce time at inputs		[ms] 3 (0.5 ms, 10 ms, 20 ms parameterisable)	
Switching logic		PNP	
Input characteristic curve		To IEC 1131-T2	
Connection to the bus node		Via pre-assembled cables	
Diagnostics		CP communication	
		Short circuit/overload	
		Undervoltage	
LED indicators		2 Module diagnostics	2 Module diagnostics
		16 Channel status	16 Channel status
		4 Group diagnostics	4 Group diagnostics

Datasheet – Input modules CP-E...-EL

Materials	
Housing	Reinforced PA
Cover	Reinforced PA
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B2-L
Operating and environmental conditions	
Degree of protection to EN 60529	IP65/IP67 (when fully plugged in or fitted with protective cover)
Ambient temperature	[°C] –5 ... +50
Storage temperature	[°C] –20 ... +70
Corrosion resistance class CRC ¹⁾	1
CE marking (see declaration of conformity)	To EU EMC Directive ²⁾
	To EU RoHS Directive ²⁾
UKCA marking (see declaration of conformity)	To UK EMC regulations ²⁾
	To UK RoHS regulations ²⁾
KC marking	KC EMC
Certification	RCM
	c UL us - Listed (OL)

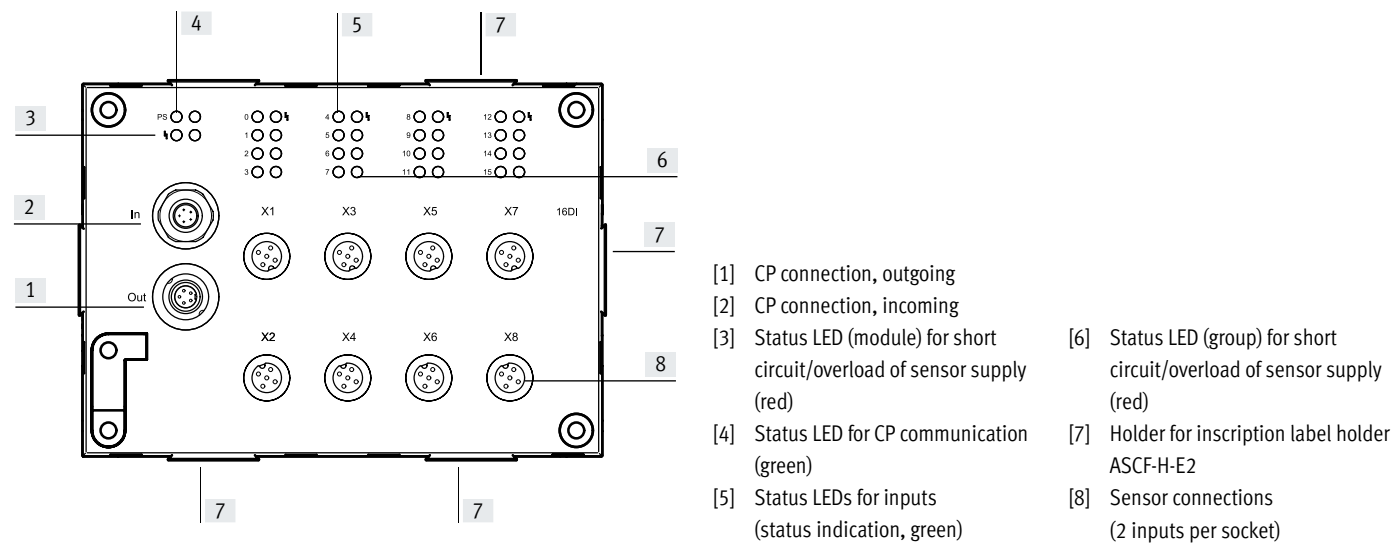
1) More information www.festo.com/x/topic/crc

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.

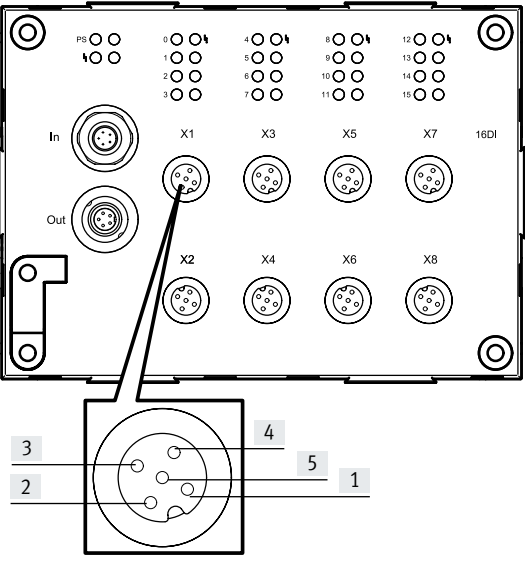
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Datasheet – Input modules CP-E...-EL

Connection and display components
CP-E16-M12-EL



Pin assignment – Sensor connections CP-E16-M12-EL

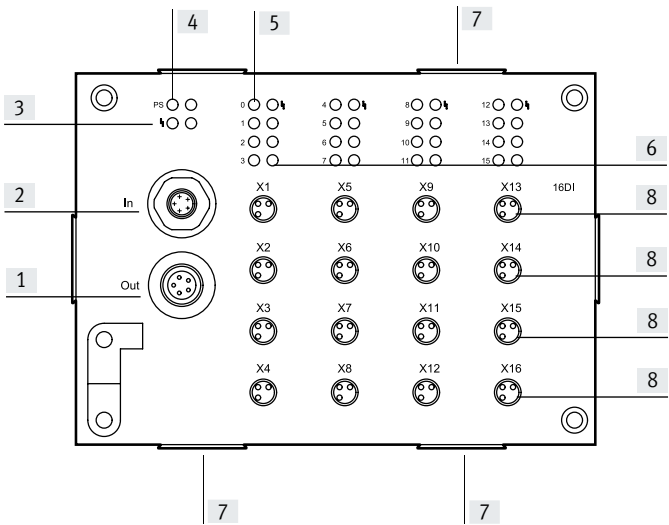
Terminal assignment	Pin	Signal	Designation
	1	24 V	Operating voltage 24 V
	2	Ix+1*	Sensor signal
	3	0 V	Operating voltage 0 V
	4	Ix*	Sensor signal
	5	Ground	Earth terminal

* Ix = Input x

Datasheet – Input modules CP-E...-EL

Connection and display components

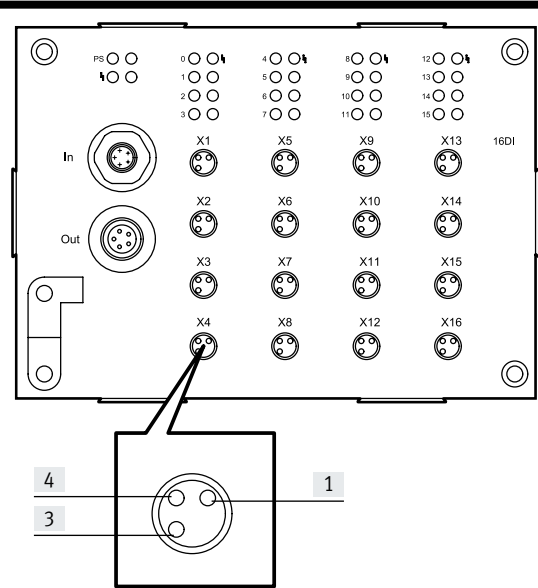
CP-E16-M8-EL



- [1] CP connection, outgoing
- [2] CP connection, incoming
- [3] Status LED (module) for short circuit/overload of sensor supply (red)
- [4] Status LED for CP communication (green)
- [5] Status LEDs for inputs (status indication, green)
- [6] Status LED (group) for short circuit/overload of sensor supply (red)
- [7] Holder for inscription label holder ASCF-H-E2
- [8] Sensor connections (1 input per socket)

Pin assignment – Sensor connections CP-E16-M8-EL

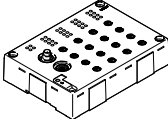
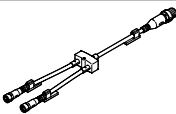
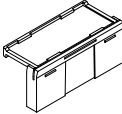
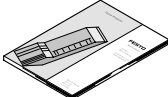
Terminal assignment



Pin	Signal	Designation
1	24 V	Operating voltage 24 V
3	0 V	Operating voltage 0 V
4	Ix*	Sensor signal

* Ix = Input x

Accessories – Input modules CP-E...-EL

Ordering data				Part no.	Type	
Designation						
Input modules						
	Positive switching			546923	CP-E16-M12-EL	
	Positive switching			546922	CP-E16-M8-EL	
Plug						
	Straight plug	M8, 3-pin	Screw terminal	8162298	NECB-S-M8G3-C2	
		M12, 4-pin	For cable Ø 2.1 ... 7 mm	8162294	NECB-S-M12G4-C2	
			For 2x cable Ø 2.1 ... 5.6 mm	8162295	NECB-S-M12G4-C2-D	
		M12, 5-pin	For cable Ø 2.1 ... 7 mm	8162296	NECB-S-M12G5-C2	
For 2x cable Ø 2.1 ... 5.6 mm	8162297		NECB-S-M12G5-C2-D			
Distributors						
	Modular system for all types of sensor/actuator distributor			–	NEDY-... → Internet: nedy	
	T-plug connector	1x plug M8, 4-pin	2x socket M8, 3-pin	8005312	NEDY-L2R1-V1-M8G3-N-M8G4	
		1x plug M12, 4-pin	2x socket M8, 3-pin	8005311	NEDY-L2R1-V1-M8G3-N-M12G4	
			2x socket M12, 5-pin	8005310	NEDY-L2R1-V1-M12G5-N-M12G4	
Inscription label holders						
	Inscription label holders for EL modules, bag of 10			547473	ASCF-H-E2	
User documentation						
	User documentation for input/output modules			German	539299	P.BE.-CPEA-CL-DE
				English	539300	P.BE.-CPEA-CL-EN
				French	539302	P.BE.-CPEA-CL-FR
				Italian	539303	P.BE.-CPEA-CL-IT
				Spanish	539301	P.BE.-CPEA-CL-ES

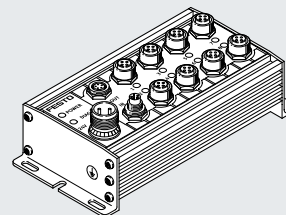
Datasheet – Output modules CP-A08

Function

The electrical outputs control actuators such as individual valves, lamps, signal equipment and much more.

Application area

- Output module with 8 outputs 24 V DC
- M12 connection technology, 5-pin socket
- LED indicator for the switching status per channel
- Short circuit and overload detection
- Malfunction display by a green LED



Note

Optimum actuation of valves with M12 central plug.

General technical data

Type	CP-A08-M12-5POL Positive switching	
Number of outputs	8	
Assignment of outputs	Single assignment	
Output connection type	8x M12, 5-pin	
Load voltage connection	M18, 4-pin	
Bus connection	2 plugs M9, 5-pin, via prefabricated cables	
Max. output current per channel	[A]	0.5
Operating voltage	[V DC]	24 ±25%
Load voltage connection	[V DC]	24 ±25%, reverse polarity protected
Fuse protection for power output	[A]	Electronic fuse per output 0.5
Intrinsic current consumption of electronics	[mA]	Max. 90
Overload/short-circuit protection	Per channel	
Switching logic	PNP to IEC 1131-2	
Degree of protection to EN 60529	IP65 (when fully plugged in or fitted with protective cover)	
Temperature range	Operating	[°C] -5 ... +50
	Storage	[°C] -20 ... +70
Material	Die-cast aluminium	
LABS (PWIS) conformity	VDMA24364-B2-L	
Dimensions (LxWxD)	[mm]	172.9 x 78 x 57.1
Weight	[g]	500

Certifications

ATEX category for gas	II 3G
Type of (ignition) protection for gas	Ex ec IIC T5 Gc X
ATEX category for dust	II 3D
Type of (ignition) protection for dust	Ex tc IIIC T80°C IP65 Dc X
ATEX ambient temperature	[°C] -5 ≤ Ta ≤ +50
Explosion protection certification outside the EU	EPL Dc (GB)
	EPL Gc (GB)
CE marking (see declaration of conformity)	To EU EMC Directive ¹⁾
	To EU Explosion Protection Directive (ATEX)
	To EU RoHS Directive
UKCA marking (see declaration of conformity)	To UK EMC regulations
	To UK explosion regulations
	To UK RoHS regulations
KC marking	KC EMC
Certification	c UL us - Recognized (OL)

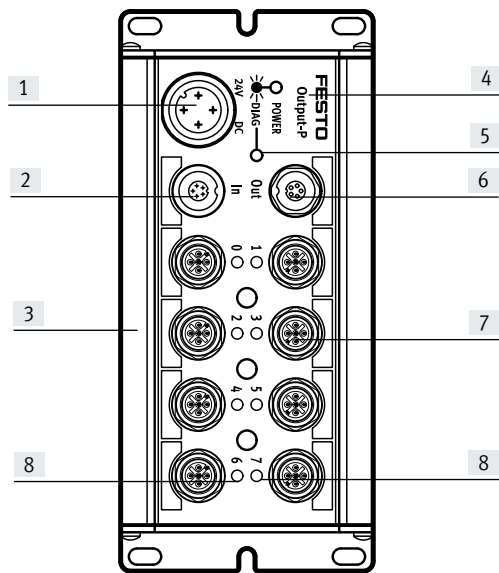
1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Datasheet – Output modules CP-A08

Connection and display components

CP-A08-M12...



- [1] Load voltage connection
- [2] CP connection, incoming
- [3] Slot for identification labels (IBS-6x10)
- [4] Identification for output type:
 - OUTPUT-P for PNP outputs
 - OUTPUT-N for NPN outputs
- [5] Status LED (green)
- [6] CP connection, outgoing
- [7] Connections for actuators
- [8] Yellow LED for status indication (one LED per input)

Pin assignment – Load voltage connection CP-A08-M12...

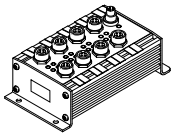
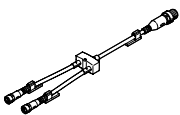
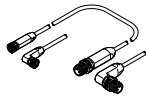
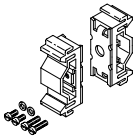
Terminal assignment	Pin	Signal	Designation
	1	n.c.	Not connected
	2	24 V DC ±25%	Operating voltage
	3	0 V	Operating voltage 0 V
	4	FE	Protective earth

Pin assignment – Outputs

Terminal assignment	Pin	Signal	Designation	Pin	Signal
CP-A08-M12-5POL (PNP outputs)					
	1	n.c.	Not connected	1	n.c.
	2	Ox+1	Connected with pin 4 of plug 2/not connected	2	n.c.
	3	0 V	Reference potential	3	0 V
	4	Ax	Output/connected with pin 2 of plug 1	4	Ox+1
	5	Ground	Earth terminal	5	Ground
 Note Two outputs can be connected to connections 0, 2, 4 and 6 of the CP output module via an internal connection between pin 2 of the even numbered output and pin 4 of the opposite odd numbered output.					

* Ox = Output x

Accessories – Output modules CP-A08

Ordering data				Part no.	Type
Designation					
Output modules					
	Positive switching			175640	CP-A08-M12-5POL
Power supply					
	Power supply socket, straight, M18x1, 4-pin		For 1.5 mm²	18493	NTSD-GD-9
			For 2.5 mm²	18526	NTSD-GD-13,5
	Power supply socket, angled, M18x1, 4-pin		For 1.5 mm²	18527	NTSD-WD-9
			For 2.5 mm²	533119	NTSD-WD-11
Sensor plug					
	Straight plug	M12, 4-pin	For 2x cable Ø 2.1 ... 5.6 mm	8162295	NECB-S-M12G4-C2-D
		M12, 5-pin	For cable Ø 2.1 ... 7 mm	8162296	NECB-S-M12G5-C2
				For 2x cable Ø 2.1 ... 5.6 mm	8162297
Distributors					
	Modular system for all types of sensor/actuator distributor			–	NEDY-... → Internet: nedy
Connecting cable					
	Modular system for a choice of connecting cables			–	NEBA-... → Internet: neba
Mounting					
	Mounting, for DIN rail			170169	CP-TS-HS35

Datasheet – Output modules CP-A08-EL

Function

The electrical outputs control actuators such as individual valves, lamps, signal equipment and much more.

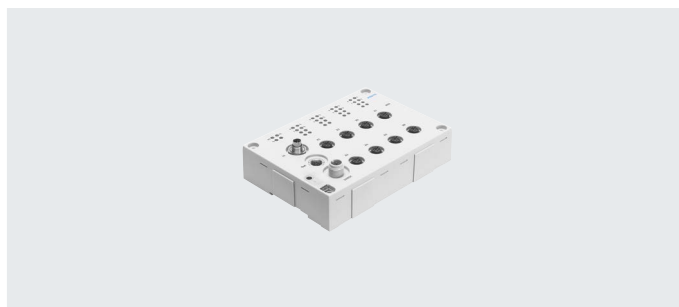


Note

The output module is ideal for actuation of valves with M12 central plug.

Application area

- Output module with 8 outputs 24 V DC
- M12, 5-pin connection technology
- Indication of the switching status per channel via LED
- Short-circuit and overload detection
- Error indication by a red LED
- Module supports the CPI functionality (only in combination with the CPX CP interface)
- Labelling options on all sides with large, hinged inscription label
- Earthing plate and DIN rail mounting already integrated



General technical data		
Type		CP-A08-M12-EL-Z Positive switching
Number of outputs		8
Assignment of outputs		Connection 1, 3, 5 and 7 with double assignment, connection 2, 4, 6 and 8 with single assignment
Sensor connection type		8x M12, 5-pin
Power supply 24 V DC		M12, 4-pin, A-coded
Intrinsic current consumption at operating voltage	[mA]	Typically 35
Max. total current per module	[A]	4
Max. output current per channel	[A]	Max. 0.5, max. 2 outputs can be connected in parallel
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	18 ... 30
Residual ripple load voltage	[Vss]	4
Note on the load voltage		Via load voltage connection (24 V DC)
Fuse protection (short circuit)		Internal electronic fuse protection for each group
Switching logic		PNP
Output characteristic curve		To ICE 1131-T2
Galvanic isolation between channels		None
Connection to the bus node		Via pre-assembled cables
Diagnostics		CP communication
		Short circuit/overload per channel
		Undervoltage
LED indicators		3 Module diagnostics
		8 Channel status
		8 Channel diagnostics

Materials	
Housing	Reinforced PA
Cover	Reinforced PA
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364-B2-L

Datasheet – Output modules CP-A08-EL

Operating and environmental conditions		
Degree of protection to EN 60529		IP65/IP67 (when fully plugged in or fitted with protective cover)
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70
Corrosion resistance class CRC ¹⁾		1
CE marking (see declaration of conformity)		To EU EMC Directive ²⁾
		To EU RoHS Directive ²⁾
UKCA marking (see declaration of conformity)		To UK EMC regulations ²⁾
		To UK RoHS regulations ²⁾
KC marking		KC EMC
Certification		RCM
		c UL us - Listed (OL)

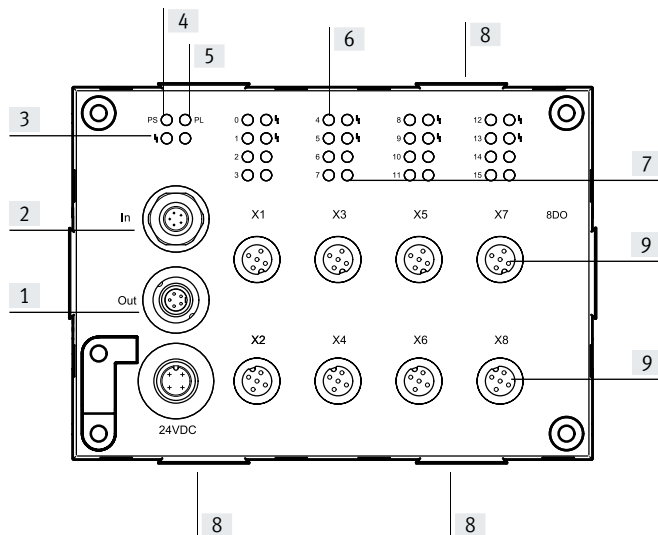
1) More information www.festo.com/x/topic/crc

2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Connection and display components

CP-A08-M12-EL-Z



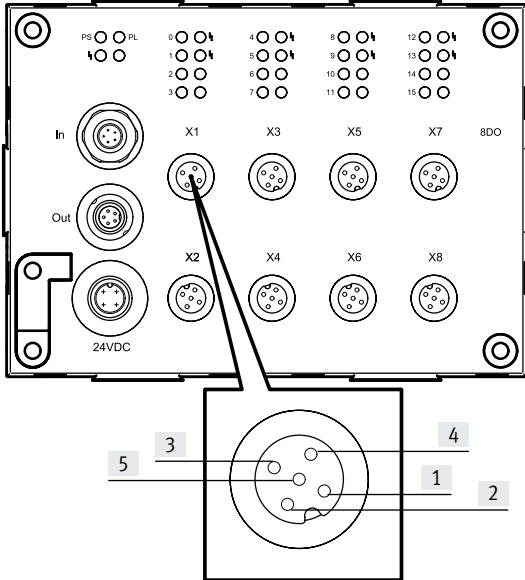
- [1] CP connection, outgoing
- [2] CP connection, incoming
- [3] Status LED (module) for short circuit/overload of sensor supply (red)
- [4] Status LED for CP communication (green)
- [5] Status LED for load supply (PL, green)
- [6] Status LEDs for outputs (status indication, yellow)
- [7] Status LED for output (channel) short circuit/overload (red)
- [8] Holder for inscription label holder ASCF-H-E2
- [9] 8 outputs (1 output per socket)

Pin assignment – Load voltage connection CP-A08-M12-EL-Z

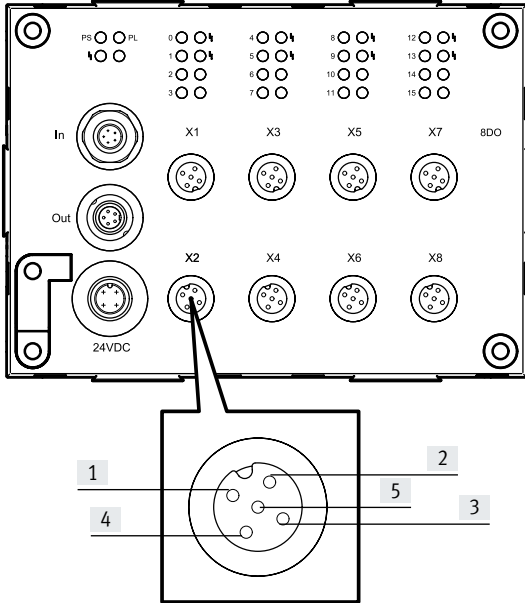
Terminal assignment

Pin	Signal	Designation
1	n.c.	Not connected
2	24 V DC ±25%	Operating voltage
3	0 V	Operating voltage 0 V
4	FE	Protective earth

Datasheet – Output modules CP-A08-EL

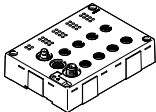
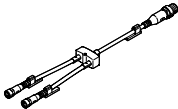
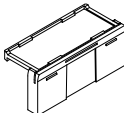
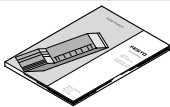
Pin assignment – Outputs		Output 1, 3, 5 and 7		Designation
Terminal assignment		Pin	Signal	
CP-A08-M12-EL-Z (odd number of PNP outputs)				
	1	n.c.	Not connected	-  - Note Two outputs can be connected to each of connections 1, 3, 5 and 7 of the CP output module via an internal connection between pin 2 of the odd numbered output and pin 4 of the underlying even numbered output.
	2	Ox+1	Connected with pin 4 of output 2	
	3	0 V	Reference potential	
	4	Ax	Output	
	5	FE	Earth terminal	

* Ox = Output x

Pin assignment – Outputs		Output 2, 4, 6 and 8		Designation
Terminal assignment		Pin	Signal	
CP-A08-M12-EL-Z (even number of PNP outputs)				
	1	n.c.	Not connected	
	2	n.c.	Not connected	
	3	0 V	Reference potential	
	4	Ox+1	Connected with pin 2 of output 1	
	5	FE	Earth terminal	

* Ox = Output x

Accessories – Output modules CP-A08-EL

Ordering data					
Designation				Part no.	Type
Output module					
	Positive switching			546924	CP-A08-M12-EL-Z
Plug					
	Straight plug	M12, 4-pin	For cable Ø 2.1 ... 7 mm	8162294	NECB-S-M12G4-C2
			For 2x cable Ø 2.1 ... 5.6 mm	8162295	NECB-S-M12G4-C2-D
	M12, 5-pin	For cable Ø 2.1 ... 7 mm	8162296	NECB-S-M12G5-C2	
		For 2x cable Ø 2.1 ... 5.6 mm	8162297	NECB-S-M12G5-C2-D	
Distributors					
	Modular system for all types of sensor/actuator distributor			–	NEDY-... → Internet: nedy
Inscription label holders					
	Inscription label holders for EL modules, bag of 10			547473	ASCF-H-E2
User documentation					
	User documentation for input/output modules		German	539299	P.BE.-CPEA-CL-DE
			English	539300	P.BE.-CPEA-CL-EN
			French	539302	P.BE.-CPEA-CL-FR
			Italian	539303	P.BE.-CPEA-CL-IT
			Spanish	539301	P.BE.-CPEA-CL-ES

Datasheet – Valve terminals MPA-S

-  Flow rate
 - MPA1: up to 360 l/min
 - MPA14: up to 550 l/min
 - MPA2: up to 700 l/min
-  Valve width
 - MPA1: 10 mm
 - MPA14: 14 mm
 - MPA2: 21 mm
-  Voltage
 - 24 V DC
-  Repair service

CPI interface for communication between a valve terminal MPA-S and a CPI master. It activates a valve terminal MPA-S with up to 32 solenoid coils on max. 16 valve positions. It is also possible to install an additional electrical supply at any other point on the valve terminal to create different voltage zones.



-  **Note**

An additional electrical supply is essential for more than 16 MPA2 solenoid coils (more than 4 electronics modules). Please note that without an additional electrical supply a maximum of 24 solenoid coils can be connected at the same time. If more than 24 MPA1, 24 MPA14 or 12 MPA2 solenoid coils are to be connected at the same time, an additional supply must be connected at least after the third electronics module.

General technical data				MPA-CPI-VI
Type				
CP interface, incoming				Plug M9, 5-pin
CP interface, outgoing				Socket M9, 5-pin
Max. no. of valve positions				32
Max. no. of pressure zones				9
LED display (product-specific)	PS			Common message regarding power supply
	PL			Power supply for valves
	Symbol			Module error
Nominal operating voltage			[V DC]	24
Permissible voltage fluctuations			[%]	±25%
Power failure buffering		Logic side only	[ms]	10
Current consumption at nominal operating voltage	Load		[mA]	Dependent on valve type and number of valves
	Electronics		[mA]	Approx. 50 (plus current consumption of electronics modules)
Residual ripple			[Vss]	4
Materials				Die-cast aluminium, PA
Note on materials				RoHS-compliant
LABS (PWIS) conformity				VDMA24364-B1/B2-L
Dimensions				→ Internet: mpa-s
Weight			[g]	220
Technical data – Valves				→ Internet: mpa-s
Degree of protection				IP67

Datasheet – Valve terminals MPA-S

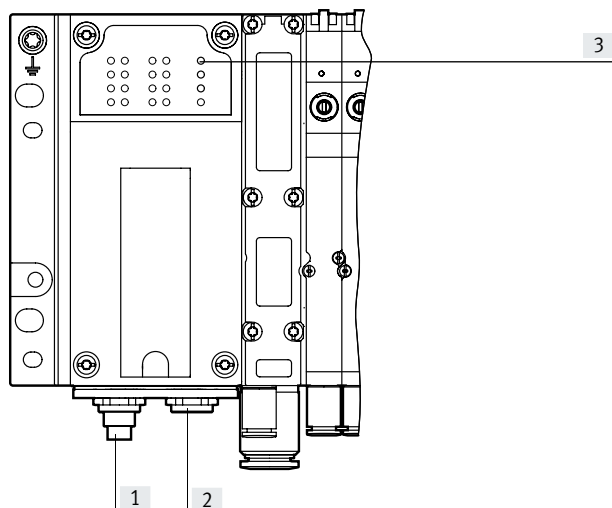
Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure	[MPa]	–0.09 ... +1
	[bar]	–0.9 ... +10
Pilot pressure	[MPa]	0.3 ... 0.8
	[bar]	3 ... 8
Ambient temperature	[°C]	–5 ... +50
Temperature of medium	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +40
Relative humidity		Max. 90% at 40 °C
CE marking (see declaration of conformity)		To EU EMC Directive ¹⁾
		To EU RoHS Directive
		To EU Explosion Protection Directive (ATEX)
UKCA marking (see declaration of conformity)		To UK EMC regulations
		To UK RoHS regulations
		To UK explosion regulations
KC marking		KC EMC
Certification		c UL us - Recognized (OL)
		RCM

1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.

If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

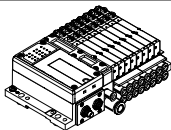
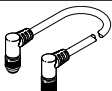
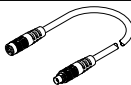
ATEX	
ATEX category for gas	II 3G
Type of (ignition) protection for gas	Ex ec IIC T4 Gc X
Explosion-proof ambient temperature	[°C] –5 ≤ Ta ≤ +50
Explosion protection certification outside the EU	EPL Db (GB)
	EPL Gb (GB)

Connection and display components



- [1] CP connection, incoming
- [2] CP connection, outgoing
- [3] Status LEDs
 - CP system supply (green)
 - Load supply (green)
 - Module error (red)

Datasheet – Valve terminals MPA-S

Ordering data		Part no.	Type	
Valve terminal MPA-S				
	With CPI interface	546280	MPA-CPI-VI	
Valve terminal connection				
	Connecting cable WS-WD	0.25 m	540327	KVI-CP-3-WS-WD-0.25
		0.5 m	540328	KVI-CP-3-WS-WD-0.5
		2 m	540329	KVI-CP-3-WS-WD-2
		5 m	540330	KVI-CP-3-WS-WD-5
		8 m	540331	KVI-CP-3-WS-WD-8
	Connecting cable GS-GD	2 m	540332	KVI-CP-3-GS-GD-2
		5 m	540333	KVI-CP-3-GS-GD-5
		8 m	540334	KVI-CP-3-GS-GD-8

Datasheet – CPV-SC valve terminals

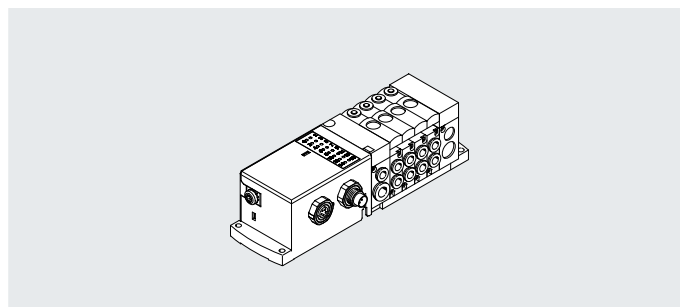
-  - Flow rate
170 l/min

-  - Valve width
10 mm

-  - Voltage
24 V DC

-  - Repair service

CPI interface for communication between a CPV-SC valve terminal and a CPI master. It activates a valve terminal CPV-SC with up to 16 solenoid coils.



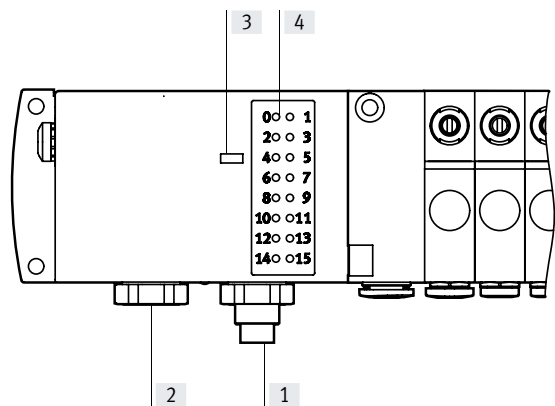
General technical data			CPVSC1-AE16-CPI
Type			
Types of communication			CP fieldbus
Protocol			CP fieldbus
Fieldbus interface			M9, 5-pin, plug and socket
Max. no. of solenoid coils			16
LED display (bus-specific)			CP: CP fieldbus
Device-specific diagnostics			Undervoltage of valve terminal
Parameterisation			Parameterisation via CP protocol
Reverse polarity protection			For all electrical operating voltage connections
Current consumption at nominal operating voltage	Electronics	[mA]	≤100
	Load		Dependent on valve type and number of valves
Protection against direct and indirect contact			PELV
Housing material			Reinforced PA
Note on materials			RoHS-compliant
LABS (PWIS) conformity			VDMA24364-B2-L
Type of mounting			Via through-hole
Width		[mm]	52
Height		[mm]	40
Length		[mm]	70
Product weight		[g]	150
Technical data – Valves			→ Internet: cpv-sc
Degree of protection			IP20
			To IEC 60529

Datasheet – CPV-SC valve terminals

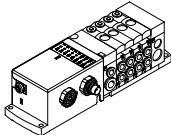
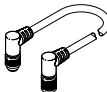
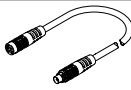
Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +50
Relative humidity	90% at 50 °C	
	Non-condensing	
Corrosion resistance class CRC ¹⁾	1	
CE marking (see declaration of conformity)	To EU EMC Directive ²⁾	
Certification	c UL us - Recognized (OL)	

- 1) More information www.festo.com/x/topic/crc
- 2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

Connection and display components



- [1] CP connection, incoming
- [2] CP connection, outgoing
- [3] Status LED for CP communication
- [4] Valve status LEDs

Ordering data				
Designation			Part no.	Type
Valve terminal CPV-SC				
	With CPI interface		541975	CPVSC1-AE16-CPI
Valve terminal connection				
	Connecting cable WS-WD	0.25 m	540327	KVI-CP-3-WS-WD-0.25
		0.5 m	540328	KVI-CP-3-WS-WD-0.5
		2 m	540329	KVI-CP-3-WS-WD-2
		5 m	540330	KVI-CP-3-WS-WD-5
		8 m	540331	KVI-CP-3-WS-WD-8
	Connecting cable GS-GD	2 m	540332	KVI-CP-3-GS-GD-2
		5 m	540333	KVI-CP-3-GS-GD-5
		8 m	540334	KVI-CP-3-GS-GD-8

Datasheet – Bus node CTEU

-  - Flow rate
Dependent on the connected
valve terminal

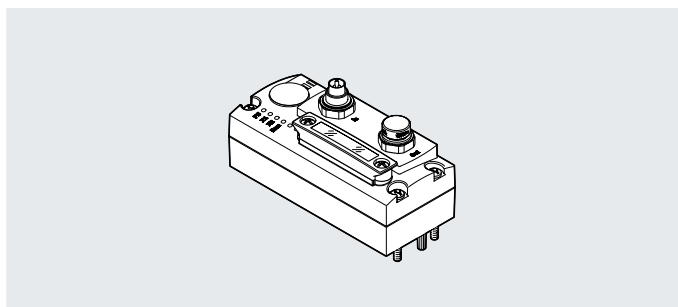
-  - Valve width
Dependent on the connected
valve terminal

-  - Voltage
24 V DC

CPI interface for communication
between a valve terminal or input
modules with I-Port interface and
a CPI master.

Valve terminals with I-Port interface

- CPV
- MPA-L
- VTUG



General technical data				CPI-CP
Type				
Protocol				CPI-B
Diagnostics				Communication error
				System diagnostics
				Undervoltage
Parameterisation				Diagnostic behaviour
				Fail-safe response
Configuration support				None
Control elements				DIL switches
LED indicator	Product-specific			PS: Operating voltage for electronics and load supply
				X1: System status of module at I-Port 1
				X2: System status of module at I-Port 2
Maximum address capacity	Bus-specific			RUN: Communication OK
	Inputs	[byte]		4
	Outputs	[byte]		4
Type of mounting				On electrical interface
				On electrical connection block
Degree of protection				IP65
				IP67
Note on degree of protection				In mounted state
				Unused connections sealed
Dimensions W x L x H		[mm]		40 x 91 x 50
Grid dimension		[mm]		40
Product weight		[g]		105

Technical data – Fieldbus interface

Fieldbus interface				
Protocol				CPI-B
Function				Incoming bus connection
				Power supply
Transmission rate		[kbps]		1000
Type				CP installation system
Connection type				Plug
Connection technology				M9x0.5
Number of pins/cores				5
Internal cycle time				2 ms per 2 byte of user data
Fieldbus interface 2				
Function				Bus connection outgoing
				Power supply
Connection type				Socket
Connection technology				M9x0.5
Number of pins/cores				5

Datasheet – Bus node CTEU

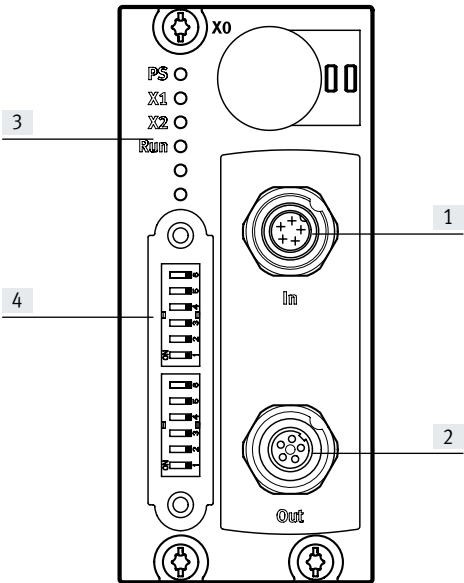
Technical data – Electrics		
Nominal operating voltage	[V DC]	24
Operating voltage range	[V DC]	18 ... 30
Intrinsic current consumption at nominal operating voltage	[mA]	Typically 50
Max. power supply	[A]	3.4
Power failure buffering	[ms]	10

Operating and environmental conditions		
Ambient temperature	[°C]	–5 ... +50
Storage temperature	[°C]	–20 ... +70
Corrosion resistance class CRC ¹⁾		2
CE marking (see declaration of conformity)		To EU EMC Directive ²⁾ To EU RoHS Directive
UKCA marking (see declaration of conformity)		To UK EMC regulations To UK RoHS regulations
KC marking		KC EMC
Certification		c UL us - Listed (OL) RCM

- 1) More information www.festo.com/x/topic/crc
- 2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/catalogue/... → Support/Downloads.
If the devices are subject to usage restrictions in residential, commercial or light-industrial environments, further measures for the reduction of the emitted interference may be necessary.

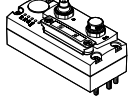
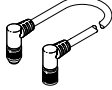
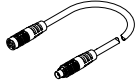
Materials	
Housing	PA
Note on materials	RoHS-compliant
LABS (PWIS) conformity	VDMA24364 zone III

Connection and display components



- [1] CP connection, incoming
- [2] CP connection, outgoing
- [3] Status LED for CP communication
- [4] DIL switches

Datasheet – Bus node CTEU

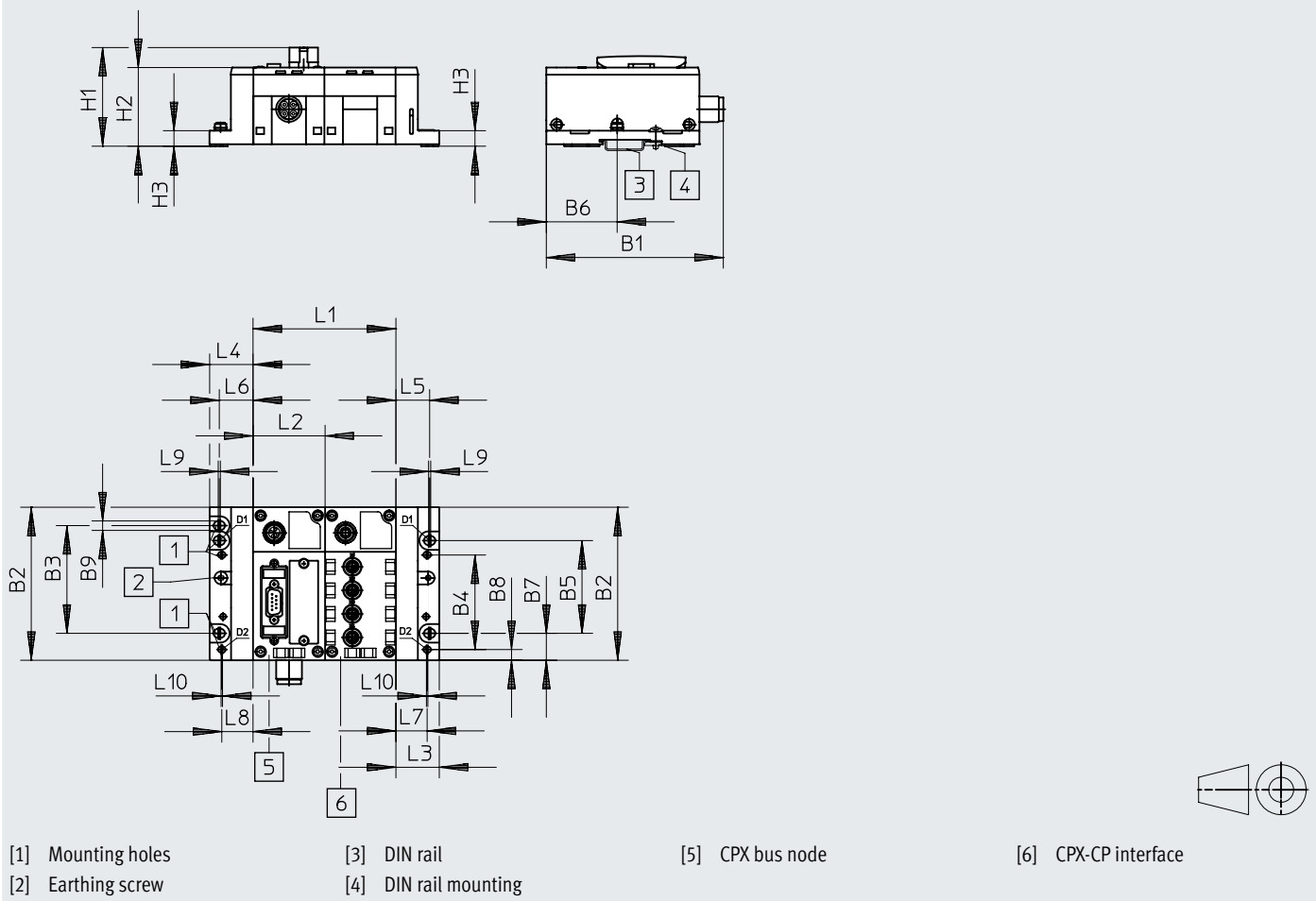
Ordering data				
Designation			Part no.	Type
Bus node				
	For valve terminals with I-Port interface		2149714	CTEU-CP
Valve terminal connection				
	Connecting cable WS-WD	0.25 m	540327	KVI-CP-3-WS-WD-0.25
		0.5 m	540328	KVI-CP-3-WS-WD-0.5
		2 m	540329	KVI-CP-3-WS-WD-2
		5 m	540330	KVI-CP-3-WS-WD-5
		8 m	540331	KVI-CP-3-WS-WD-8
	Connecting cable GS-GD	2 m	540332	KVI-CP-3-GS-GD-2
		5 m	540333	KVI-CP-3-GS-GD-5
		8 m	540334	KVI-CP-3-GS-GD-8

Technical data

Dimensions – Bus node

Download CAD data → www.festo.com

CPX-FB... and CPX-CP-4-FB

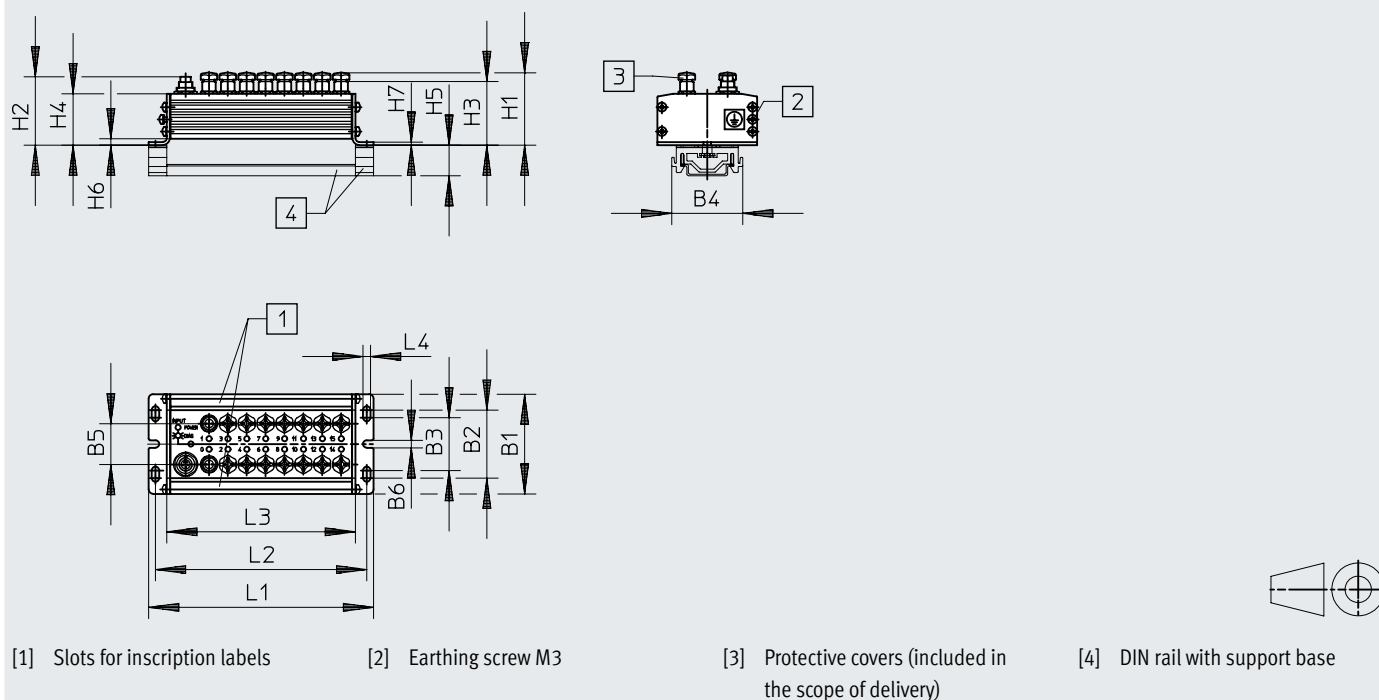


	B1	B2	B3	B4	B5	B6	B7	B8	B9	D1	D2	H1
CPX	124	107.3	77.95	66.3	65	49.65	18.85	7.5	6.6	M6	M4	69.1

	H2	H3	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
CPX	55.1	10.8	100.2	50.1	30.75	30.4	24	23.7	22.25	22	1.5	1

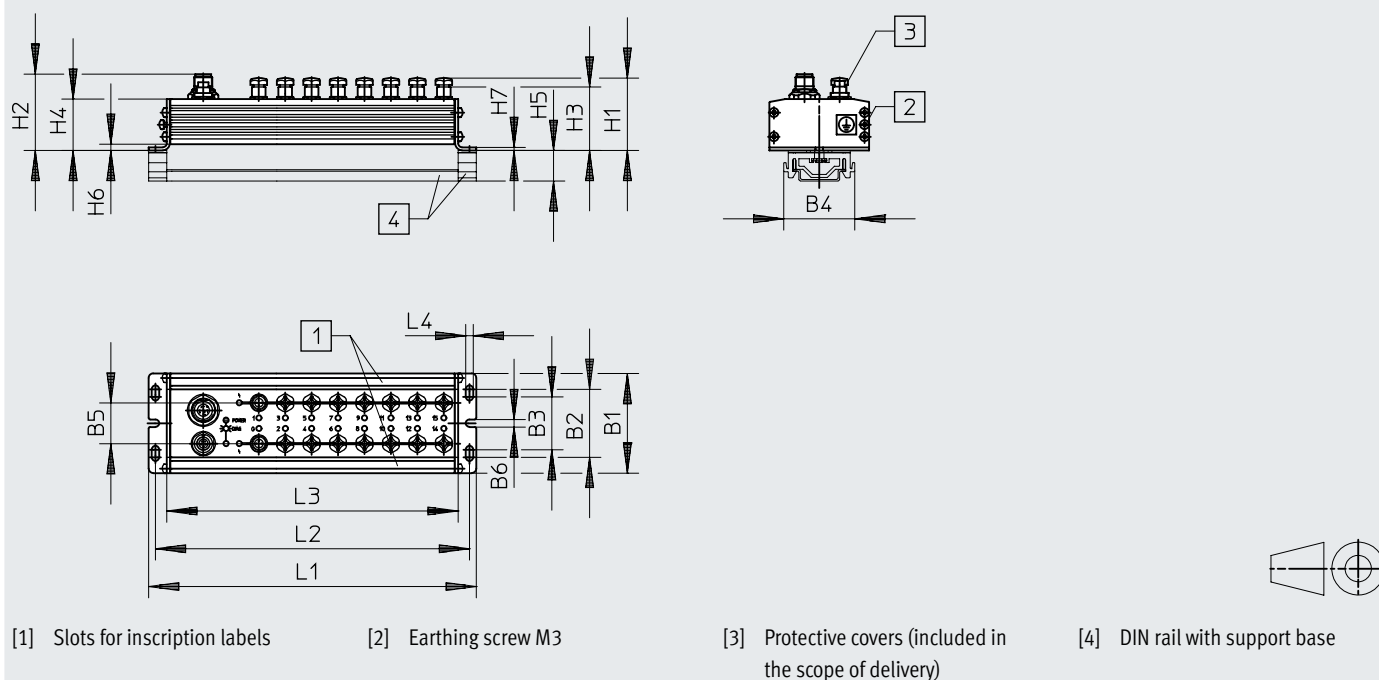
Technical data

Dimensions – CP-E16-M8

Download CAD data → www.festo.com

	B1	B2	B3	B4	B5	B6	H1	H2	H3	H4	H5	H6	H7	L1	L2 ±0.4	L3	L4
CP-E16-M8	66	45	35	47	27	5	47.9	45.2	42.1	34	18.1	4.2	2	148.9	139.9	124.9	5

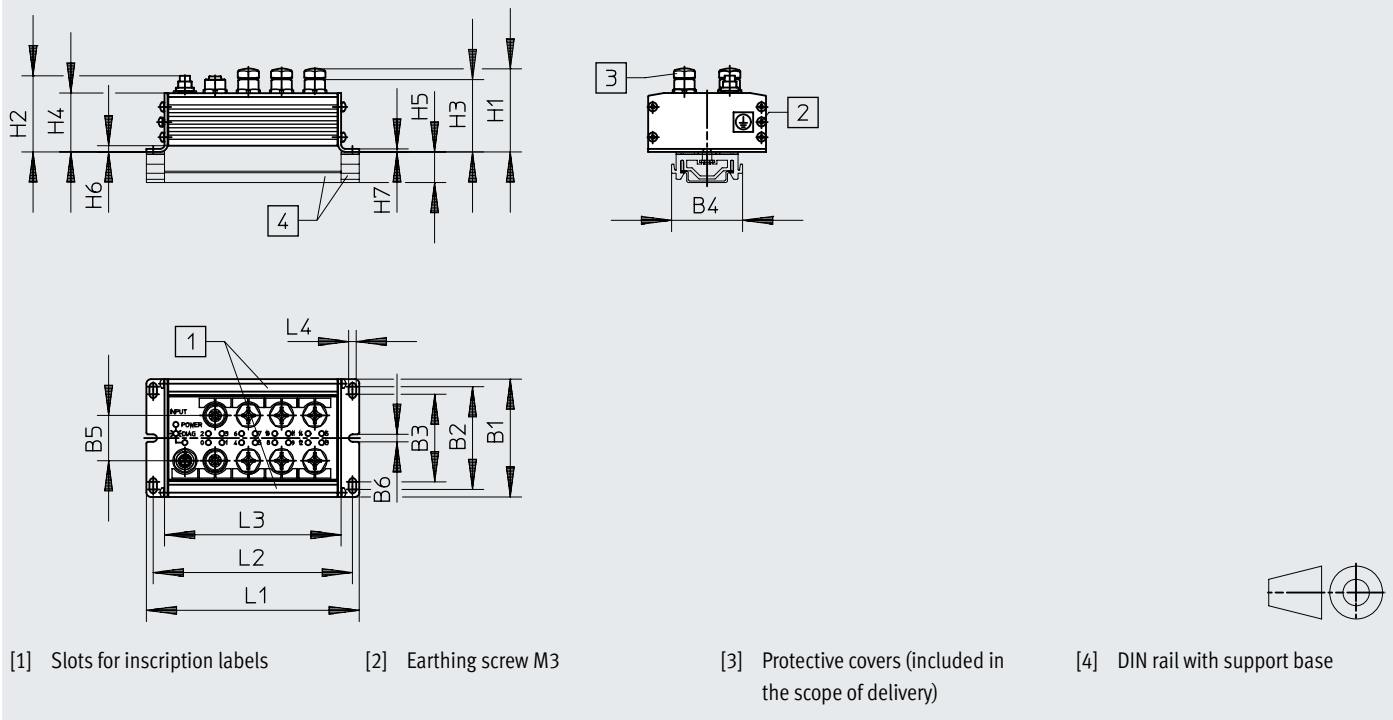
Dimensions – CP-E16-M8-Z

Download CAD data → www.festo.com

	B1	B2	B3	B4	B5	B6	H1	H2	H3	H4	H5	H6	H7	L1	L2 ±0.4	L3	L4
CP-E16-M8-Z	66	45	35	47	27	5	47.9	50.6	42.1	34	18.1	4.2	2	216.9	207.9	192.9	5

Technical data

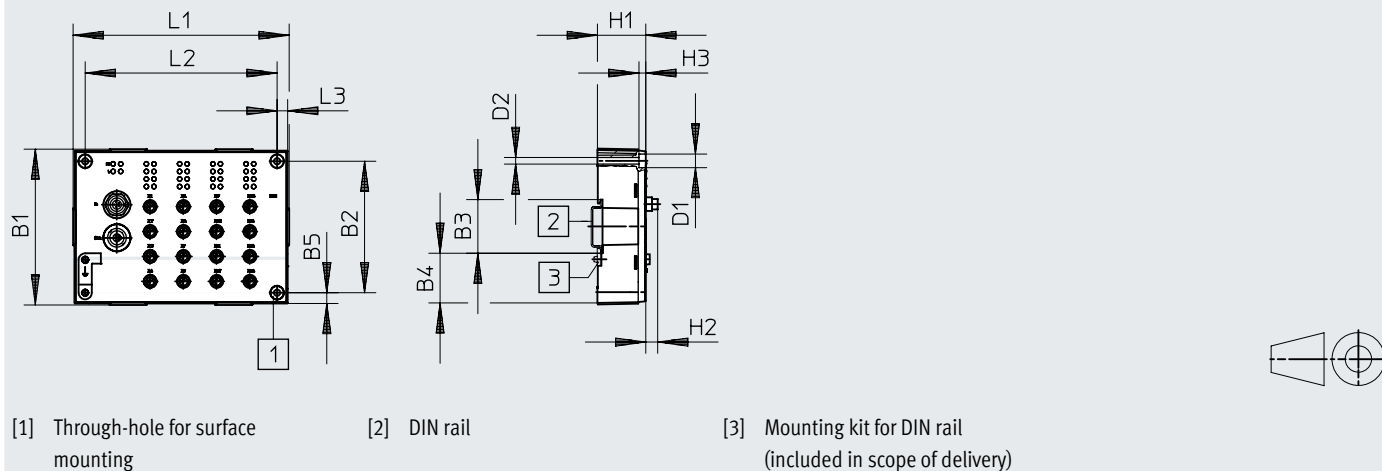
Dimensions – CP-E16-M12x2-5POL Download CAD data → www.festo.com



	B1	B2	B3	B4	B5	B6	H1	H2	H3	H4	H5	H6	H7	L1	L2 ±0.4	L3	L4
CP-E16-M12x2	78	68	58	47	30	5	55.2	50.5	48	39	18.1	4.2	2	140.9	131.9	116.9	5

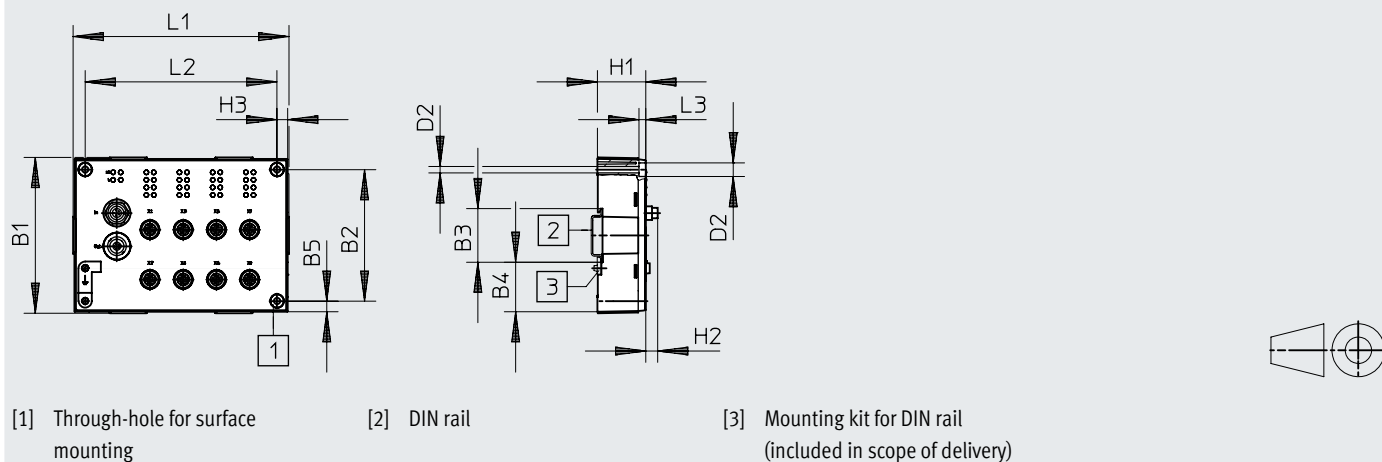
Technical data

Dimensions – CP-E16-M8-EL

Download CAD data → www.festo.com

	B1	B2	B3	B4	B5	D1 Ø	D2 Ø	H1	H2	H3	L1	L2	L3
CP-E16-M8-EL	103	87	35.5	32.8	7	9	4.3	32	7.9	3.5	143	127	7

Dimensions – CP-E16-M12-EL

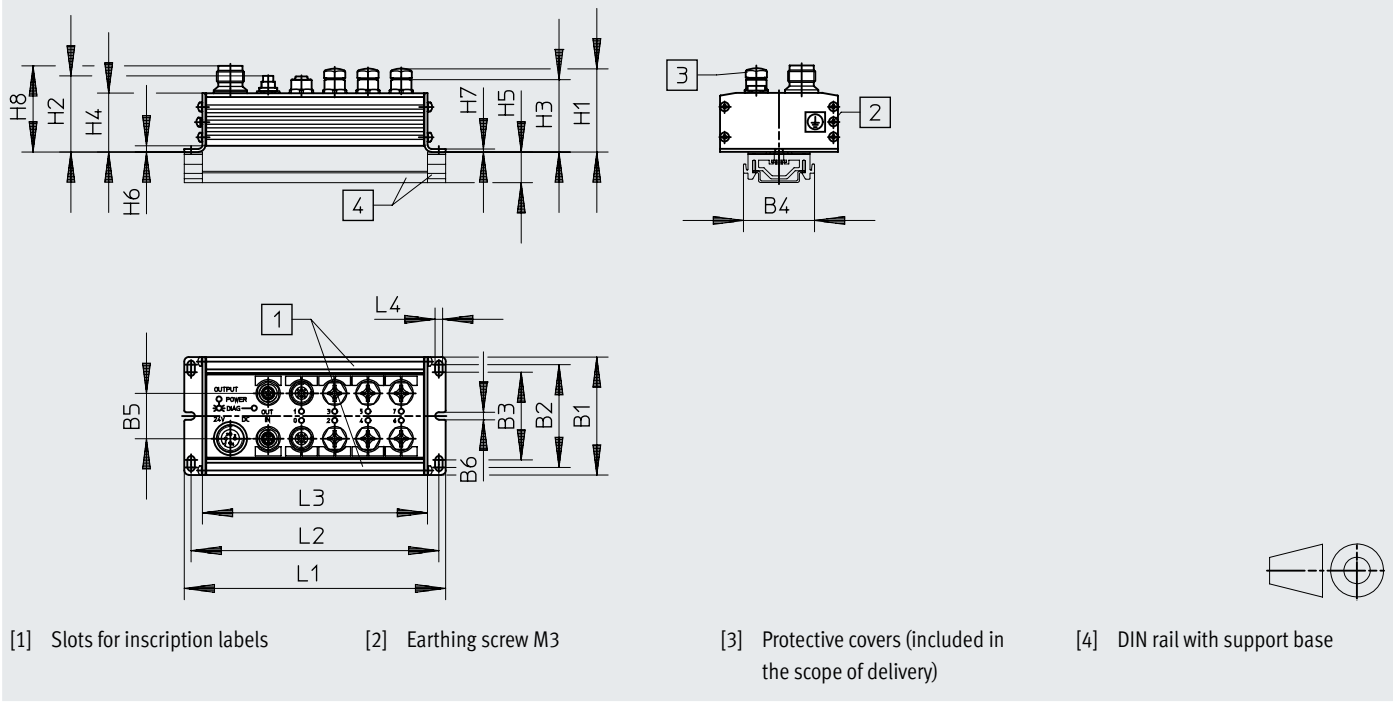
Download CAD data → www.festo.com

	B1	B2	B3	B4	B5	D1 Ø	D2 Ø	H1	H2	H3	L1	L2	L3
CP-E16-M12-EL	103	87	35.5	32.8	7	9	4.3	32	7.9	3.5	143	127	7

Technical data

Dimensions – CP-A08-M12-5POL

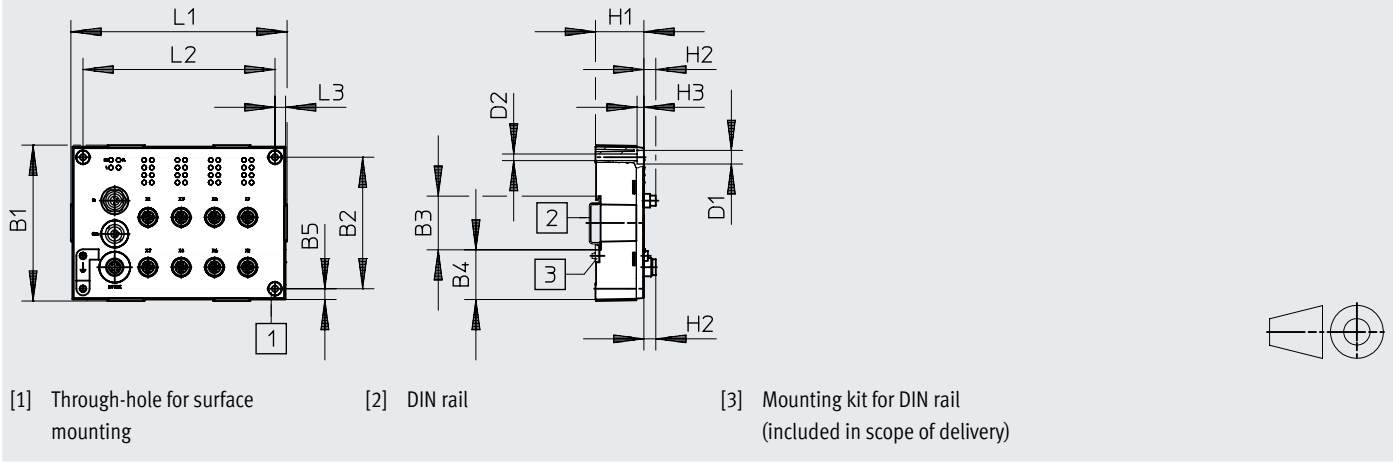
Download CAD data → www.festo.com



	B1	B2	B3	B4	B5	B6	H1	H2	H3	H4	H5	H6	H7	H8	L1	L2 ±0.4	L3	L4
CP-A08-M12	78	68	58	47	30	5	55.2	50.5	48	39	18.1	4.2	2	57.1	172.9	163.9	148.9	5

Dimensions – CP-A08-M12-EL-Z

Download CAD data → www.festo.com

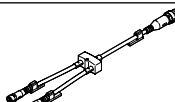
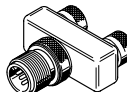
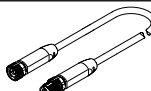
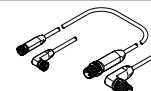
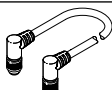
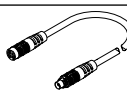


	B1	B2	B3	B4	B5	D1 Ø	D2 Ø	H1	H2	H3	L1	L2	L3
CP-A08-M12-EL-Z	103	87	35.5	32.8	7	9	4.3	32	7.9	3.5	143	127	7

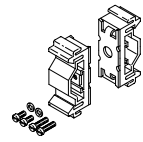
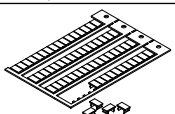
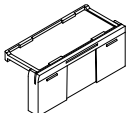
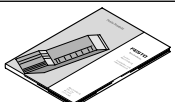
Order processing information

Configuration guidelines			
The CPI system supports a certain number of modules per CP string		depending on the type of the CP master and the CP modules connected.	CP masters and CP modules can be categorised into two different groups:
CP modules with CPI functionality			
CP modules with CPI functionality are characterised by the following features:			
• Incoming and outgoing CP interface • Any arrangement of modules within a CP string		• Max. 4 modules per CP string • Max. 32 inputs and 32 outputs can be connected to each string depending on the version	• With CPI functionality • Without CPI functionality.
			CP modules without CPI functionality
		Sturdy CP modules offer the following features:	
		• CP valve terminals and CP output modules have an incoming and an outgoing CP interface	• CP input modules only have an incoming CP interface and therefore can only be positioned at the end of a CP string • All CP modules with CPI functionality can also be connected to CP masters without extended functionality.
Notes on the use of CP modules with and without CPI functionality			
A mixture of CP modules with and without CPI functionality is possible. The following must be noted in this case:		• Only one input module without CPI functionality is possible per CP string (at the end of a CP string)	• Only one CP valve terminal or output module without CPI functionality is possible per CP string (any point in the CP string) • Free positions in the CP string can be filled by CP modules with CPI functionality (max. 4 modules).
 Note The cable length for any given string may not exceed 10 m. Connecting cables are available in lengths of 0.25 m, 0.5 m, 2 m, 5 m and 8 m → p. 56		No more than 32 inputs and 32 outputs (sum of all CP modules on a CP string) may be connected, regardless of the type of CP module (with or without CPI functionality).	

Accessories

Ordering data					Part no.	Type
Designation						
Sensor plug						
	Straight plug	M8, 3-pin	Screw terminal	8162298	NECB-S-M8G3-C2	
		M12, 4-pin	For cable Ø 2.1 ... 7 mm	8162294	NECB-S-M12G4-C2	
			For 2x cable Ø 2.1 ... 5.6 mm	8162295	NECB-S-M12G4-C2-D	
		M12, 5-pin	For cable Ø 2.1 ... 7 mm	8162296	NECB-S-M12G5-C2	
		For 2x cable Ø 2.1 ... 5.6 mm	8162297	NECB-S-M12G5-C2-D		
Distributors						
	Modular system for all types of sensor/actuator distributor			–	NEDY-... → Internet: nedy	
	T-plug connector	1x plug M8, 4-pin	2x socket M8, 3-pin	8005312	NEDY-L2R1-V1-M8G3-N-M8G4	
		1x plug M12, 4-pin	2x socket M8, 3-pin	8005311	NEDY-L2R1-V1-M8G3-N-M12G4	
			2x socket M12, 5-pin	8005310	NEDY-L2R1-V1-M12G5-N-M12G4	
Connecting cable						
	1x socket M8, 3-pin	1x plug M8, 3-pin	0.5 m	★ 8078282	NEBA-M8G3-U-0.5-N-M8G3	
			1.0 m	★ 8078283	NEBA-M8G3-U-1-N-M8G3	
			2.5 m	★ 8078286	NEBA-M8G3-U-2.5-N-M8G3	
			5.0 m	★ 8078287	NEBA-M8G3-U-5-N-M8G3	
	Connecting cable M12-M12	5-pin	Straight plug / straight socket	1.5 m	529044	KV-M12-M12-1.5
3.5 m				530901	KV-M12-M12-3.5	
	Modular system for a choice of connecting cables			–	NEBA-... → Internet: neba	
Connecting cable – CP modules						
	Angled plug / angled socket		0.25 m	540327	KVI-CP-3-WS-WD-0.25	
			0.5 m	540328	KVI-CP-3-WS-WD-0.5	
			2 m	540329	KVI-CP-3-WS-WD-2	
			5 m	540330	KVI-CP-3-WS-WD-5	
			8 m	540331	KVI-CP-3-WS-WD-8	
	Straight plug / straight socket		2 m	540332	KVI-CP-3-GS-GD-2	
			5 m	540333	KVI-CP-3-GS-GD-5	
			8 m	540334	KVI-CP-3-GS-GD-8	
	Connecting plug for CP cable (cabinet through-feed)			543252	KVI-CP-3-SSD	

Accessories

Ordering data			Part no.	Type
Designation				
Protective covers				
	Cover cap for closing off unused connections (10 pieces)	For M8 connections	177672	ISK-M8
		For M12 connections	165592	ISK-M12
Mounting components				
	Mounting for DIN rail, CP modules		170169	CP-TS-HS35
Inscription labels				
	Inscription labels 6x10 mm, in frame (64 pieces)		18576	IBS-6x10
	Inscription label holders for EL modules, bag of 10		547473	ASCF-H-E2
Documentation				
	User documentation for CPX CP interface	German	539293	P.BE-CPX-CP-EN
		English	539294	P.BE-CPX-CP-EN
		Spanish	539295	P.BE-CPX-CP-ES
		French	539296	P.BE-CPX-CP-FR
		Italian	539297	P.BE-CPX-CP-IT
	User documentation for compact input/output modules	German	539299	P.BE.-CPEA-CL-DE
		English	539300	P.BE.-CPEA-CL-EN
		French	539302	P.BE.-CPEA-CL-FR
		Italian	539303	P.BE.-CPEA-CL-IT
		Spanish	539301	P.BE.-CPEA-CL-ES
	System description	German	165126	P.BE-CPSYS-DE
		English	165226	P.BE-CPSYS-EN
		French	165128	P.BE-CPSYS-FR
		Italian	165158	P.BE-CPSYS-IT
		Spanish	165228	P.BE-CPSYS-ES