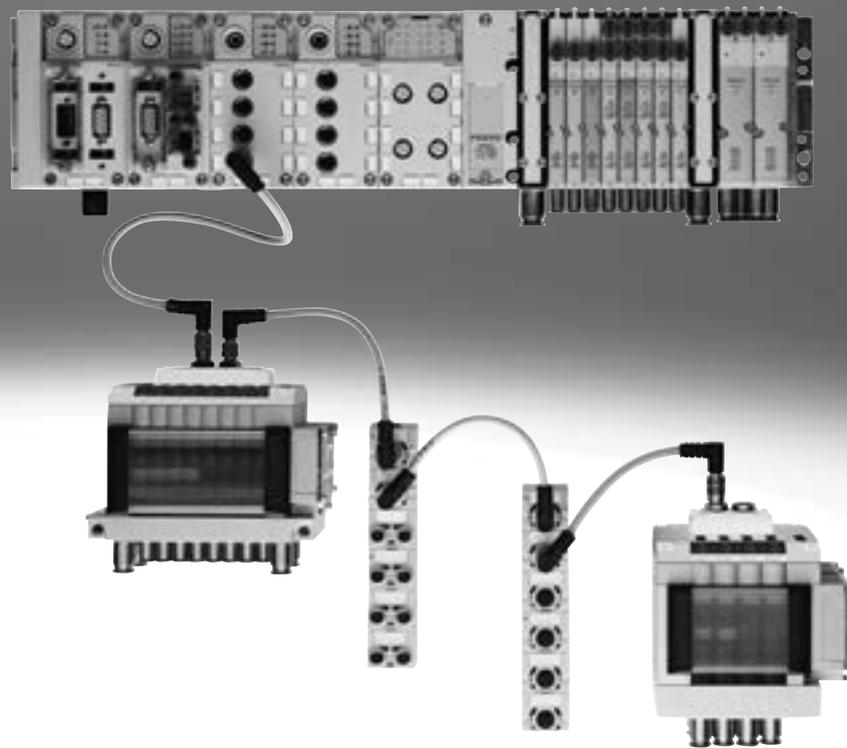
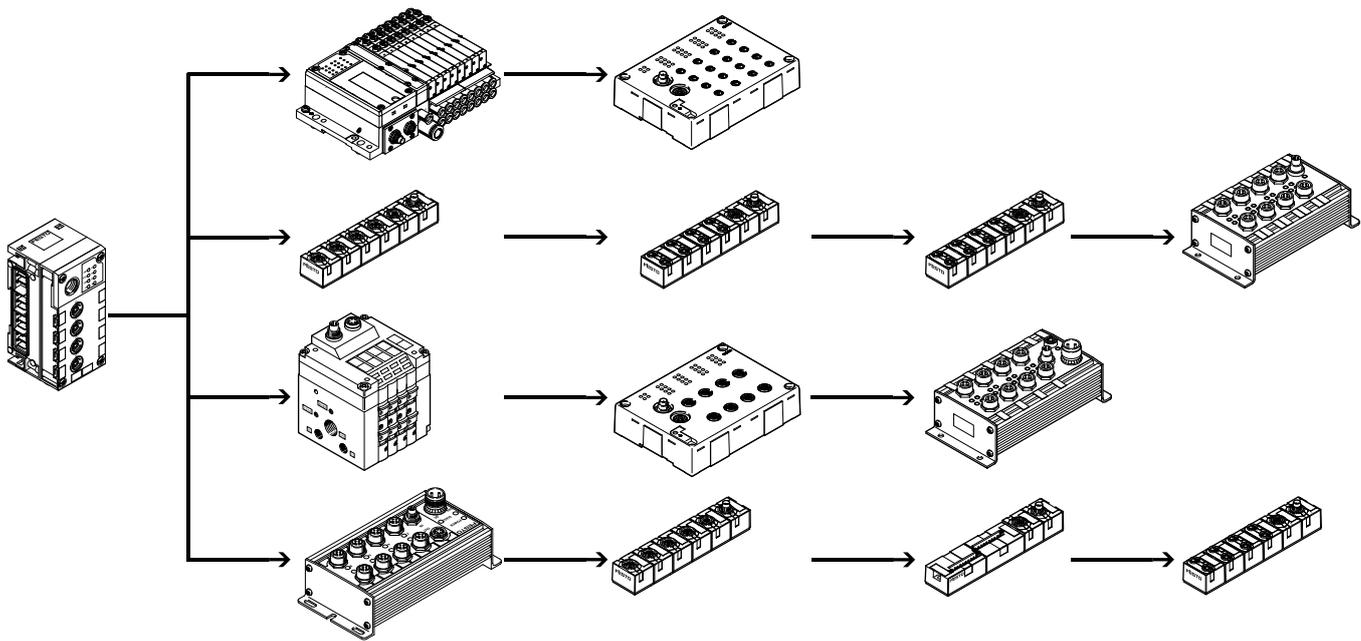


Installation system CPI

FESTO



Key features



Key features

Innovative

- Complete concept for decentralised machine and system structure; centralised and decentralised installation is possible in combination with the CPX terminal
- Decentralised pneumatic components and sensors for fast processes
- Centralised electric 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

Heavy-duty

- 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 plastic housing
- Sturdy connection technology M12, alternatively M8
- IP20 modules for control cabinet installation with a choice of spring-loaded terminals or screw terminals

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 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)
- Polarity-safe and short circuit-proof connections
- Valves with separate load voltage supply
- All modules equipped with local diagnostics and status LEDs
- Diagnostics of each CP string via controller/fieldbus
- Self-learning system (save button) for current configuration
- Easy replacement of modules at any time

Key features

Installation system CPI

The CPI system is capable of meeting the completely contrasting requirements created by the difference 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 meet 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.

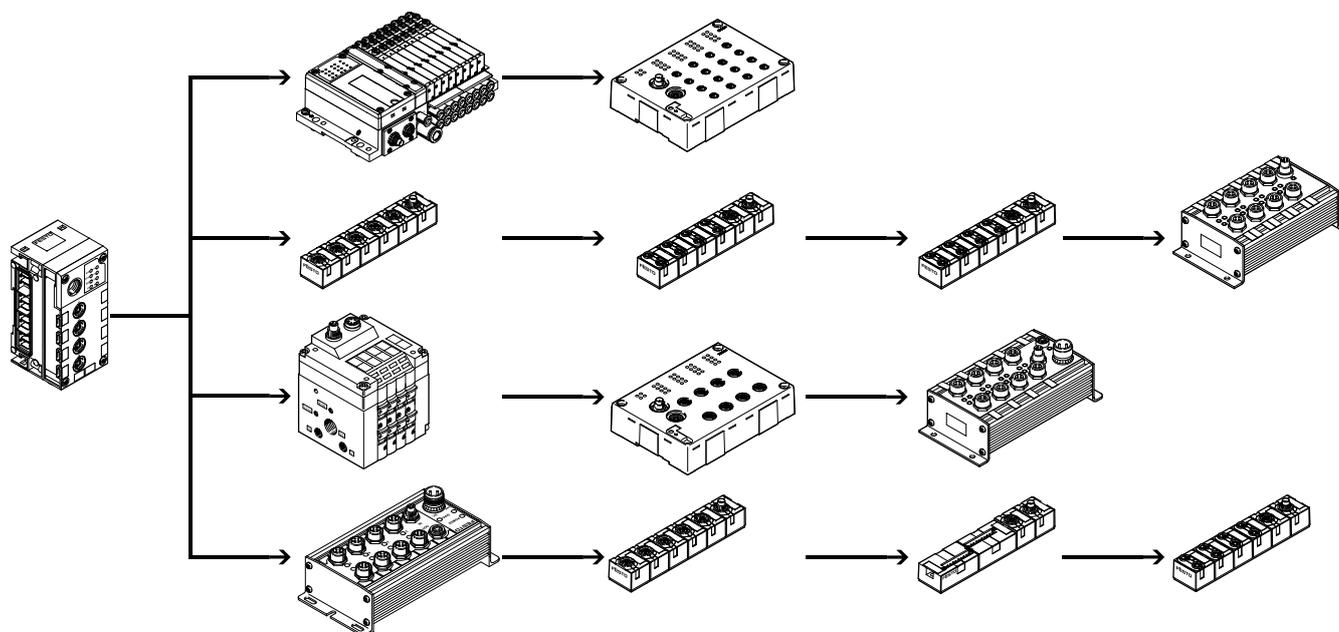
Scope of services:

- Max. 4 installation strings per CP interface
- Max. 10 metre line 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 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.

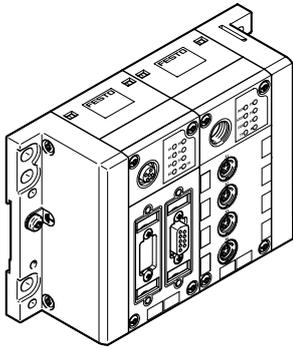
The CP interface is the central connection point for the valve power supply and the sensor supply. The power supply for the sensors connected to the input modules is separate from the load voltage of the valves.



Key features

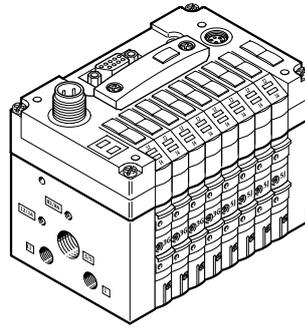
Node types

Fieldbus



CPX with CP interface
CPX-...

Valve terminal



with CP string extension
CPV, CPV-SC, MPA-S

Valve terminal configurator online at: → www.festo.com

The appropriate CPI system can be chosen quickly and easily using the online catalogue. This includes a convenient valve terminal configurator, making it much easier to order the right product.

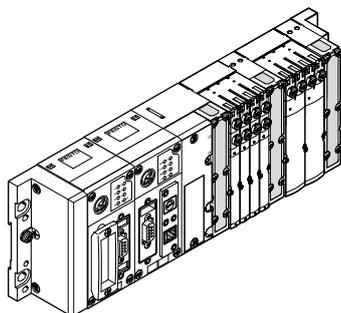
Components from the CPI system series, type CTEC, are ordered using the order code.

Ordering system for type 55E
→ Internet: ctec

Peripherals overview

Integration of the installation system CPI in various connection concepts

Centralised pneumatic connection (valve terminal)



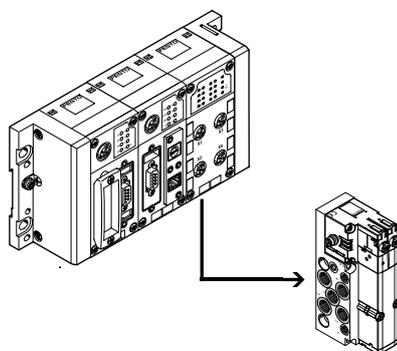
Advantages

- Pneumatic multiple connector plate
- Less tubing required than with individual valves
- Common valve air supply
- 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 assembly on moving systems or in very cramped 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)



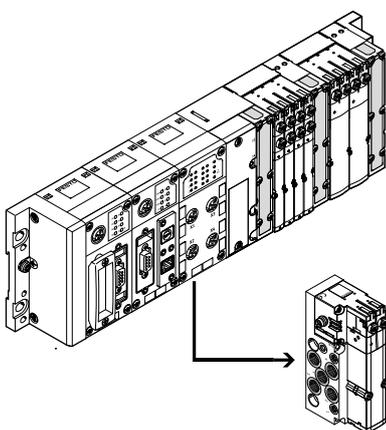
Advantages

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

Disadvantages

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

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



Advantages

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

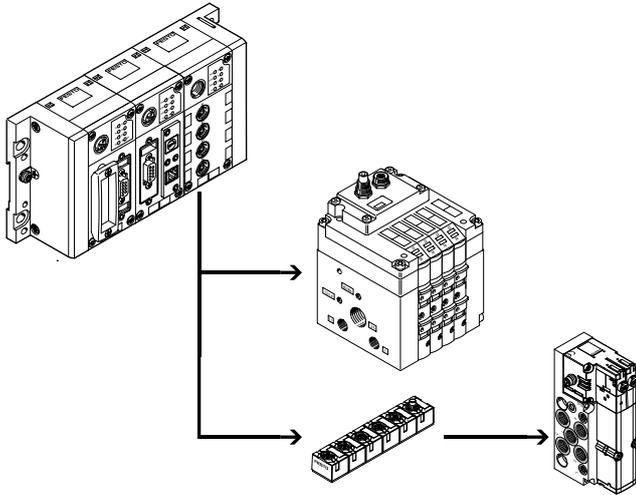
Disadvantages

- Not suitable for individual, more widely separated applications due to the 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)



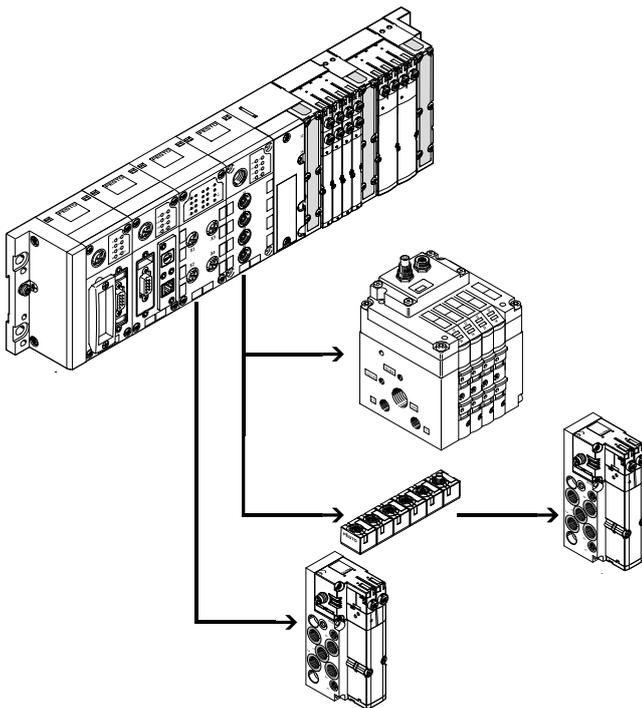
Advantages

- CPI system with reduced installation complexity for groups of actuators/sensors
- Different levels of complexity with widely separated individual components
- Easy replacement of components during servicing
- Optimum pneumatic timing and performance possible

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)



Advantages

- 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

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

Connecting the CPI installation system to a higher-level 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
- INTERBUS
- 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.

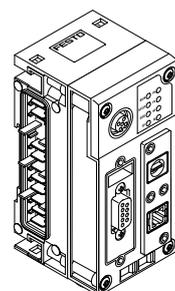
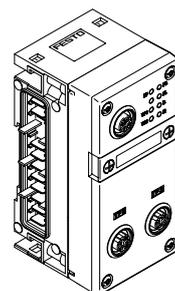
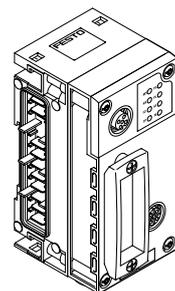
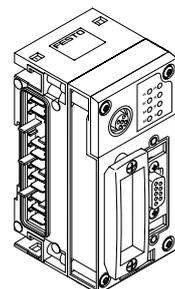
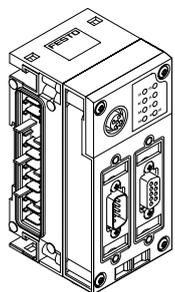
- Ethernet
- TCP/IP
- Web

Peripherals overview

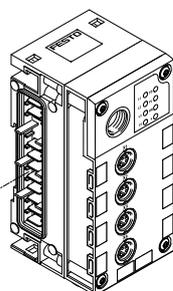
Connecting the CPI installation system to a higher-level controller

Overview

CPX bus node/control block



CPX CP interface



Bus protocol/bus node

INTERBUS

FB6
FB21

Special features

- Up to 96 digital inputs/outputs
- 6 analogue inputs/outputs

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

FB33
FB34
FB35
FB43
FB44
FB45

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

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

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

→ Internet: cpx

Peripherals overview

Connecting modules in the installation system CPI

CP interface within the context 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.

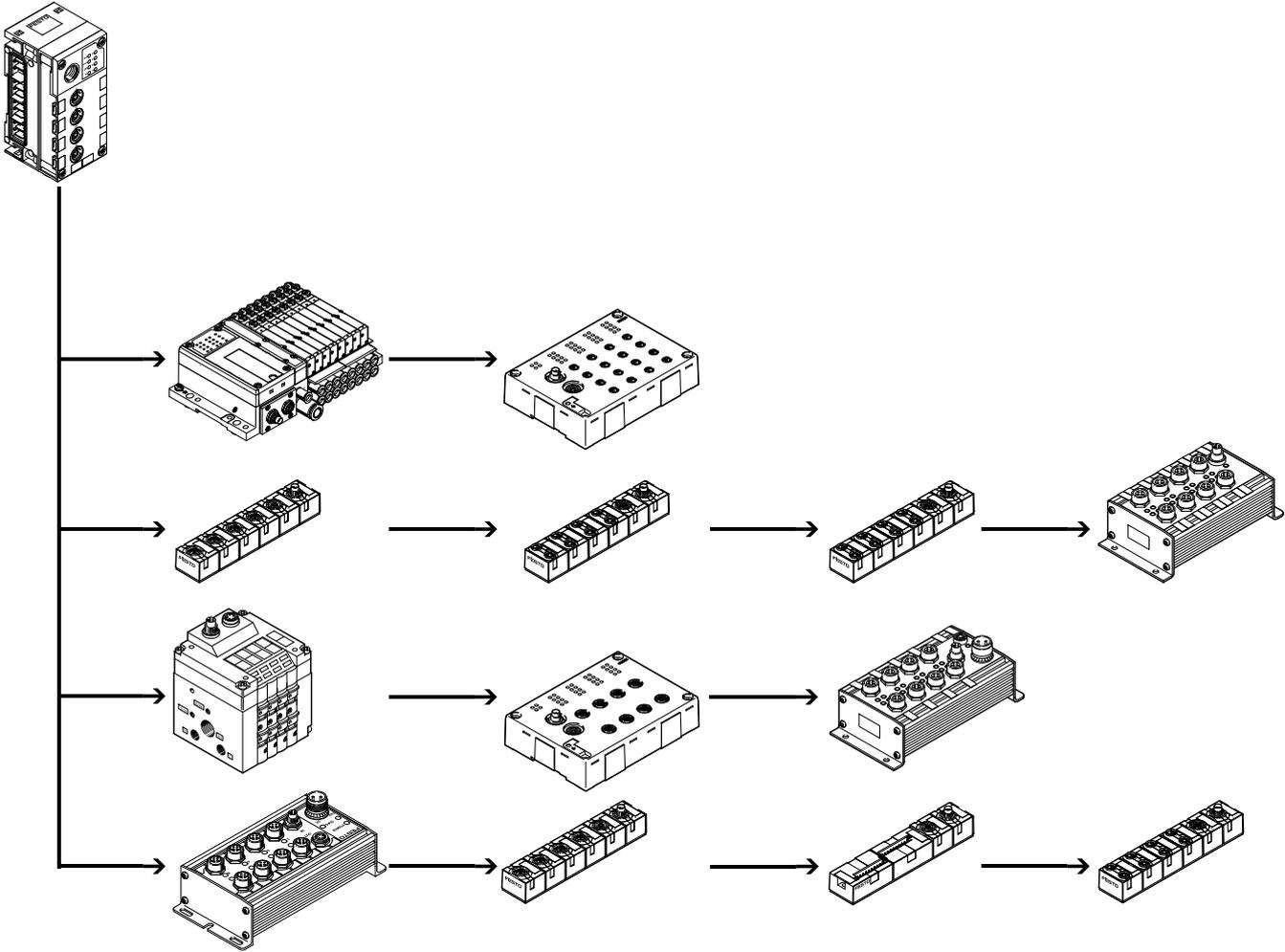
All CP modules are both downwards and upwards compatible and can therefore be used in the CP system and in the CPI system.

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 pre-processing
- Diagnostics via software
- Reading out of status information
- Display via permanently installed or mobile unit
- Remote maintenance with CPX-CEC and Ethernet connection



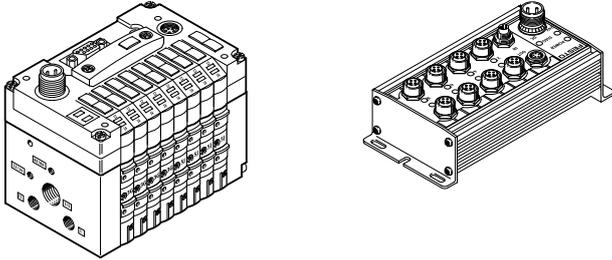
Connection options

Fieldbus Direct			
Special feature	Application	Characteristics of Fieldbus Direct	
<p>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 actuation of the valve terminal and therefore takes up only a minimal amount of space.</p>	<p>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.</p>	<ul style="list-style-type: none"> 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 	<p> Note</p> <p>Detailed description of the range of functions and combination options of CPV valves → Internet: cpv (valve terminal CPV)</p>
Fieldbus Direct and CP string extension			
<p>The optional string extension allows a further valve terminal and I/O modules to be connected to the Fieldbus Direct bus node.</p> <ul style="list-style-type: none"> A CP string of the CP system is integrated in the bus node as an extension. Different input and output modules as well as CPV and MPA-S valve terminals can be connected. 	<p>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.</p>	<p>The CP string interface offers:</p> <ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Load voltage supply for the valve terminal Logic supply for the output module

Connection options

Fieldbus Direct with CP string extension

CPV valve terminal



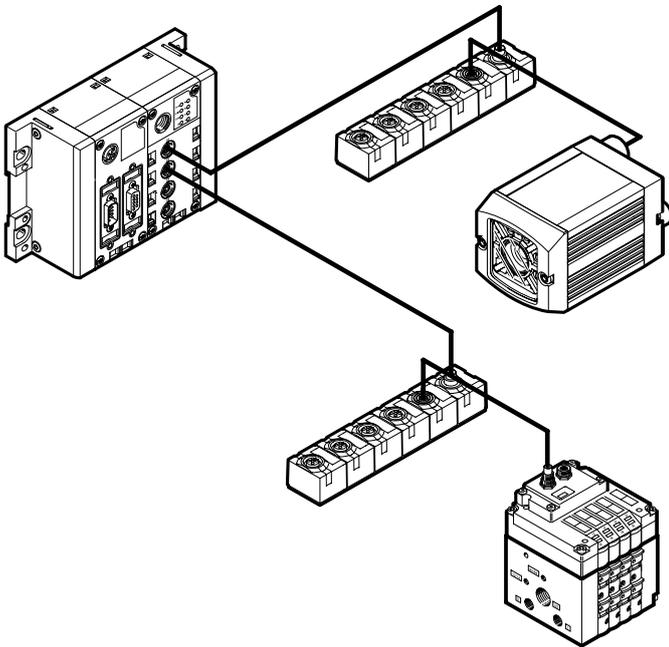
- 4 to 8 valve positions
- DeviceNet

- 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

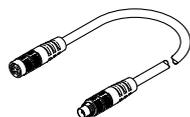
More information

→ Internet: [sboc-q](#), [sboi-q](#)

Connection options

Connecting inputs and outputs in the installation system CPI

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 and compact design or as valve terminal

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

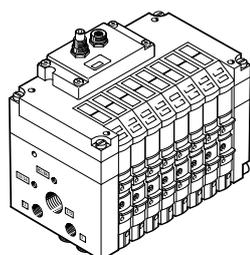
- M12-5POL
- M8-3POL
- M8-4POL
- Spring-loaded terminal or screw terminal technology

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

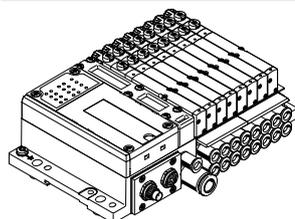


CPV10
CPV14
CPV18

- Max. 16 valves in 8 valve slices
- Highly compact and 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)

MPA-S valve terminal

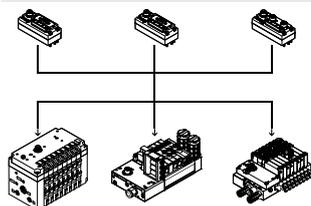


MPA1
MPA14
MPA2

- 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 with I-Port interface



Valve terminals:

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

Flow rate

- 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: [mpal](#)
- Internet: [vtug](#)
- Internet: [cte](#)

Key features – Input/output modules

Connecting inputs and outputs in the installation system CPI

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

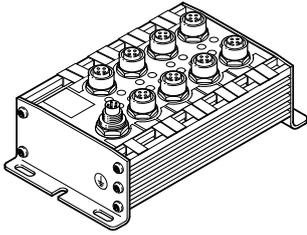
The sturdy CP I/O modules have a highly resistant aluminium housing and their internal electronic components can be repaired or replaced.

As CP-E...Z or as output modules, they 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.

High degree of protection (IP65), surpassed only by the compact CP modules with IP65/67 protection. The only exception is the IP20 protection offered by the module with clamped terminal connection for installation in control cabinets.

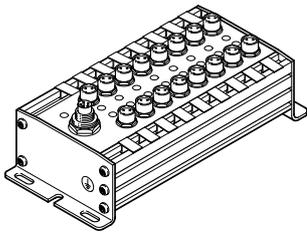
CP input modules in sturdy design



CP-E16-M12x2-5POL

- 16 inputs 24 V DC
- Signal status indication via 16 LEDs
- Operating status indication
- CP functionality

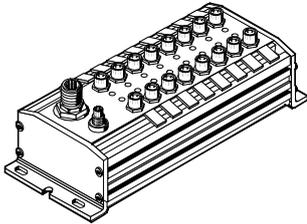
- M12 plug, double allocation
- 1x M9 CP connection
- PNP/NPN, IP65



CP-E16-M8

- 16 inputs 24 V DC
- Signal status indication via 16 LEDs
- Operating status indication
- CP functionality

- M8 plug, single allocation
- 1x M9 CP connection
- PNP/NPN, IP65

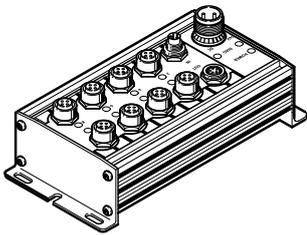


CP-E16-M8-Z

- 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 allocation
- 1x M9 CP connection
- Separate sensor supply
- PNP/NPN, IP65

CP output modules of sturdy design



CP-A08-M12-5POL

- 8 outputs 24 V DC
- Output signal display via 8 LEDs
- Operating status indication
- M12 plug, single allocation
- 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 installation system CPI

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

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

The economical CP modules feature a compact design, coupled with a large number of inputs/outputs. The modules can be used in combination with the following valve terminals:

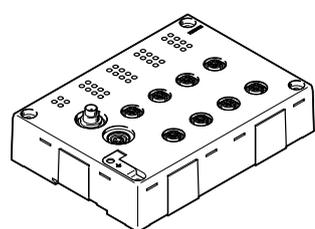
- CPV, MPA-S, CPV-SC

Application:

- Same function, configuration and commissioning as sturdy or compact CP modules
- Integrated H-rail mounting and earthing plate
- Centrally placed status and diagnostic LEDs
- The economical 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

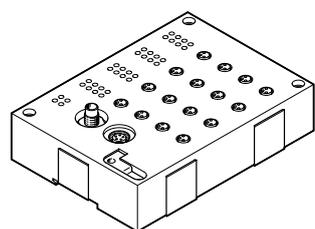
CP input modules in economical design



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 allocation
- 2x M9 CP connection
- PNP, IP65

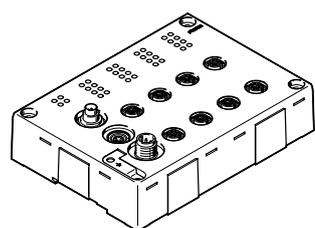


CP-E16-M8-EL

- 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 allocation
- 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 allocation
- 2x M9 CP connection
- Outputs resistant to overloads and short circuits
- PNP, IP65

Key features – Input/output modules

Connecting inputs and outputs in the installation system CPI

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

In addition to the sturdy and economical CP input/output modules, there is also the compact series of CP I/O modules. These have an optimised, space-saving design, are made from plastic and are very light. They are, of course, available with the high degree of protection IP65/67 (exception: clamping modules to IP20 for installation in protected installation spaces).

The compact CP modules are designed for use in handling and assembly wherever space requirements and product weight play a role.

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

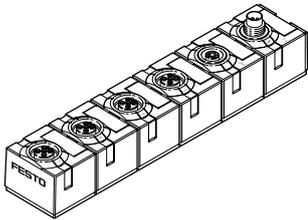
- CPV, MPA-S, CPV-SC

Application:

- The modules can be positioned even closer to the actuators thanks to the smaller dimensions
- Same function, configuration and commissioning as sturdy or economical CP modules
- The compact 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

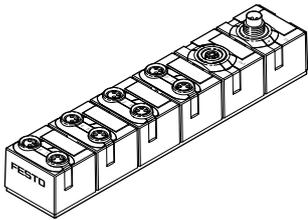
CP input modules in compact design



CP-E08-M12x2-CL

- 8 inputs 24 V DC
- Signal status indication via 8 LEDs
- Operating status indication
- CPI functionality

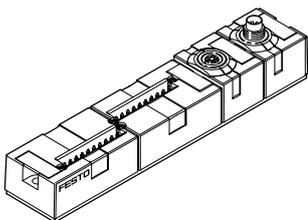
- 4x M12 plug, 5-pin, double allocation
- 2x M9 CP connection
- PNP, IP65/67



CP-E08-M8-CL

- 8 inputs 24 V DC
- Signal status indication via 8 LEDs
- Operating status indication
- CPI functionality

- 8x M8 plug, 3-pin, single allocation
- 2x M9 CP connection
- PNP, IP65/67

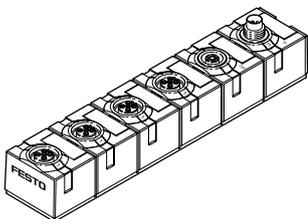


CP-E16-KL-CL

- 16 inputs 24 V DC
- Indirect signal status indication via LEDs in the connection set of the tension-spring socket
- Operating status indication
- CPI functionality

- Screw terminal or tension-spring sockets
- 2x M9 CP connection
- PNP, IP20

CP output modules in compact design



CP-A04-M12x2-CL

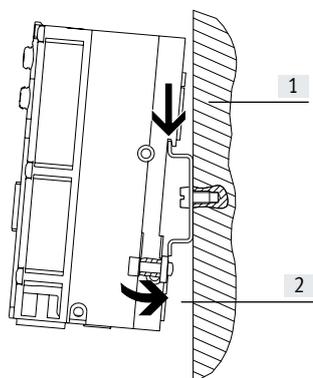
- 4 outputs 24 V DC
- Signal status indication via 4 LEDs
- Operating status indication
- CPI functionality

- 4x M12 plug, 5-pin, double allocation
- 2x M9 CP connection
- Outputs resistant to overloads and short circuits
- PNP, IP65/67

Key features – Mounting options

H-rail mounting

CP interface



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

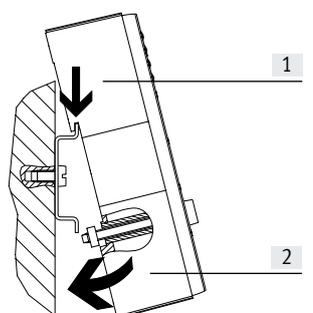
The CPX terminal is first hooked onto the H-rail (see arrow 1), then swivelled onto the H-rail and secured in place with the clamping element (see arrow 2).

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

- CPX-CPA-BG-NRH

This enables mounting on H-rails to EN 60715.

Economical CP modules



The H-rail mounting is impressed in the reverse profile of the economical CP modules. The modules can be attached to the H-rail using the H-rail mounting.

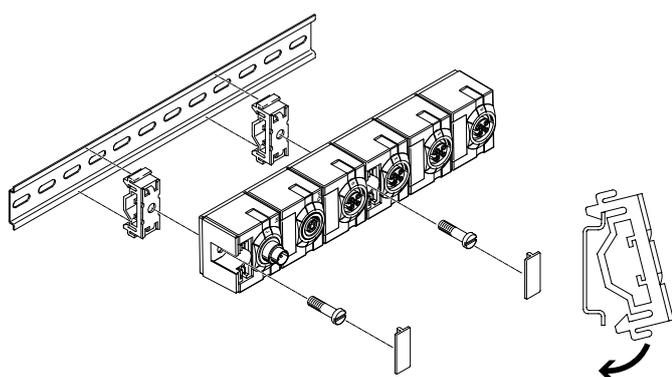
The module is first hooked onto the H-rail (see arrow 1), then swivelled onto the H-rail and secured in place with the clamping element (see arrow 2).

The scope of delivery includes the following mounting kit for H-rail mounting:

- CP-EL-HS

This enables mounting on H-rails to EN 60715.

Compact and sturdy CP modules



For the CP modules there is a mounting kit that can be used on an H-rail. On the compact CP modules, the mounting holes are covered by inscription labels.

The following mounting kit is needed for H-rail mounting:

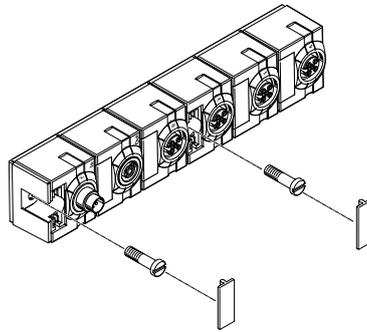
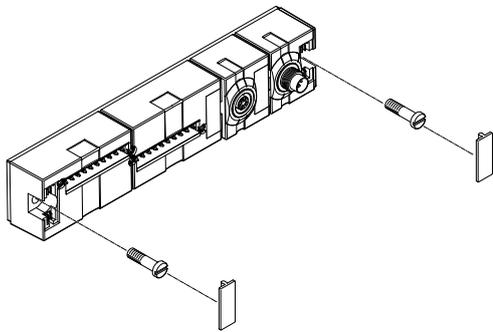
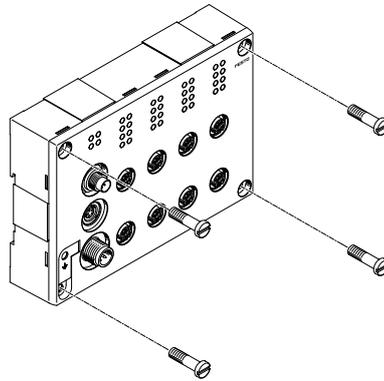
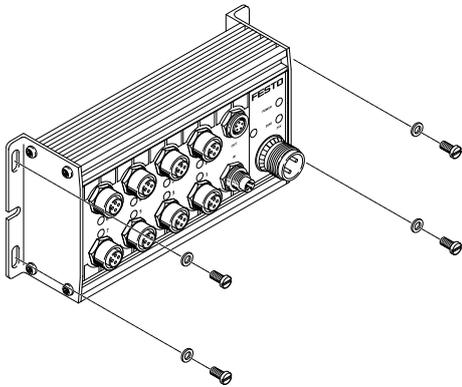
- CP-TS-HS35

This enables mounting on H-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.

-  - **Note**

The mounting holes on the compact CP modules are covered by inscription labels.

Key features – Inscription system

Inscription system

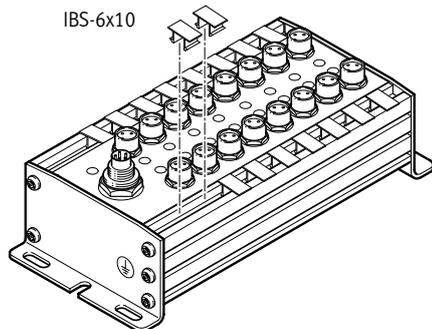
All CP modules have holders for inscription labels.

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

IBS-6x10

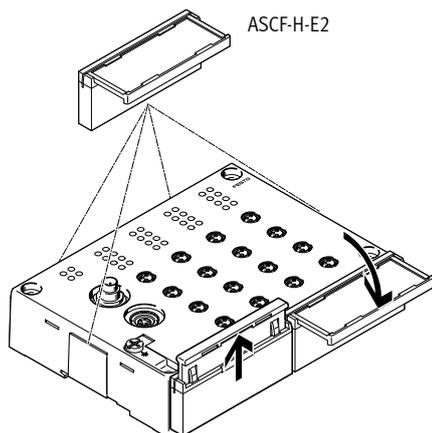


The sturdy CP modules have two slots in which the inscription labels IBS-6x10 (part no. 18576) can be fitted. At least one inscription label can be fitted per connection.

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

Economical CP modules

ASCF-H-E2

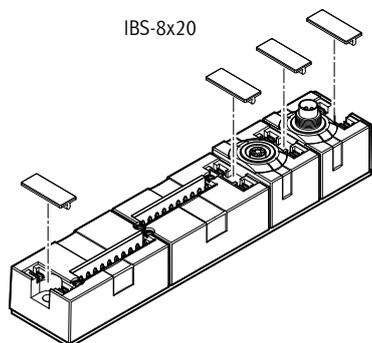


The economical CP modules have six fixtures on the side, each for one inscription label holder ASCF-H-E2 (part no. 547473).

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.

Compact CP modules

IBS-8x20



The compact CP modules have a holder for an inscription label IBS-8x20 (part no. 539388) for each connection.

The IBS-8x20 are plastic clips that can be printed on, written on or affixed with labels.

Key features – Power supply

Operating voltage and load current supply

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

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

CP-E...Z or output modules from the sturdy and the economical series have a separate load voltage supply:

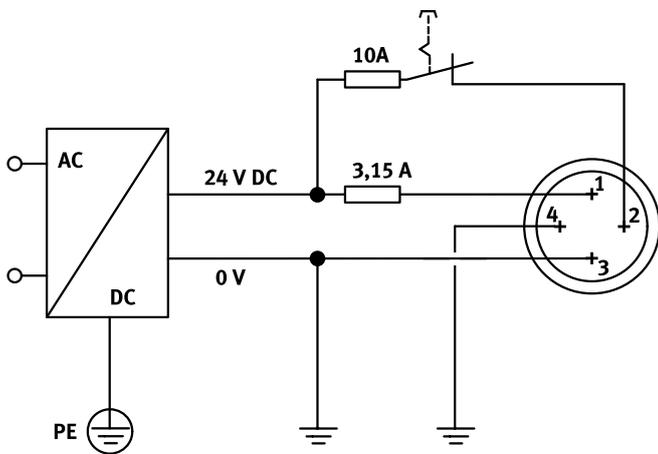
- Less load on the CP interface and CP cable
- 0.5 A per output (max. 4 A supply per output module)
- 1 A per 8 inputs
- Separate disconnection of the consuming devices possible

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, 800 mA in the compact 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 residual 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

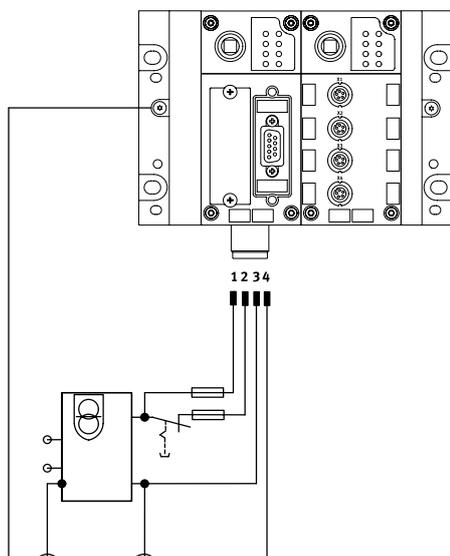
Pin allocation of plug for additional power supply

Terminal allocation	Pin	Signal	Designation
	1	24 V DC	Supply for electronics and inputs
	2	24 V DC	Load supply for valves/outputs
	3	0 V	Equipotential bonding
	4	0 V	Earth terminal and equipotential bonding, rated 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 machine mounting – demands 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

Selectable 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 realisation 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 limits

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-field-bus-specific) or displayed directly on the CPX terminal via the diagnostic interface and then evaluated and processed.

Diagnostics via LEDs

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

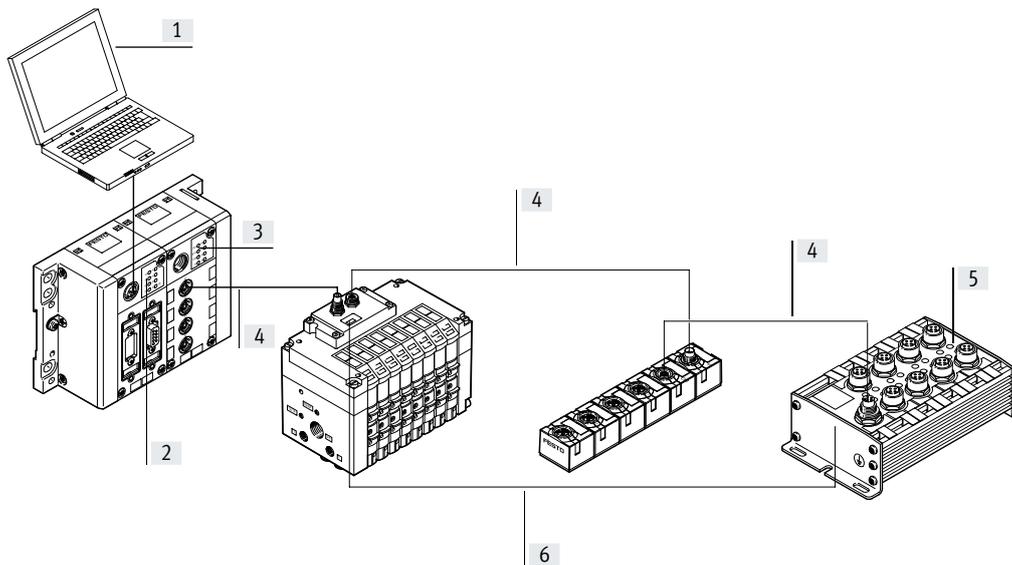
There are also bus-specific LED displays.

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

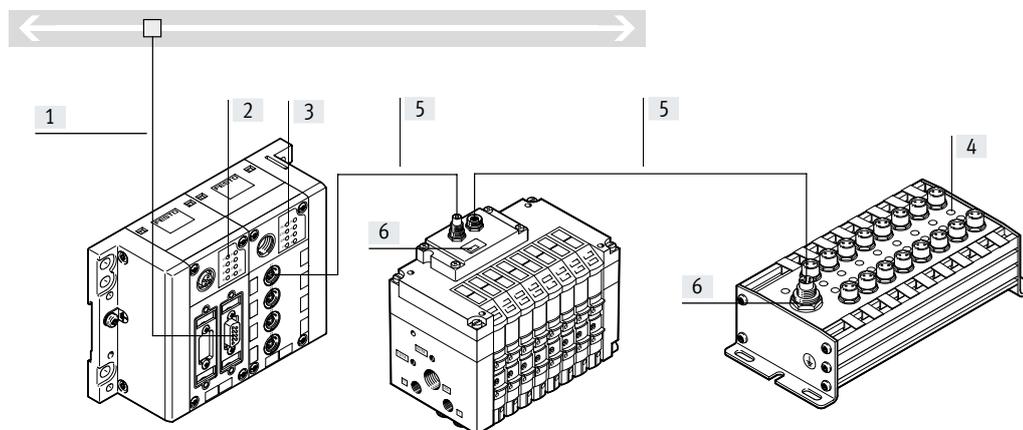


- [1] Diagnostics via controller/bus node
- [2] Bus-specific LEDs
- [3] String diagnostics via LED on the CP interface
- [4] Diagnostics via CP string
- [5] Diagnostics via LED on the CP module
- [6] Status indicator on the CP module

Key features – CP interface

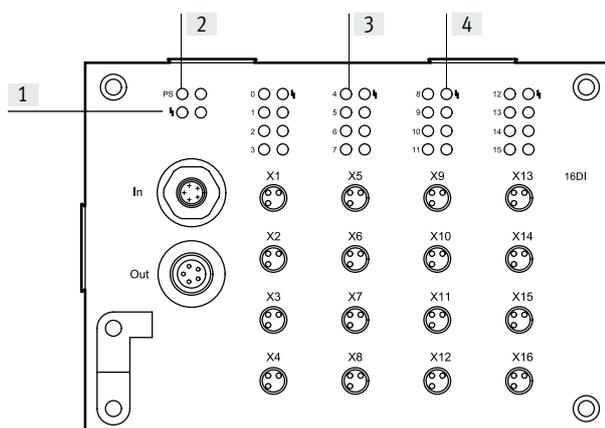
Diagnostics

Diagnostics via CP bus node



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

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). Address allocation is performed in accordance with 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 future 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, an appropriate message is output via the controller 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 a module of identical design 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

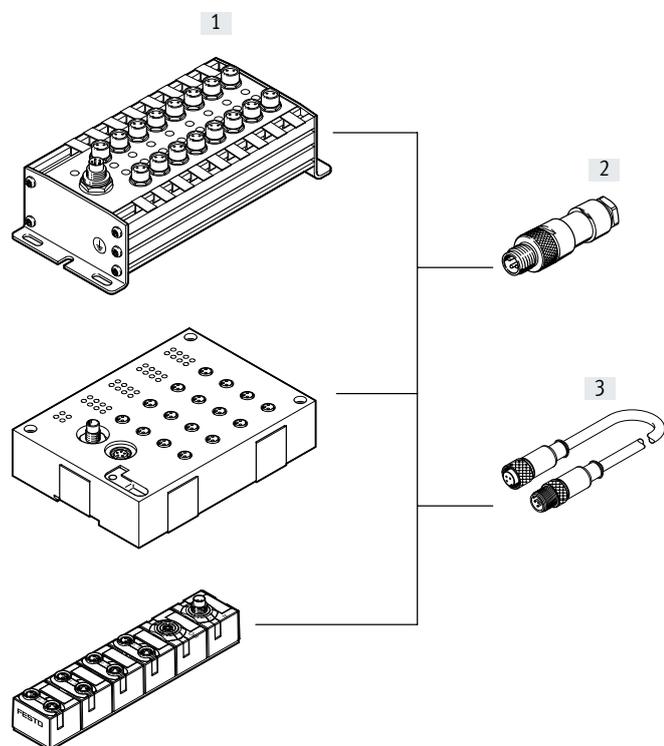
System selection aid					
	Modules per string	Outputs/inputs per string	Modules with CP functionality	Modules with CPI functionality	String length [m]
CP system	2	16/16	0 ... 1 input module 0 ... 1 output module	0 ... 1 input module 0 ... 1 output module	0 ... 10
CPI system	4	32/32	0 ... 1 input module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

Module selection aid							
	Functionality		Additional 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
CP-E08-M12-CL	■	■	–	8	–	0.835	37
CP-E08-M8-CL	■	■	–	8	–	0.835	37
CP-E16-KL-CL	■	■	–	16	–	0.835	37
Output modules							
CP-A08-M12-5POL	■	–	■	–	8	2.09	43
CP-A08-M12-EL-Z	■	■	■	–	8	4	46
CP-A04-M12-CL	■	■	–	–	4	1.035	50
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
CTEU-CP	–	■	–	0/16/32	0/16/32	3.4	54

Selection aid

Accessory selection aid

Connection M8, 3-pin



Note

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

- Tailored to the application
- Perfectly fitting
- Easy to install

[1] Input modules	
Type	
CP-E16-M8	
CP-E16-M8-Z	
CP-E16-M8-EL	
CP-E08-M8-CL	

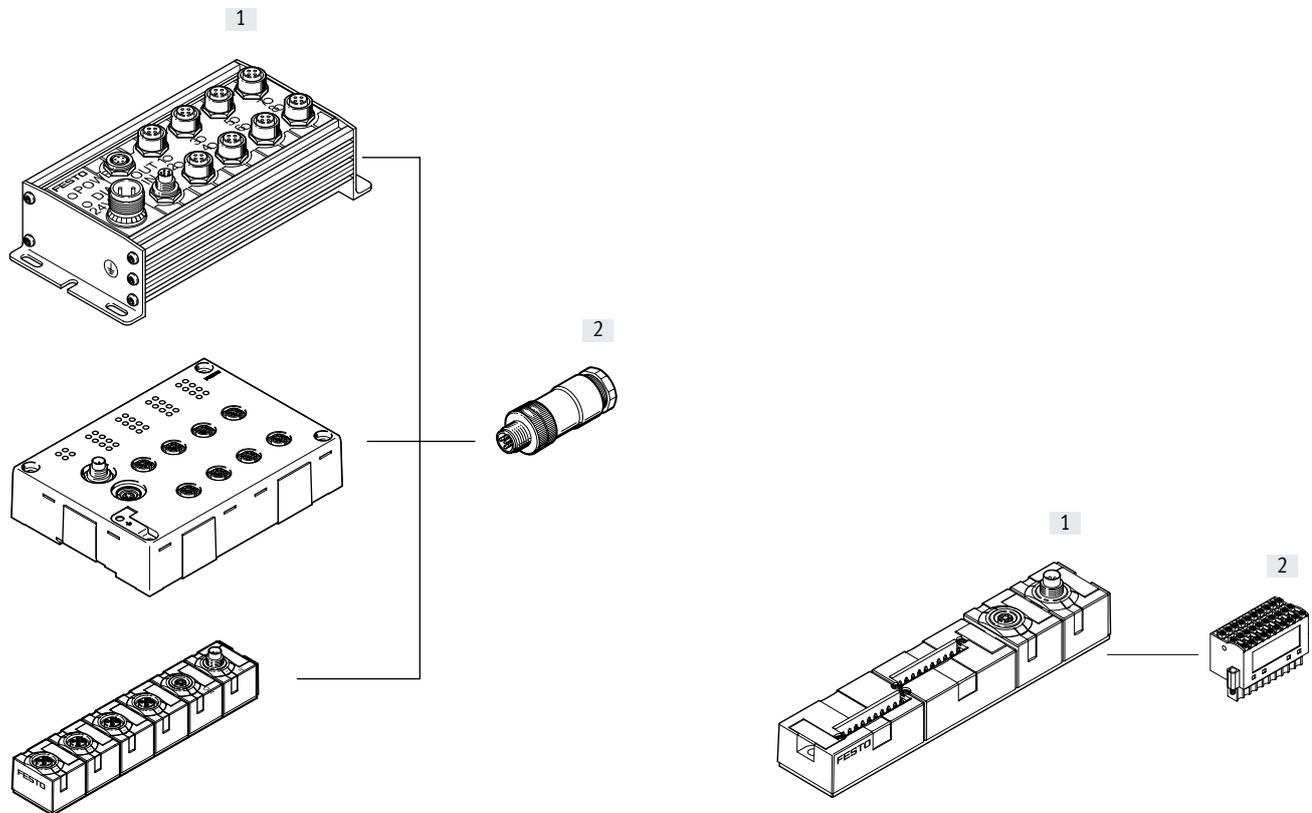
Plug/connecting cable	
Type	Connection technology
[2] Plugs	
SEA-GS-M8	Solder lug
SEA-3GS-M8-S	Screw terminal
[3] Connecting cable	
NEBU-...-M8G3	Socket M8, 3-pin
	Socket M8, 4-pin
	Socket M12, 5-pin
	Open cable end

Selection aid

Accessory selection aid

Connection for inputs M12, 5-pin

Connection for inputs, tension-spring socket



[1] Input modules

[2] Plugs

Type
CP-E16-M12x2-5POL
CP-E16N-M12-EL
CP-E08-M12-CL

Type	Connection technology
SEA-M12-5GS-PG7	Screw terminal
SEA-5GS-11-DUO	Screw terminal

[1] Input modules

[2] Plugs

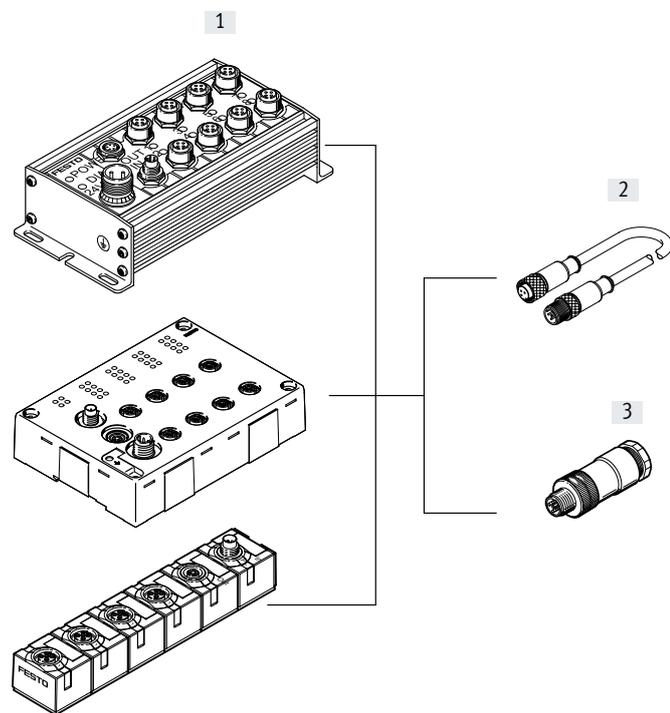
Type
CP-E16-KL-CL

Type	Connection technology
PS1-SAC31-30POL+LED	Screw-in tension-spring socket

Selection aid

Accessory selection aid

Connection for outputs M12, 5-pin



[1] Output modules

Type
CP-A08-M12-5POL
CP-A08-M12-EL-Z
CP-A04-M12-CL

Plug/connecting cable

Type	Connection technology
[2] Connecting cable	
NEBU-...-M12G5 (modular system for choice of connecting cables)	Socket M12, 5-pin Open cable end
[3] Plugs	
SEA-M12-5GS-PG7	Screw terminal
SEA-5GS-11-DUO	Screw terminal

Data sheet – 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 allocation are separated using a sensor/actuator distributor.

Area of application

- Input modules for 24 V DC sensor signals
- M8 and M12 plugs, single allocation with 16 connections, double allocation with 8 connections
- M12 plug, 5-pin
- The input statuses for each input signal are indicated via an assigned LED
- 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			CP-E16-M8	CP-E16-M12x2-5POL
Type			Positive switching	Positive switching
Number of inputs			16	
Allocation of inputs			Single allocation	Double allocation
Sensor connection type			16x M8, 3-pin	8x M12, 5-pin
Power supply 24 V DC			Coming from 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, residual current		[A]	Max. 0.5	
Sensor supply voltage		[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			To IEC 1131-2	
Connection to bus node			Via pre-assembled cables	
Degree of protection to EN 60529			IP65 (when fully plugged in or fitted with protective cover)	
Temperature range		Operation [°C]	-5 ... +50	
		Storage [°C]	-20 ... +70	
Material			Die-cast aluminium	
Note on materials			RoHS-compliant	
Dimensions		[mm]	148.9 x 66 x 47.9	140.9 x 78 x 55.2
Weight		[g]	400	500

Data sheet – Input modules CP-E16

General technical data				
Type	CP-E16-M8-Z Positive and negative switching			
Number of inputs	16			
Allocation of inputs	Single allocation			
Sensor connection type	16x M8, 3-pin			
Power supply 24 V DC	Coming from 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, residual current	[A]	Max. 1 per group of 8 inputs		
Sensor supply voltage	[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]	Typically 3		
Switching logic	PNP/NPN			
Input characteristic	To IEC 1131-2			
Connection to bus node	Via pre-assembled cables			
Degree of protection to EN 60529	IP65 (when fully plugged in or fitted with protective cover)			
Temperature range	Operation	[°C]	-5 ... +50	
	Storage	[°C]	-20 ... +70	
Material	Die-cast aluminium			
Note on materials	RoHS-compliant			
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 na II T5 X Gc		
ATEX category for dust	II 3D		
Type of ignition protection for dust	Ex tc IIIC T80°C X Dc IP65		
ATEX ambient temperature	[°C]	-5 ≤ Ta ≤ +50	
CE marking (see declaration of conformity)	To EU EMC Directive ¹⁾ To EU Explosion Protection Directive (ATEX)		
KC mark	KC EMC		
Certification	c UL us - Recognized (OL) C-Tick		

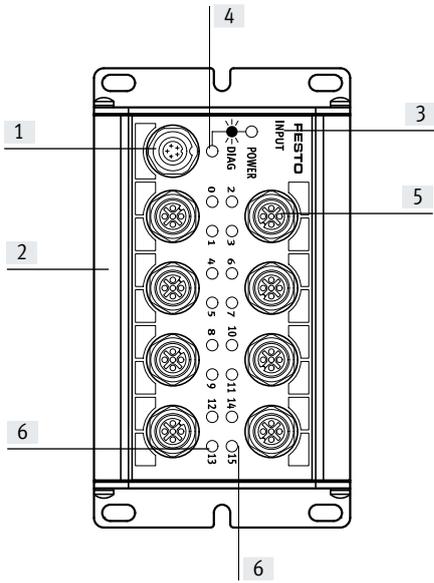
1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp → Certificates.

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.

Data sheet – 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 allocation for sensor connections CP-E16-M12x2-5Pol

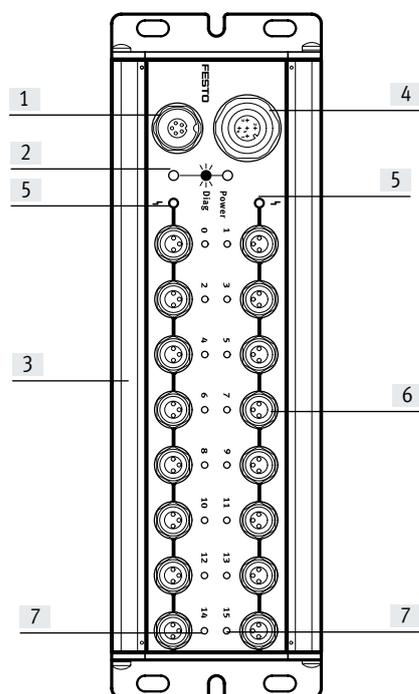
Terminal allocation	Pin	Signal	Designation	Pin	Signal
	1	24 V	Operating voltage 24 V	1	24 V
	2	Ix+1*	Sensor signal	2	Ix+3*
	3	0 V	Operating voltage 0 V	3	0 V
	4	Ix*	Sensor signal	4	Ix+2*
	5	Mass	Earth terminal	5	Mass

* Ix = Input x

Data sheet – 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 indication of 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 allocation for external sensor supply CP-E16-M8-Z

Terminal allocation	Pin	Signal	Designation	
	1	24 V DC ±25%	Operating voltage	<p>Note</p> <p>External sensor supply for CP-E16-M8-Z: Specified for PNP or NPN operation (type CP-E16-M8-Z).</p> <p>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.</p>
	2	PNP/NPN	Coding with negative/positive switching: <ul style="list-style-type: none"> • 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	Mass	Earth terminal	

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

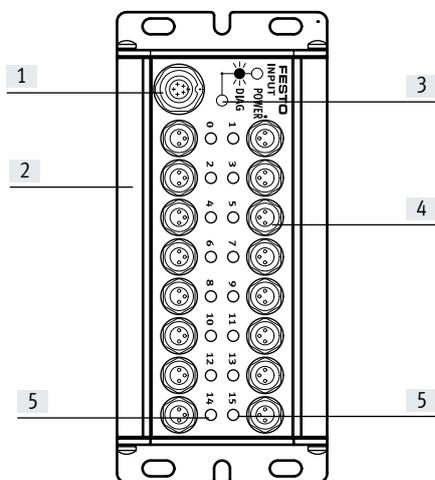
Terminal allocation	Pin	Signal	Designation	Pin	Signal
	1	24 V	Operating voltage 24 V	1	24 V
	3	0 V	Operating voltage 0 V	3	0 V
	4	I _x *	Sensor signal	4	I _{x+1} *

* I_x = Input x

Data sheet – Input modules CP-E16

Connection and display components

CP-E16-M8



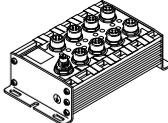
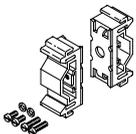
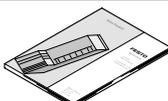
- [1] CP connection
- [2] Slot for identification labels (IBS-6x10)
- [3] Status LED (green)
- [4] Sensor connections
- [5] Green LED for status indication (one LED per input)

Pin allocation – Sensor connections CP-E16-M8

Terminal allocation	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						
Designation					Part no.	Type
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			18324	FBSD-GD-9-5POL	
Sensor plug						
	Plug, straight socket, M12x1	5-pin	PG7	175487	SEA-M12-5GS-PG7	
		4-pin	PG7	18666	SEA-GS-7	
		4-pin	2.5 mm ² O.D.	192008	SEA-4GS-7-2.5	
	Plug, straight, M8x1	3-pin	Solderable	18696	SEA-GS-M8	
			Screw-in	192009	SEA-3GS-M8-S	
	Plug for 2 connecting cables, M12x1, PG11		4-pin	18779	SEA-GS-11-DUO	
			5-pin	192010	SEA-5GS-11-DUO	
Connecting cables						
	Connecting cable M8-M8	3-pin	Straight plug/straight socket	0.5 m	541346	NEBU-M8G3-K-0.5-M8G3
				1.0 m	541347	NEBU-M8G3-K-1-M8G3
				2.5 m	541348	NEBU-M8G3-K-2.5-M8G3
				5.0 m	541349	NEBU-M8G3-K-5-M8G3
	Modular system for a choice of connecting cables				–	NEBU-... → Internet: nebu
Mounting						
	Mounting for H-rail			170169	CP-TS-HS35	
User documentation						
	User documentation for input/output modules			German	165125	P.BE.-CPEA-DE
				English	165225	P.BE.-CPEA-EN
				French	165127	P.BE.-CPEA-FR
				Italian	165157	P.BE.-CPEA-IT
				Spanish	165227	P.BE.-CPEA-ES

Data sheet – Input modules CP-E...-EL

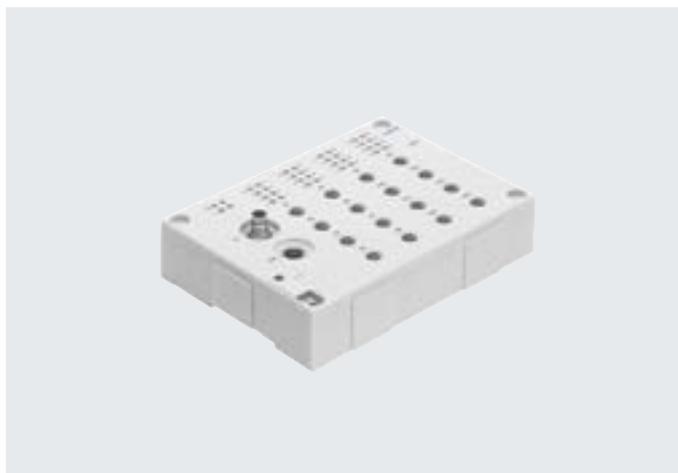
Function

Digital input modules make it easier to connect proximity switches or other 24 V DC sensors (inductive, capacitive, etc.).

Plugs with double allocation are separated using a sensor/actuator distributor.

Area of application

- Input modules for 24 V DC sensor signals
- M8 and M12 connection technology
- Display 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
- Circumferential labelling with large, hinged inscription label
- Earthing plate and H-rail mounting already integrated



General technical data			CP-E16-M12-EL	CP-E16-M8-EL
Type			Positive switching	Positive switching
Number of inputs			16	
Allocation of inputs			Double allocation	Single allocation
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. residual current per module	[A]		0.7	
Nominal operating voltage			24	
Operating voltage range	[V DC]		18 ... 30	
Residual ripple load voltage	[Vss]		4	
Electrical 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			To IEC 1131-T2	
Connection to bus node			Via pre-assembled cables	
Diagnostics			CP communication	
			Short circuit/overload	
			Undervoltage	
LED displays			2 module diagnostics	2 module diagnostics
			16 channel status	16 channel status
			4 group diagnostics	4 group diagnostics

Data sheet – Input modules CP-E...-EL

Materials	
Housing	Reinforced PA
Cover	Reinforced PA
Note on materials	RoHS-compliant
Operating and environmental conditions	
Degree of protection to EN 60529	IP65/IP67 (when fully plugged in or fitted with protective cap)
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⁾
KC mark	KC EMC
Certification	c UL us listed (OL)
	C-Tick

1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

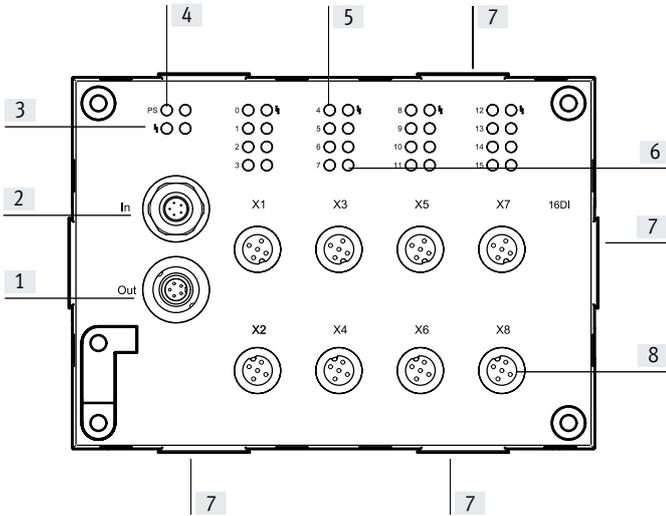
2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp → Certificates.

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.

Data sheet – Input modules CP-E...-EL

Connection and display components

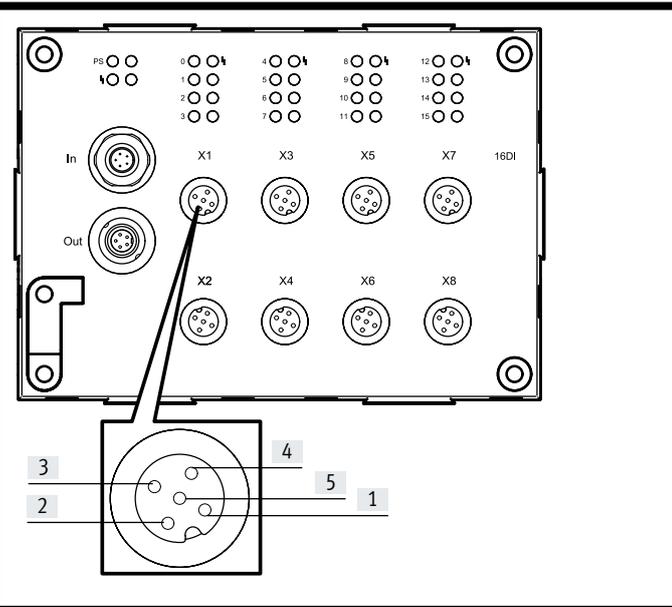
CP-E16-M12-EL



- [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] Fixture for inscription label holder ASCF-H-E2
- [8] Sensor connections (2 inputs per socket)

Pin allocation for sensor connections CP-E16-M12-EL

Terminal allocation



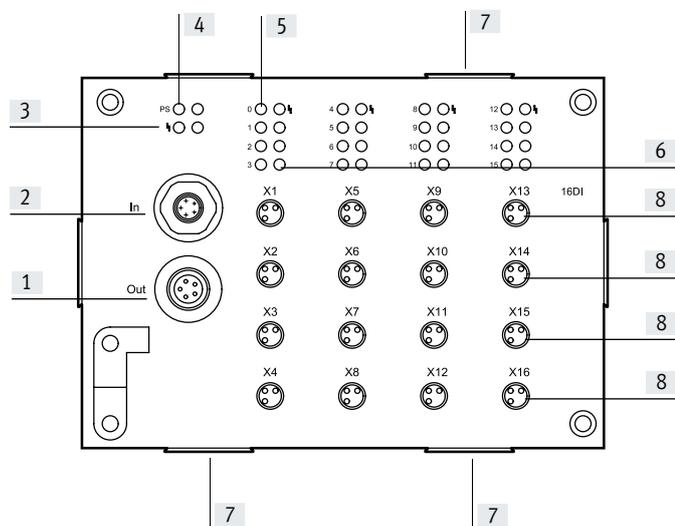
Pin	Signal	Designation
1	24 V	Operating voltage 24 V
2	Ix+1*	Sensor signal
3	0 V	Operating voltage 0 V
4	Ix*	Sensor signal
5	Mass	Earth terminal

* Ix = Input x

Data sheet – Input modules CP-E...-EL

Connection and display components

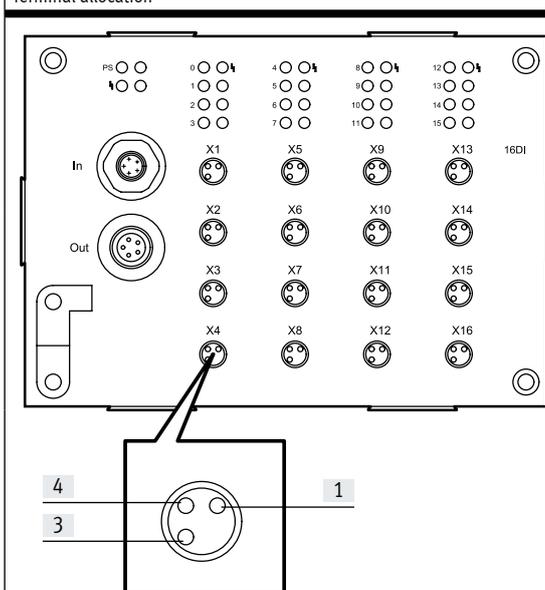
CP-E16-M8-EL



- [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] Fixture for inscription label holder ASCF-H-E2
- [8] Sensor connections (1 input per socket)

Pin allocation for sensor connections CP-E16-M8-EL

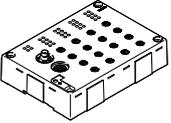
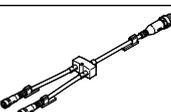
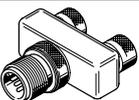
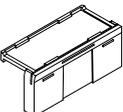
Terminal allocation



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					
	Plug, straight socket, M12x1	5-pin	PG7	175487	SEA-M12-5GS-PG7
		4-pin	PG7	18666	SEA-GS-7
		4-pin	2.5 mm ² O.D.	192008	SEA-4GS-7-2.5
	Plug, straight, M8x1	3-pin	Solderable	18696	SEA-GS-M8
			Screw-in	192009	SEA-3GS-M8-S
	Plug for 2 connecting cables, M12x1, PG11		4-pin	18779	SEA-GS-11-DUO
			5-pin	192010	SEA-5GS-11-DUO
Distributors					
	Modular system for all types of sensor/actuator distributor			-	NEDY-... → Internet: nedy
	Push-in T-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

Data sheet – Input modules CP-E...-CL

Function

Digital input modules make it easier to connect proximity switches or other 24 V DC sensors (inductive, capacitive, etc.).

Plugs with double allocation are separated using a sensor/actuator distributor.

Area of application

- Input modules for 24 V DC sensor signals
- M8 and M12 plug connection technology
- M12 input module, inputs with double allocation. M8 inputs with single allocation
- M12 plug, 5-pin
- The input statuses for each input signal are indicated via an assigned LED
- 24 V DC supply provided for all connected sensors
- Diagnostic LED for short circuit/undervoltage of sensor supply.
- Modules support the CPI functionality (only in combination with the CPX CP interface)



General technical data		CP-E08-M12-CL	CP-E08-M8-CL	CP-E16-KL-CL
Type		Positive switching	Positive switching	Positive switching
Number of inputs		8		16
Allocation of inputs		Double allocation	Single allocation	
Sensor connection type		4x M12, 5-pin	8x M8, 3-pin	Spring-loaded terminals or screw terminals
Power supply 24 V DC		From the bus node, basic unit, CP interface, etc.		
Intrinsic current consumption of electronics	[mA]	Typically 35 (inputs not connected)		
Input current at 24 V DC (from sensor)	[mA]	Typically 6		
Fuse protection for sensors and electronics modules		Internal electronic short circuit protection		
Max. current consumption for sensor supply, residual current	[A]	Max. 0.8		
Nominal operating voltage for sensors		24		
Operating voltage range for sensors	[V DC]	18 ... 30		
Reverse polarity protection		For logic and sensor supply		
Galvanic isolation		None		
Switching level	Signal 0	[V]	≤5	
	Signal 1	[V]	≥-11	
Input delay		[ms]	Typically 3	
Switching logic			PNP	
Input characteristic			To IEC 1131-2	
Connection to bus node			Via pre-assembled cables	
Diagnostics			Undervoltage	
			Short circuit/overload in sensor supply	

Data sheet – Input modules CP-E...-CL

General technical data				
Type		CP-E08-M12-CL Positive switching	CP-E08-M8-CL Positive switching	CP-E16-KL-CL Positive switching
Note on materials		RoHS-compliant		
Dimensions (WxLxH)	[mm]	151 x 30 x 25		
Weight	[g]	165	190	145
Operating and environmental conditions				
Type		CP-E08-M12-CL	CP-E08-M8-CL	CP-E16-KL-CL
Degree of protection to EN 60529		IP65/IP67 (when fully plugged in or fitted with protective cap)		IP20
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 Explosion Protection Directive (ATEX)		-
Certification		c UL us listed (OL)		
		C-Tick		

1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).
For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp → Certificates.

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 certifications				
Type		CP-E08-M12-CL	CP-E08-M8-CL	CP-E16-KL-CL
ATEX category for gas		II 3G		-
Type of ignition protection for gas		Ex nA IIC T6 X Gc		-
ATEX category for dust		II 3D		-
Type of ignition protection for dust		Ex tc IIIC T70°C X Dc IP67		-
ATEX ambient temperature	[°C]	-5 ≤ Ta ≤ +50		-

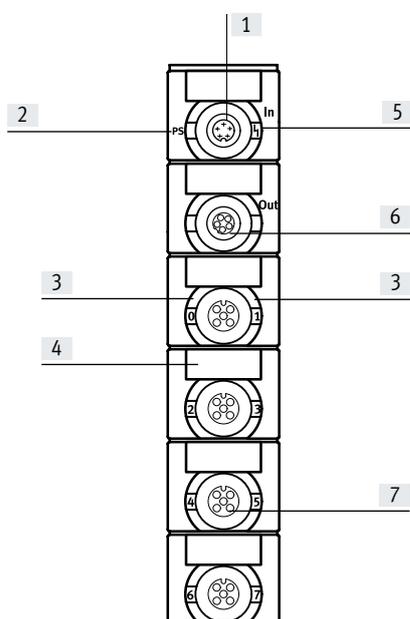
 **Note**

When operating device combinations in potentially explosive areas, the lowest common zone, temperature class and ambient temperature of the individual devices determine the possible use of the entire module.

Data sheet – Input modules CP-E...-CL

Connection and display components

CP-E08-M12-CL



- [1] CP connection, incoming
- [2] Status LED (green)
- [3] Green LED for status indication (one LED per input)
- [4] Holder for inscription label (IBS-8x20)
- [5] Red LED for short circuit/overload display
- [6] CP connection, outgoing
- [7] Sensor connections

Pin allocation for sensor connections CP-E08-M12-CL

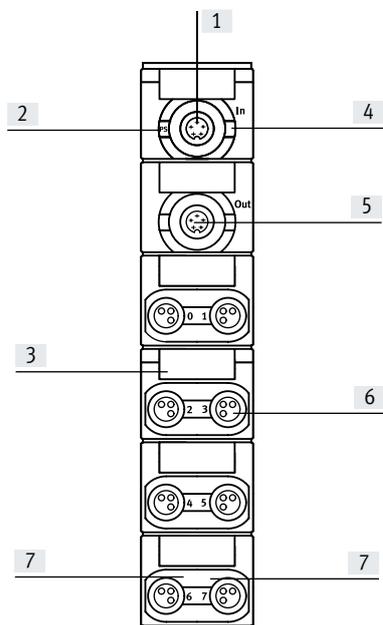
Terminal allocation	Pin	Signal	Designation
	1	24 V	Operating voltage 24 V
	2	I _x +1*	Sensor signal
	3	0 V	Operating voltage 0 V
	4	I _x *	Sensor signal
	5	Mass	Earth terminal

* I_x = Input x

Data sheet – Input modules CP-E...-CL

Connection and display components

CP-E08-M8-CL



- [1] CP connection, incoming
- [2] Status LED (green)
- [3] Holder for inscription label (IBS-8x20)
- [4] Red LED for short circuit/overload display
- [5] CP connection, outgoing
- [6] Sensor connections
- [7] Green LED for status indication (one LED per input)

Pin allocation for sensor connections CP-E08-M8-CL

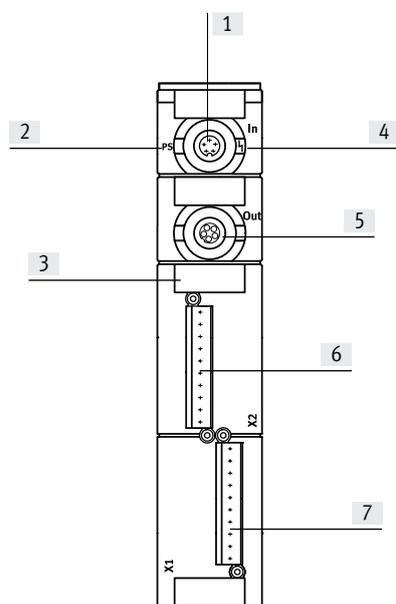
Terminal allocation	Pin	Signal	Designation	Pin	Signal
	1	24 V	Operating voltage 24 V	1	24 V
	3	0 V	Operating voltage 0 V	3	0 V
	4	Ix*	Sensor signal	4	Ix+1*

* Ix = Input x

Data sheet – Input modules CP-E...-CL

Connection and display components

CP-E16-KL-CL



- [1] CP connection, incoming
- [2] Status LED (green)
- [3] Holder for inscription label (IBS-8x20)
- [4] Red LED for short circuit/overload display
- [5] CP connection, outgoing
- [6] Sensor connections, plug X2
- [7] Sensor connections, plug X1

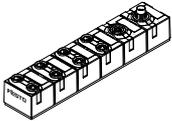
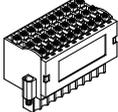
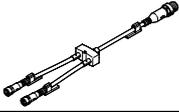
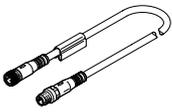
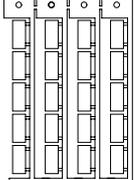
Pin allocation – Sensor supply CP-E16-KL-CL

Terminal allocation	Pin	Signal	Designation	Pin	Signal	
	Plug X1			Plug x2		<p>Note</p> <p>8 sensors can be connected to each of the connections X1 and X2. When using the three-row plug PS1-SAC31-30POL+LED, it is possible to use the second and third row contacts for the sensor power supply via a bridge.</p>
	+	24 V DC	Operating voltage	+	24 V DC	
	0	I 0	Connections for sensors	0	I 8	
	1	I 1		1	I 9	
	2	I 2		2	I 10	
	3	I 3		3	I 11	
	4	I 4		4	I 12	
	5	I 5		5	I 13	
	6	I 6		6	I 14	
	7	I 7		7	I 15	
	-	0 V DC		-	0 V DC	

Plug connection for power supply for sensors (PS1-SAC31-30POL+LED)

	Connection row 0		Connection row 1		Connection row 2	
	Pin	Signal	Pin	Signal	Pin	Signal
-	0 V DC	Operating voltage	-	n.c.	-	Bridge
7	I x+7	Connections for sensors	7	24 V DC	7	0 V DC
6	I x+6		6		6	
5	I x+5		5		5	
4	I x+4		4		4	
3	I x+3		3		3	
2	I x+2		2		2	
1	I x+1		1		1	
0	I x		0		0	
+	24 V DC	Operating voltage	+	Bridge	+	n.c.

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

Ordering data		Part no.	Type		
Designation					
Input modules					
	Positive switching	538787	CP-E08-M12-CL		
	Positive switching	538788	CP-E08-M8-CL		
	Positive switching	538789	CP-E16-KL-CL		
Sensor plug					
	Plug, straight socket, M12x1	5-pin	PG7	175487	SEA-M12-5GS-PG7
		4-pin	PG7	18666	SEA-GS-7
		4-pin	2.5 mm ² O.D.	192008	SEA-4GS-7-2.5
	Plug, straight, M8x1	3-pin	Solderable	18696	SEA-GS-M8
Screw-in			192009	SEA-3GS-M8-S	
	Plug for 2 connecting cables, M12x1, PG11	4-pin		18779	SEA-GS-11-DUO
		5-pin		192010	SEA-5GS-11-DUO
Connection sets for sensors					
	Plug, screw-in tension-spring socket with LED	3-row, 30-pin	197162	PS1-SAC31-30POL+LED	
Distributors					
	Modular system for all types of sensor/actuator distributor		–	NEDY... → Internet: nedy	
Connecting cable					
	Modular system for a choice of connecting cables		–	NEBU... → Internet: nebu	
Inscription labels					
	Inscription labels 8x20 mm, in frame (20 pieces)		539388	IBS-8x20	
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	

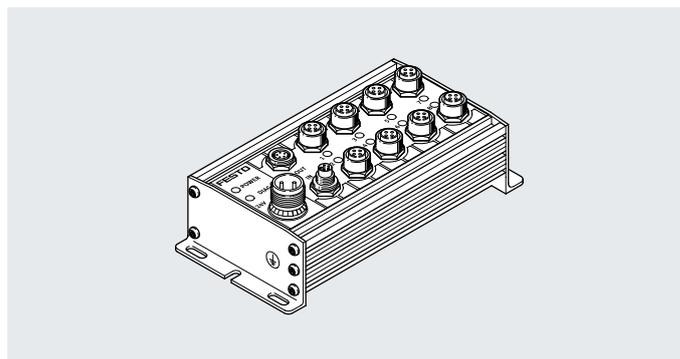
Data sheet – Output modules CP-A08

Function

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

Area of application

- Output module with 8 outputs
24 V DC
- M12 connection technology, 5-pin socket
- LED display of 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	
Allocation of outputs	Single allocation	
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	Operation	[°C] -5 ... +50
	Storage	[°C] -20 ... +70
Material	Die-cast aluminium	
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 na IIC T5 X Gc	
ATEX category for dust	II 3D	
Type of ignition protection for dust	Ex tc IIIC T80°C X Dc IP65	
ATEX ambient temperature	[°C]	-5 ≤ Ta ≤ +50
CE marking (see declaration of conformity)	To EU EMC Directive ¹⁾	
	To EU Explosion Protection Directive (ATEX)	
KC mark	KC EMC	
Certification	c UL us - Recognized (OL)	

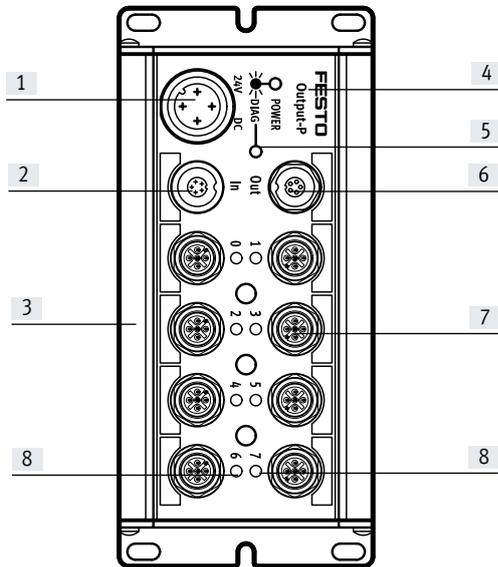
1) For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp → Certificates.

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.

Data sheet – 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 display (one LED per input)

Pin allocation for load voltage connection CP-A08-M12...

Terminal allocation	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 earthing

Pin allocation for outputs

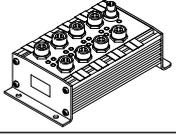
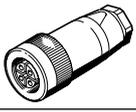
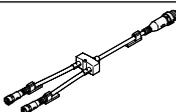
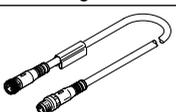
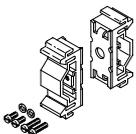
Terminal allocation	Pin	Signal	Designation	Pin	Signal
CP-A08-M12-5POL (PNP outputs)					
	1	n.c.	Not connected	1	n.c.
	2	Ox+1	Connected with pin 4 of plug 2/not connected	2	n.c.
	3	0 V	Reference potential	3	0 V
	4	Ox	Output/connected with pin 2 of plug 1	4	Ox+1
	5	Mass	Earth terminal	5	Mass

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 mm ²	18493 NTSD-GD-9
		For 2.5 mm ²	18526 NTSD-GD-13.5
	Power supply socket, angled, M18x1, 4-pin	For 1.5 mm ²	18527 NTSD-WD-9
		For 2.5 mm ²	533119 NTSD-WD-11
Sensor plug			
	Plug, straight socket, M12x1	5-pin	175487 SEA-M12-5GS-PG7
	Plug for 2 connecting cables, M12x1, PG11	4-pin	18779 SEA-GS-11-DUO
		5-pin	192010 SEA-5GS-11-DUO
Distributors			
	Modular system for all types of sensor/actuator distributor	-	NEDY-... → Internet: nedy
Connecting cable			
	Modular system for a choice of connecting cables	-	NEBU-... → Internet: nebu
Mounting			
	Mounting for H-rail	170169	CP-TS-HS35
User documentation			
	User documentation for input/output modules	German	165125 P.BE.-CPEA-DE
		English	165225 P.BE.-CPEA-EN
		French	165127 P.BE.-CPEA-FR
		Italian	165157 P.BE.-CPEA-IT
		Spanish	165227 P.BE.-CPEA-ES

Data sheet – Output modules CP-A08-EL

Function

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

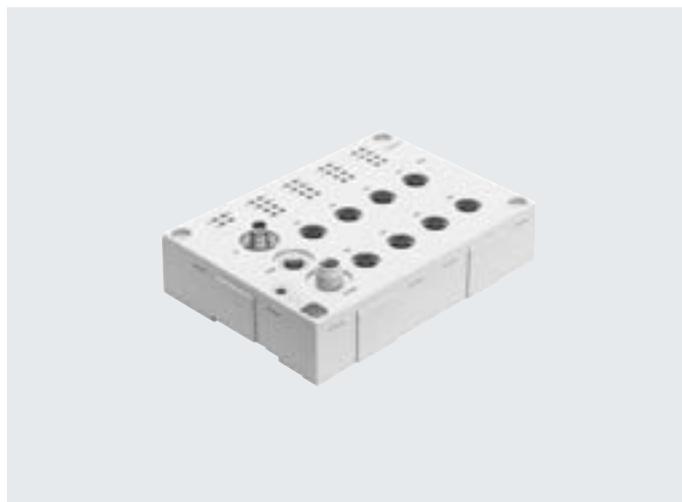


Note

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

Area of application

- Output module with 8 outputs 24 V DC
- M12, 5-pin connection technology
- Display of the switching status per channel via LED
- Short circuit and overload detection
- Malfunction display by a red LED
- Module supports the CPI functionality (only in combination with the CPX CP interface)
- Circumferential labelling with large, hinged inscription label
- Earthing plate and H-rail mounting already integrated



General technical data		
Type		CP-A08-M12-EL-Z Positive switching
Number of outputs		8
Allocation of outputs		Connection 1, 3, 5 and 7 with double allocation, connection 2, 4, 6 and 8 with single allocation
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. residual 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 concerning 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		To ICE 1131-T2
Electrical isolation between channels		None
Connection to bus node		Via pre-assembled cables
Diagnostics		CP communication Short circuit/overload per channel Undervoltage
LED displays		3 module diagnostics 8 channel status 8 channel diagnostics

Materials		
Housing		Reinforced PA
Cover		Reinforced PA
Note on materials		RoHS-compliant

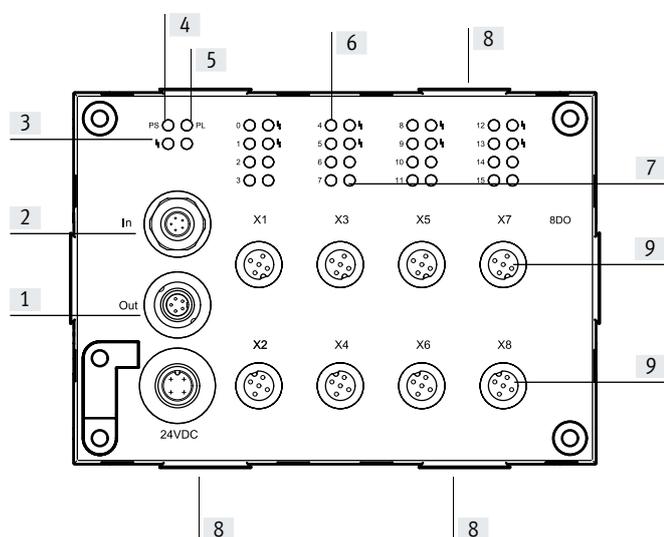
Data sheet – Output modules CP-A08-EL

Operating and environmental conditions		
Degree of protection to EN 60529		IP65/IP67 (when fully plugged in or fitted with protective cap)
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⁾
KC mark		KC EMC
Certification		c UL us listed (OL)
		C-Tick

- 1) Corrosion resistance class CRC 1 to Festo standard FN 940070
 Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).
- 2) For information about the area of use, see the EC declaration of conformity at: www.festo.com/sp → Certificates.
 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 display, yellow)
- [7] Status LED for output (channel) short circuit/overload (red)
- [8] Fixture for inscription label holder ASCF-H-E2
- [9] 8 outputs (1 output per socket)

Pin allocation for load voltage connection CP-A08-M12-EL-Z

Terminal allocation	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 earthing

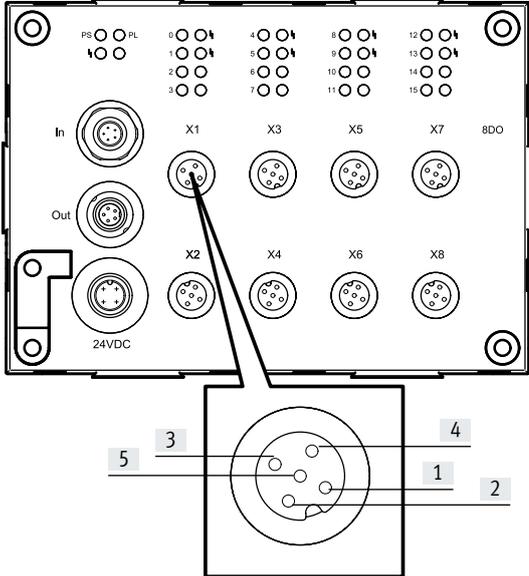
Data sheet – Output modules CP-A08-EL

Pin allocation for outputs

Terminal allocation

Output 1, 3, 5 and 7		Designation
Pin	Signal	

CP-A08-M12-EL-Z (odd number of PNP outputs)



1	n.c.	Not connected
2	Ox+1	Connected with pin 4 of output 2
3	0 V	Reference potential
4	Ox	Output
5	FE	Earth terminal

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.

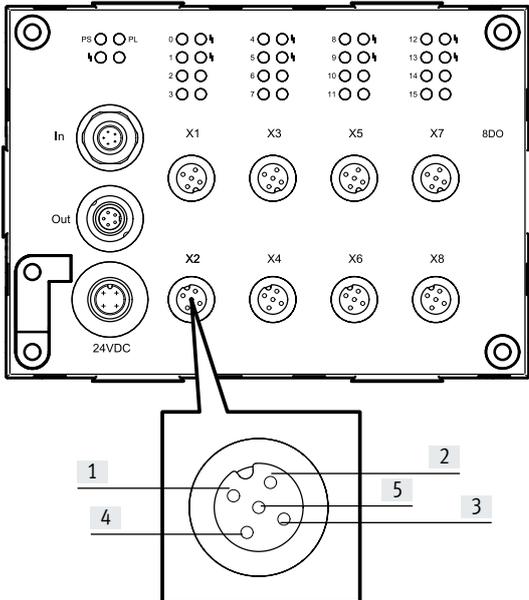
* Ox = Output x

Pin allocation for outputs

Terminal allocation

Output 2, 4, 6 and 8		Designation
Pin	Signal	

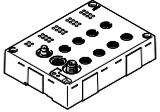
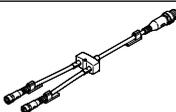
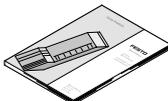
CP-A08-M12-EL-Z (even number of PNP outputs)



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		Part no.	Type
Designation			
Output module			
	Positive switching	546924	CP-A08-M12-EL-Z
Plug			
	Plug, straight socket, M12x1	5-pin	PG7
		4-pin	PG7
		4-pin	2.5 mm ² O.D.
	Plug for 2 connecting cables, M12x1, PG11	4-pin	18779
		5-pin	192010
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
		English	539300
		French	539302
		Italian	539303
		Spanish	539301
			P.BE.-CPEA-CL-DE
			P.BE.-CPEA-CL-EN
			P.BE.-CPEA-CL-FR
			P.BE.-CPEA-CL-IT
			P.BE.-CPEA-CL-ES

Data sheet – Output modules CP-A04

Function

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

Area of application

- Output module with 4 outputs 24 V DC
- M12 connection technology, with 5-pin sockets
- LED display of the switching status per channel
- Short circuit and overload detection
- Malfunction display by a red LED
- Module supports the CPI functionality (only in combination with the CPX CP interface)



Note

Optimum actuation of valves with M12 central plug.

General technical data

Type	CP-A04-M12-CL Positive switching
Number of outputs	4
Allocation of outputs	Connection 1 and 3 with double allocation, connection 2 and 4 with single allocation
Sensor connection type	4x M12, 5-pin
Power supply 24 V DC	From the bus node, basic unit, CP interface, etc.
Intrinsic current consumption of electronics [mA]	Typically 35
Max. output current per channel [A]	Max. 0.5, max. 2 outputs can be connected in parallel
Operating voltage [V DC]	24 ±25%
Fuse protection for power output	Internal electronic short-circuit protection per output
Switching logic	PNP
Output characteristic	To ICE 1131-2
Galvanic isolation	None
Connection to bus node	Via pre-assembled cables
Diagnostics	Undervoltage Short circuit at actuator output (per channel)
Dimensions (LxWxD) [mm]	151 x 30 x 25
Weight [g]	165

Data sheet – Output modules CP-A04

Operating and environmental conditions	
Degree of protection to EN 60529	IP65/IP67 (when fully plugged in or fitted with protective cap)
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 Explosion Protection Directive (ATEX)
Certification	c UL us listed (OL) C-Tick

1) Corrosion resistance class CRC 1 to Festo standard FN 940070

Low corrosion stress. Dry indoor application or transport and storage protection. Also applies to parts behind covers, in the non-visible interior area, and parts which are covered in the application (e.g. drive trunnions).

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

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 certifications	
ATEX category for gas	II 3G
Type of ignition protection for gas	Ex nA IIC T6 X Gc
ATEX category for dust	II 3D
Type of ignition protection for dust	Ex tc IIIC T70°C X Dc IP67
ATEX ambient temperature [°C]	-5 ≤ Ta ≤ +50

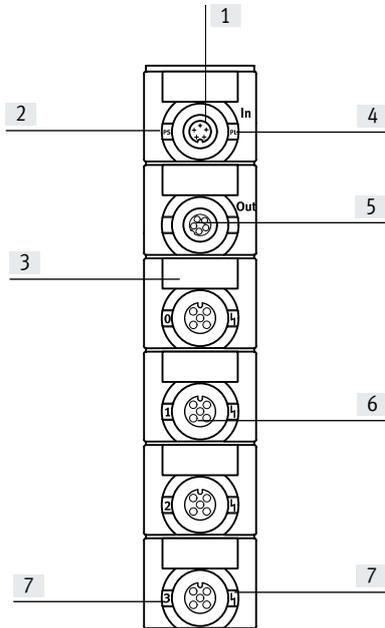
**Note**

When operating device combinations in potentially explosive areas, the lowest common zone, temperature class and ambient temperature of the individual devices determine the possible use of the entire module.

Data sheet – Output modules CP-A04

Connection and display components

CP-A04-M12-CL



- [1] CP connection, incoming
- [2] Status LED (green)
- [3] Holder for inscription label (IBS-8x20)
- [4] Red LED for short circuit/overload display
- [5] CP connection, outgoing
- [6] Output
- [7] Green LED for status indication (one LED per output)

Pin allocation for outputs

Terminal allocation	Output 1 and 3		Designation	Output 2 and 4	
	Pin	Signal		Pin	Signal

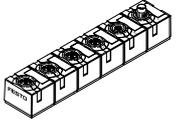
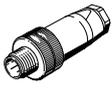
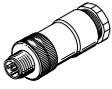
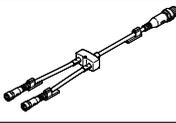
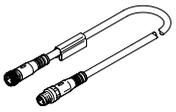
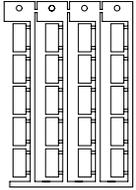
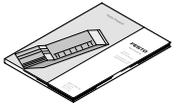
CP-A08-M12-5POL (PNP outputs)

	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	Ox	Output/connected with pin 2 of plug 1	4	Ox+1
	5	FE	Earth terminal	5	FE

Note
Two outputs can be connected to each of connections 1 and 3 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.

* Ox = Output x

Accessories – Output modules CP-A04

Ordering data – Accessories		Part no.	Type		
Designation					
Output module					
	Positive switching	538790	CP-A04-M12-CL		
Sensor plug					
	Plug, straight socket, M12x1	5-pin	PG7	175487	SEA-M12-5GS-PG7
		4-pin	PG7	18666	SEA-GS-7
		4-pin	2.5 mm ² O.D.	192008	SEA-4GS-7-2.5
	Plug for 2 connecting cables, M12x1, PG11	4-pin		18779	SEA-GS-11-DUO
		5-pin		192010	SEA-5GS-11-DUO
Distributors					
	Modular system for all types of sensor/actuator distributor	-	NEDY-... → Internet: nedy		
Connecting cable					
	Modular system for a choice of connecting cables	-	NEBU-... → Internet: nebu		
Inscription labels					
	Inscription labels 8x20 mm, in frame (20 pieces)	539388	IBS-8x20		
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	

Data sheet – 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

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 achieve 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 the latest after the third electronics module.

General technical data			MPA-CPI-VI
Type			MPA-CPI-VI
CP interface, incoming			Plug M9, 5-pin
CP interface, outgoing			Socket M9, 5-pin
Max. no. of valve positions			32
Max. number 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
Operating voltage range		[V DC]	24 ±25%
Mains 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
Dimensions			→ Internet: mpa-s
Weight		[g]	220
Technical data on valves			→ Internet: mpa-s
Degree of protection to EN 60529			IP65 (when fully plugged in or fitted with protective cover)

Data sheet – Valve terminals MPA-S

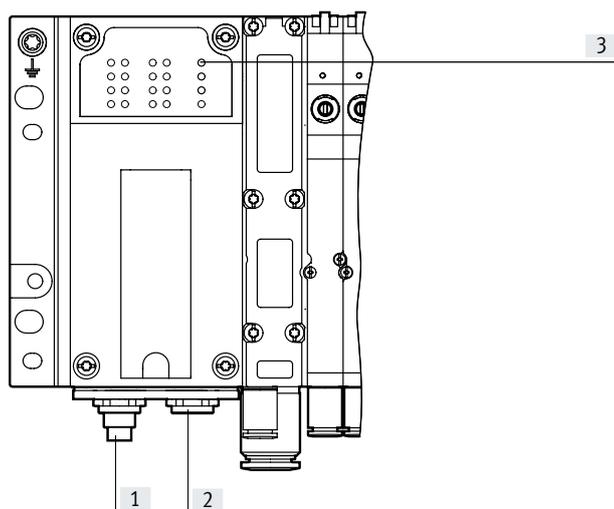
Operating and environmental conditions		
Operating medium		Compressed air to ISO 8573-1:2010 [7:4:4]
Note on the operating/pilot medium		Lubricated operation possible (in which case lubricated operation will always be required)
Operating pressure	[bar]	-0.9 ... +10
Ambient temperature	[°C]	-5 ... +50
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 Explosion Protection Directive (ATEX)
KC mark		KC EMC
Certification		c UL us - Recognized (OL)
		RCM compliance mark

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

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.

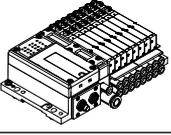
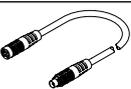
ATEX		
ATEX category for gas		II 3 G
Type of ignition protection for gas		Ex nA IIC T4 X Gc
Explosion-proof ambient temperature	[°C]	-5 ≤ Ta ≤ +50

Connection and display components



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

Data sheet – Valve terminals MPA-S

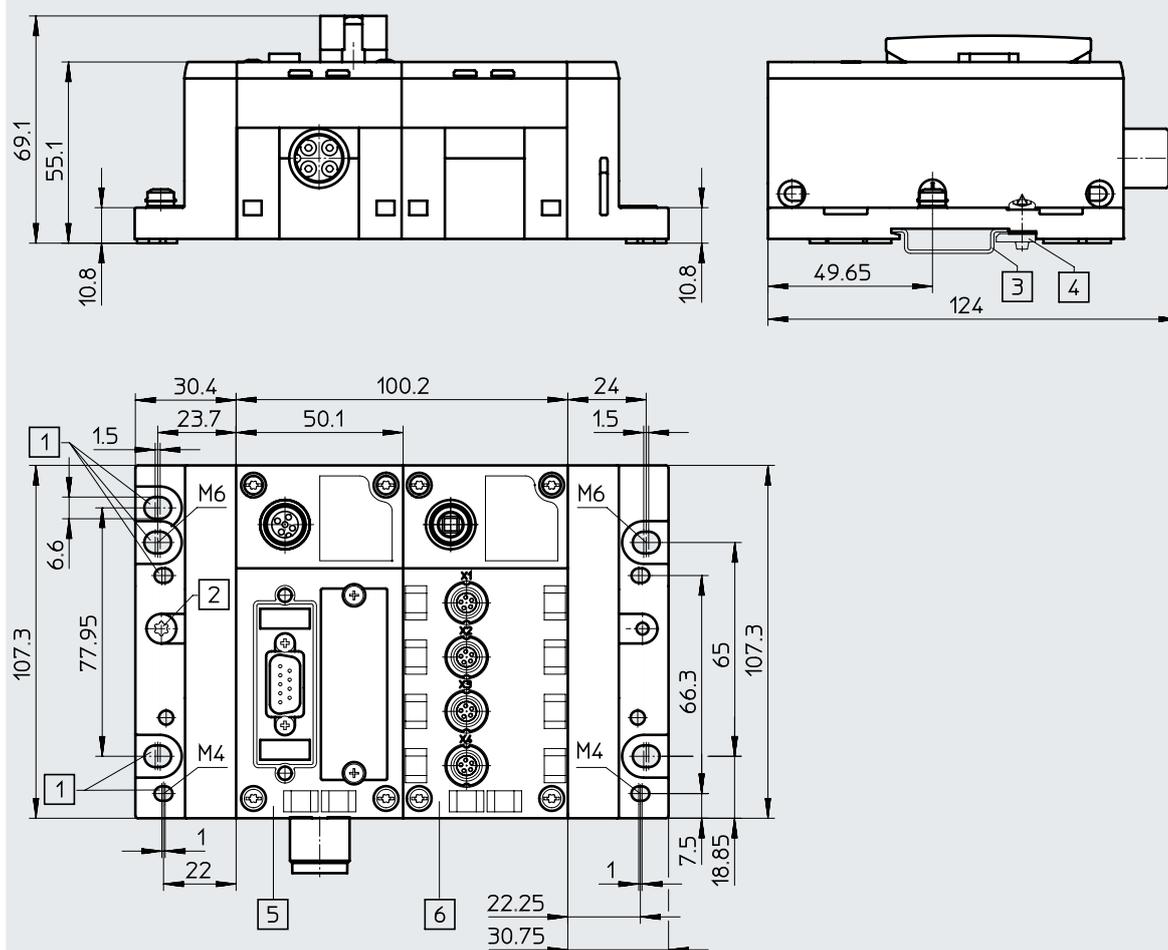
Ordering data – Accessories		Part no.	Type
MPA-S valve terminal			
	With CPI interface	546280	MPA-CPI-VI
Valve terminal connection			
	Connecting cable WS-WD	0.25 m	540327 KVI-CP-3-WS-WD-0.25
		0.5 m	540328 KVI-CP-3-WS-WD-0.5
		2 m	540329 KVI-CP-3-WS-WD-2
		5 m	540330 KVI-CP-3-WS-WD-5
	Connecting cable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



[1] Mounting holes
[2] Earthing screw

[3] H-rail
[4] H-rail mounting

[5] CPX bus node

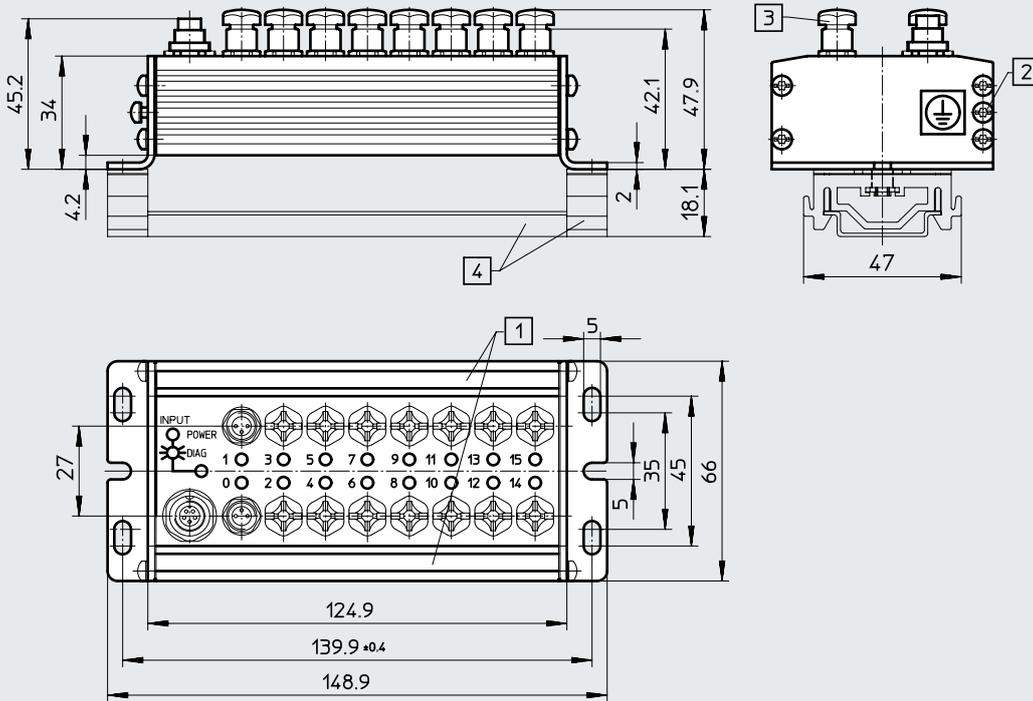
[6] CPX-CP interface

Technical data

Dimensions – Sturdy input modules

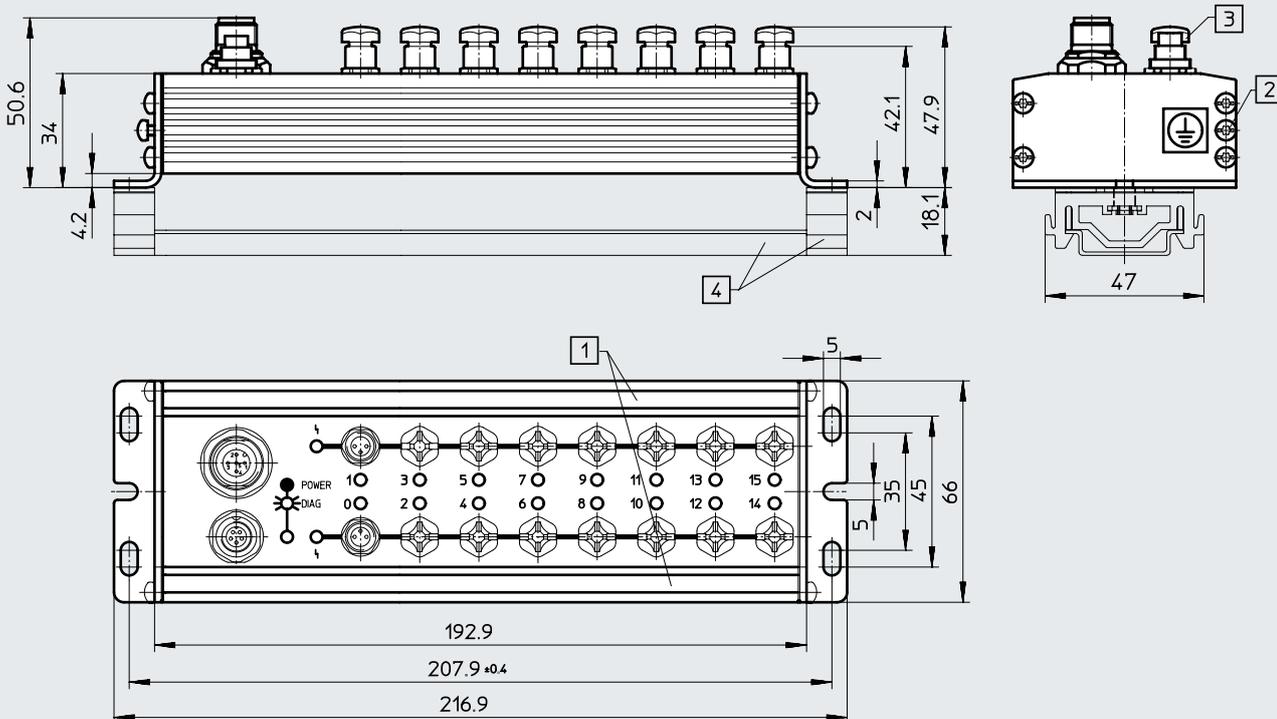
Download CAD data → www.festo.com

CP-E16-M8



- [1] Slots for inscription labels
- [2] Earthing screw M3
- [3] Protective caps (included in the scope of delivery)
- [4] H-rail with support base

CP-E16-M8-Z



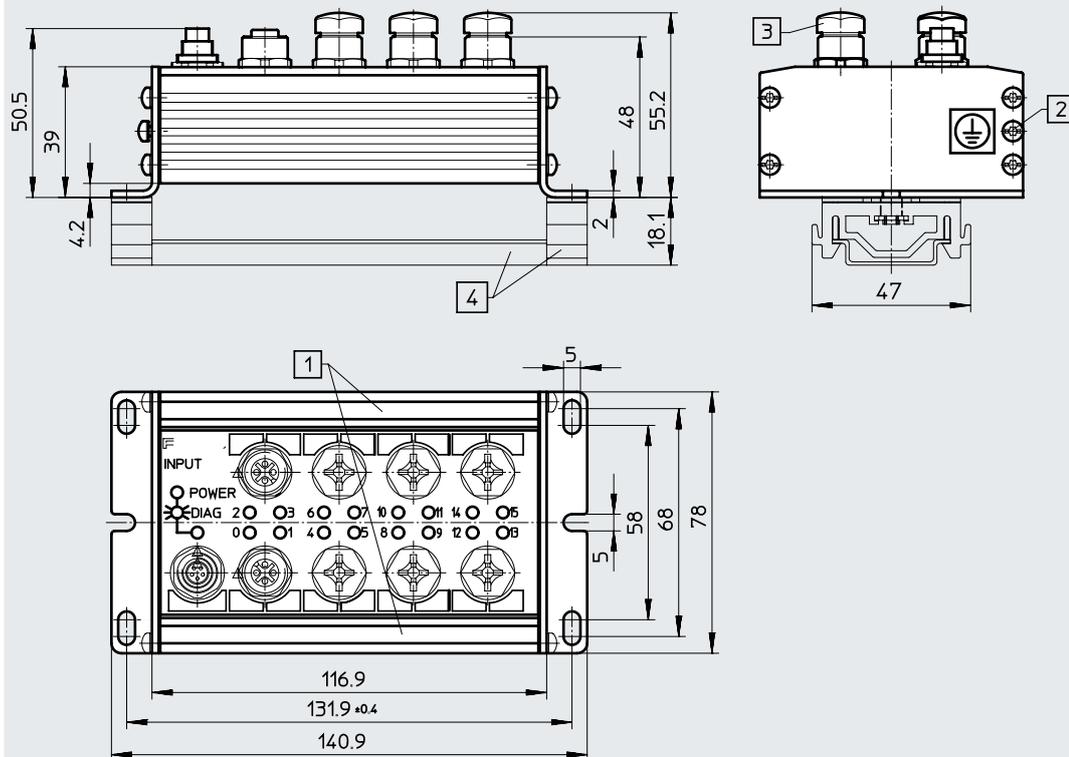
- [1] Slots for inscription labels
- [2] Earthing screw M3
- [3] Protective caps (included in the scope of delivery)
- [4] H-rail with support base

Technical data

Dimensions – Sturdy input modules

Download CAD data → www.festo.com

CP-E16-M12x2-5POL



[1] Slots for inscription labels

[2] Earthing screw M3

[3] Protective caps (included in the scope of delivery)

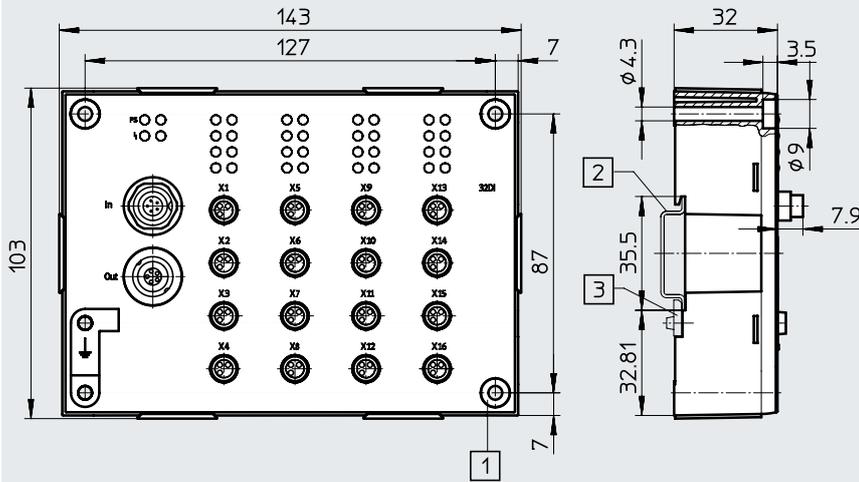
[4] H-rail with support base

Technical data

Dimensions – Economical input modules

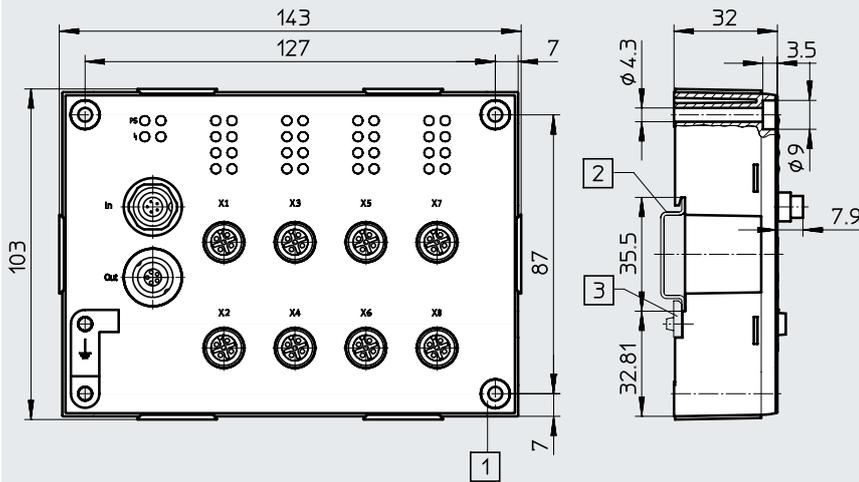
Download CAD data → www.festo.com

CP-E16-M8-EL



- [1] Through-hole for surface mounting
- [2] H-rail
- [3] Mounting kit for H-rail (included in the scope of delivery)

CP-E16-M12-EL



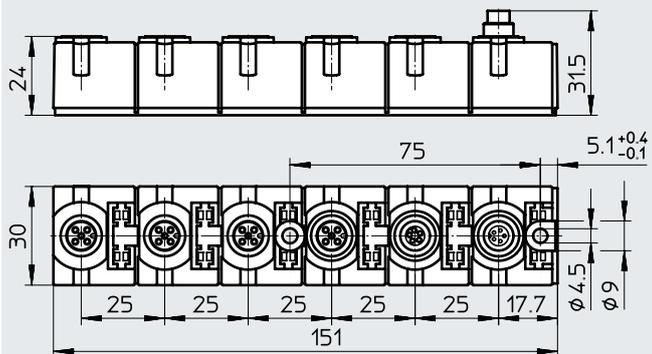
- [1] Through-hole for surface mounting
- [2] H-rail
- [3] Mounting kit for H-rail (included in the scope of delivery)

Technical data

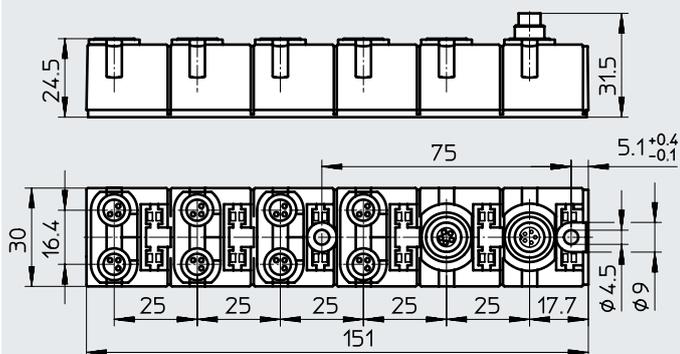
Dimensions – Compact CP modules

Download CAD data → www.festo.com

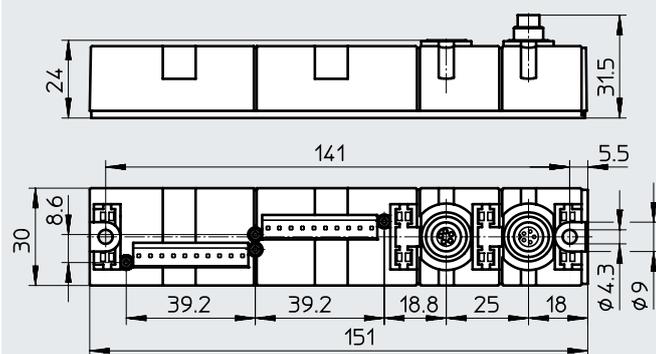
CP-E08-M12-CL/CP-A04-M12-CL



CP-E08-M8-CL



CP-E16-KL-CL



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 modules with CPI functionality

CP modules with CPI functionality offer the following features:

- Incoming and outgoing CP interface
- Any arrangement of the 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

CP masters and CP modules can be split into two different groups:

- 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 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

Information on using 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 with lengths of 0.25 m, 0.5 m, 2 m, 5 m and 8 m

→ p. 64

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).

Order processing

The electrical CPI installation system can be ordered as follows:

- Digitally using the valve terminal configurator.

Please note that the CP strings must be allocated in ascending numerical order, i.e. starting with string 1, followed by string 2, etc. without omitting any numbers.

To correctly allocate a CP string, proceed as follows:

- First select a connecting cable of appropriate length.
- Then select an input/output module.
- Continue in this way until the string is fully allocated (max. 4 strings for CP modules with extended functionality).

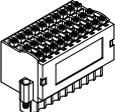
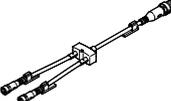
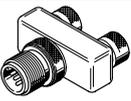
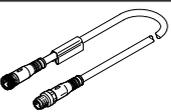
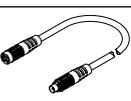
The valve terminals are configured separately:

- Valve terminal CPV
CPV10/14/18-VI-FB-....
- → Internet: cpv
- Valve terminals MPA-S
MPA-S-CPI-VI
- → Internet: mpa-s

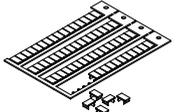
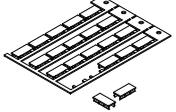
The configuration of the valve terminals with I-Port interface is carried out separately in two stages:

- Selection of the CPI interface
- → Internet: cteu
- Selection of the valve terminal:
- → Internet: vtoc
- → Internet: vtub-12
- → Internet: cpv
- → Internet: mpal
- → Internet: vtug

Accessories

Ordering data				Part no.	Type		
Designation							
Connection sets for power supply and sensors							
	Plug, screw-in tension-spring socket	3-row, 30-pin	With LED	197162	PS1-SAC31-30POL+LED		
Sensor plug							
	Plug M8, 3-pin	Solderable	For NEDY-L2R1-V1-M8G3-N-M8G4	18696	SEA-GS-M8		
		Screw-in	For NEDY-L2R1-V1-M8G3-N-M8G4	192009	SEA-3GS-M8-S		
	Plug M12, 4-pin	Screw terminal	For cable ø 2.5 ... 2.9 mm	192008	SEA-4GS-7-2.5		
			For 2x cable ø 3 ... 5 mm	18779	SEA-GS-11-DUO		
			For cable ø 4 ... 6 mm	18666	SEA-GS-7		
Plug M12, 5-pin	Screw terminal	For 2x cable ø 2.5 ... 5 mm	192010	SEA-5GS-11-DUO			
		For cable ø 4 ... 6 mm	175487	SEA-M12-5GS-PG7			
Distributors							
	Modular system for all types of sensor/actuator distributor			-	NEDY-... → Internet: nedy		
	Push-in T-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							
	Connecting cable M8-M8	3-pin	Straight plug/straight socket	0.5 m	541346	NEBU-M8G3-K-0.5-M8G3	
				1.0 m	541347	NEBU-M8G3-K-1-M8G3	
				2.5 m	541348	NEBU-M8G3-K-2.5-M8G3	
				5.0 m	541349	NEBU-M8G3-K-5-M8G3	
				Connecting cable M12-M12			5-pin
			3.5 m	530901	KV-M12-M12-3.5		
Modular system for a choice of connecting cables				-	NEBU-... → Internet: nebu		
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 caps			
	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 H-rail, CP modules	170169	CP-TS-HS35
Inscription labels			
	Inscription labels 6x10 mm, in frame (64 pieces)	18576	IBS-6x10
	Inscription labels 8x20 mm in frames (20 pieces) for compact modules (CP-...-CL)	539388	IBS-8x20
	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 sturdy input/output modules	German	165125 P.BE.-CPEA-DE
		English	165225 P.BE.-CPEA-EN
		French	165127 P.BE.-CPEA-FR
		Italian	165157 P.BE.-CPEA-IT
		Spanish	165227 P.BE.-CPEA-ES
	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	