# CPI installation system

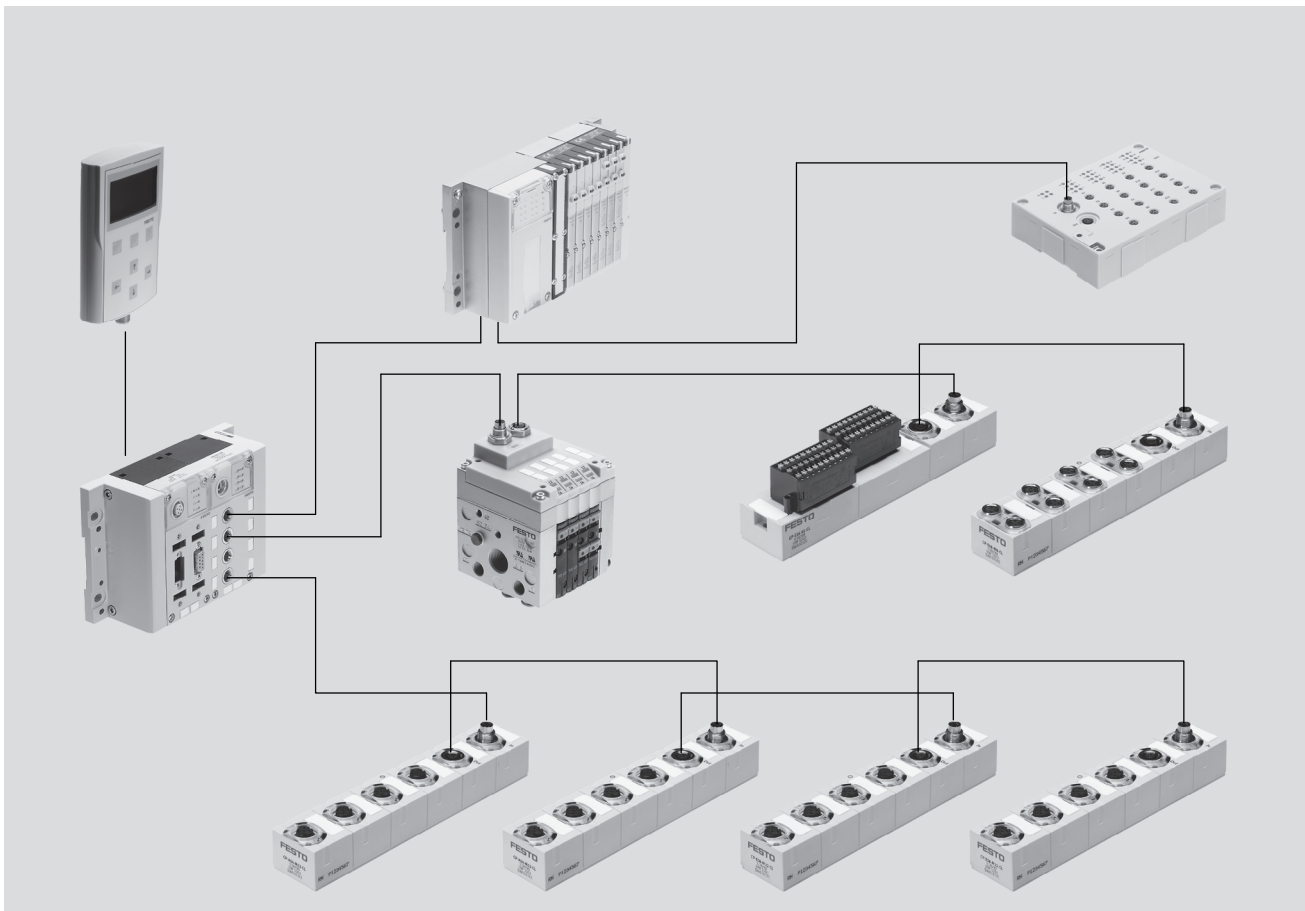**FESTO**

## Key features

### Innovative

- Complete concept for decentralised machine and system structure; centralised and decentralised installation can be combined with the CPX terminal
- Decentralised pneumatics and sensors for fast processes
- Centralised electrics for fieldbus and common power supply
- Flexible configuration of the individual CP strings
- Selectable valve terminal sizes for optimum pneumatic control loop systems
- Performance data as for the CP system with the addition of the comprehensive diagnostic capabilities of the CPX terminal

### Sturdy

- Electrical accessories to IP65
- Proven valve terminals CPV (compact) and 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 spring-loaded terminals or screw terminals

### Versatile

- A number of CP interfaces can be combined under one fieldbus 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, flow rate max. 700 l/min
  – Valve terminal CPV, flow rate max. 1600 l/min
  – 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
- Intelligent system (save button) "learns" current configuration
- Easy replacement of modules at any time

# CPI installation system

Key features

## CPI installation system

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

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

The system integrates the modular valve terminals CPV 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. Four modules, for example one CPV valve terminal and one to three CP input modules, make up an installation string that ends at the CP interface.

**Scope of features:**
- Max. 4 installation strings per CP interface
- Max. 10 metre 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.
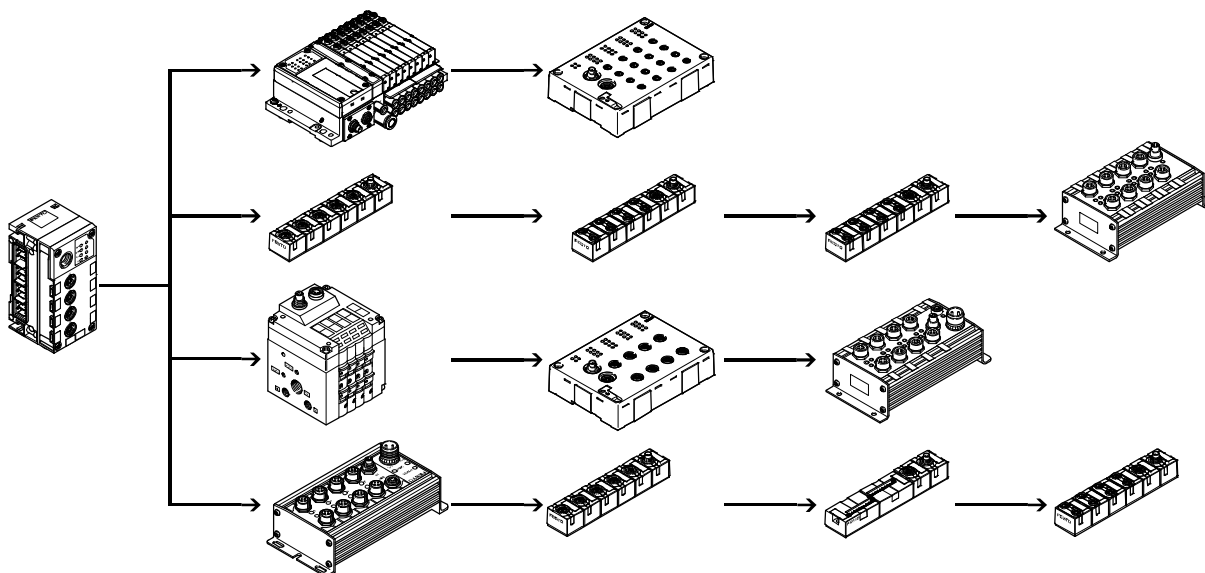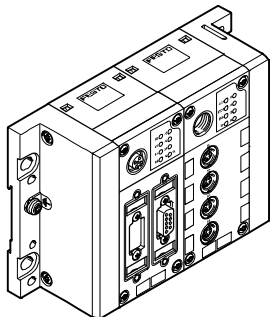
# CPI installation system

Key features

## Node types
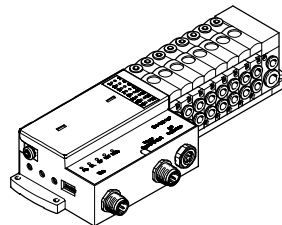
| Fieldbus | Valve terminal |
|---|---|



CPX with CP interface
CPX-…



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

## Configurator

Selecting a CPI system using the online catalogue is quick and easy thanks to the convenient configurator provided. This makes it much easier to find the right product.

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

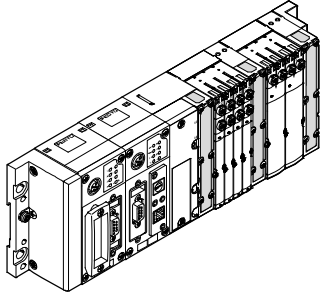Ordering system for type 55E
→ Internet:ctec

**Integration of the CPI installation system 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)
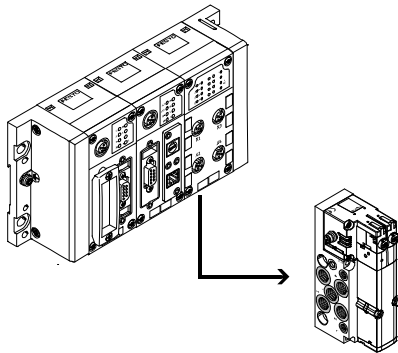


**Advantages**

- 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 interlinking not advisable/possible
- More complex electrical installation

Centralised electrical connection (multi-pin plug/bus connection/standalone minicontroller)
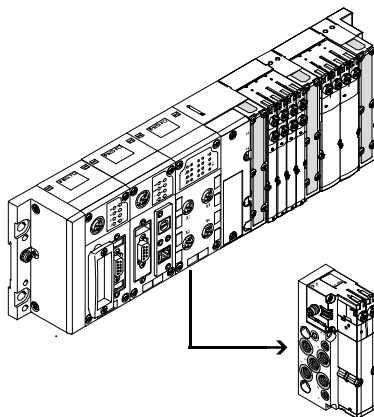


**Advantages**

- Internal electrical interlinking 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
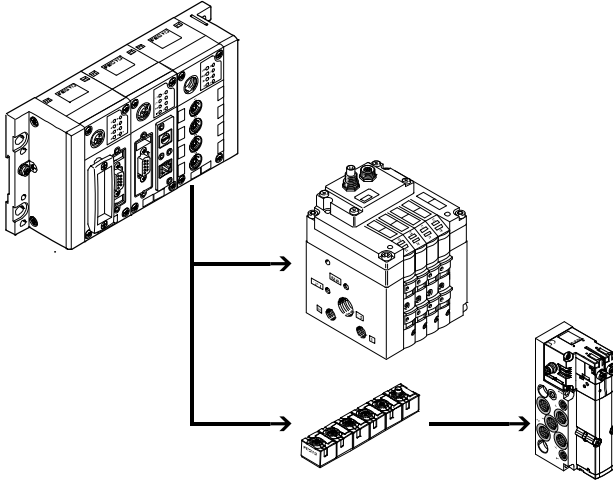- More complex individual components (cables, fieldbus modules)

**Integration of the CPI installation system in various connection concepts**

Decentralised electrical connection (CPI system/individual valve/valve on individual sub-base/valve manifold)
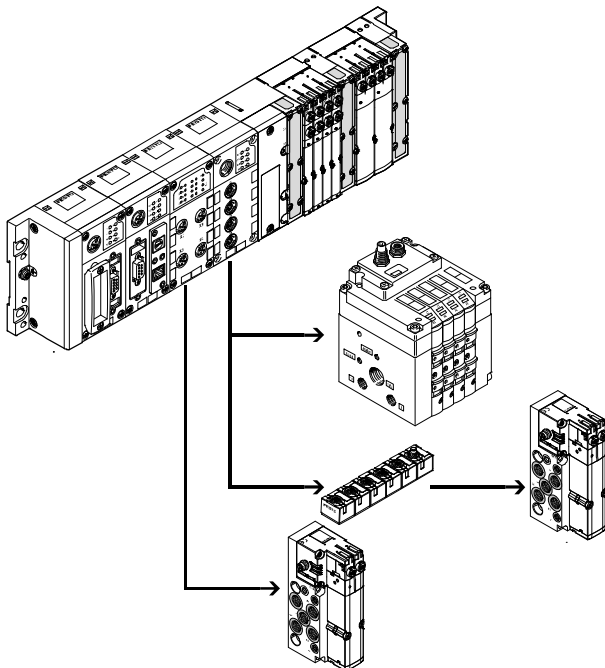
**Advantages**
- CPI system with reduced installation complexity for groups of actuators/sensors
- Different levels of complexity with widely separated individual components
- Easy replacement of components during servicing
- Optimum pneumatic timing and performance possible

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

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

**Advantages**
- Can be scaled 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

**Connection of 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 enables simultaneous access via Ethernet and an integrated web server, as well as autonomous pre-processing.

- Ethernet
- TCP/IP
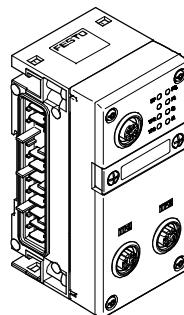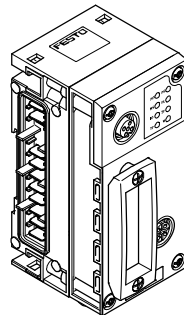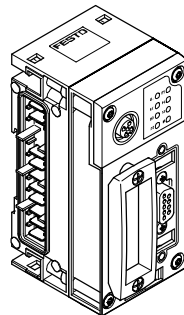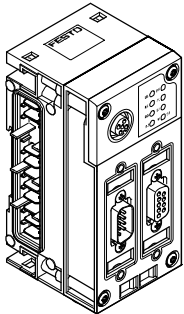- Web

# CPI installation system

Peripherals overview

## Connection of the CPI installation system to a higher-level controller

| Overview | Bus protocol/bus node | Special features |
|---|---|---|
| CPX bus node/control block | **INTERBUS** | |
| | FB6 | • Up to 96 digital inputs/outputs |
| | FB21 | • 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 |
| CPX CP-Interface | **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 | • Up to 512 digital inputs/outputs |
| | FB34 | • 32 analogue inputs/outputs |
| | FB35 | |
| | FB41 | |
| | **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 |

Technical data CPX
→ Internet: cpx

**Connection of modules in the CPI installation system**
CP interface within the context of the CPX terminal

Using the CP interface as a module of the CPX terminal facilitates the progression 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 possibilities 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

# CPI installation system

Connection options

## Fieldbus Direct

### Special feature

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.

### Application

Fieldbus Direct is a system for the compact connection of a valve terminal to different bus standards. The most important bus protocols including PROFIBUS, INTERBUS, DeviceNet and CANopen are supported. The CP string extension option allows the functions and components of the CPI installation system to be used.

### Characteristics of Fieldbus Direct

- Extremely compact and space-saving design
- Low-cost solution for the connection of a small number of valves to the fieldbus
- Direct front-end integration with a high degree of protection (IP65)
- Comprehensive diagnostics and condition monitoring

- Note

The range of functions and combination options of CPV, CPV-SC and MPA-S valves are described in detail in

➜ Internet: cpv
  (Valve terminal CPV)
➜ Internet: cpv-sc
  (Valve terminal CPV-SC)
➜ Internet: mpa-s
  (Valve terminal MPA-S)

## Fieldbus Direct and CP string extension

The optional string extension allows a further valve terminal and I/O modules to be connected to the Fieldbus Direct bus node.

- A CP string of the CP system is integrated in the bus node as an extension
- Different input and output modules as well as CPV and MPA-S valve terminals can be connected

The maximum length of the CP string extension is 10 metres, which means that the extension modules can be mounted directly on-site. All of the required electrical signals including load current supply are transmitted via the CP cable, which in turn means that no further installation is needed on the expansion module.

The CP string interface offers:
- Max. 32 input signals
- Max. 32 output signals for output modules 24 V DC or solenoid coils
- Logic and sensor supply for the input modules

- Load voltage supply for the valve terminals
- Logic supply for the output modules

**Fieldbus Direct with CP string extension**

CPV valve terminal
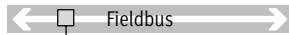
Fieldbus

- 4 to 8 valve positions
- DeviceNet
- CANopen
- PROFIBUS DP
- ABB CS31
- INTERBUS
- Moeller Suconet

- Festo fieldbus
- Beckhoff
- CC-Link
- 4 to 16 solenoid coils

Further information
➔ Internet: cpv

CPV-SC

Fieldbus
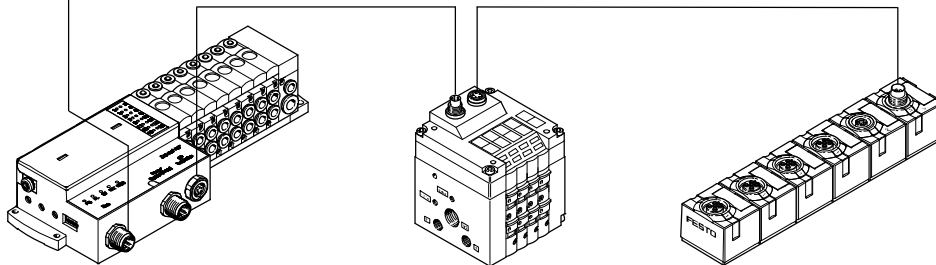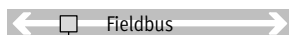
- 4 to 16 valve positions
- DeviceNet connection
- PROFIBUS DP
- 4 to 16 solenoid coils

Further information
➔ Internet: cpv-sc

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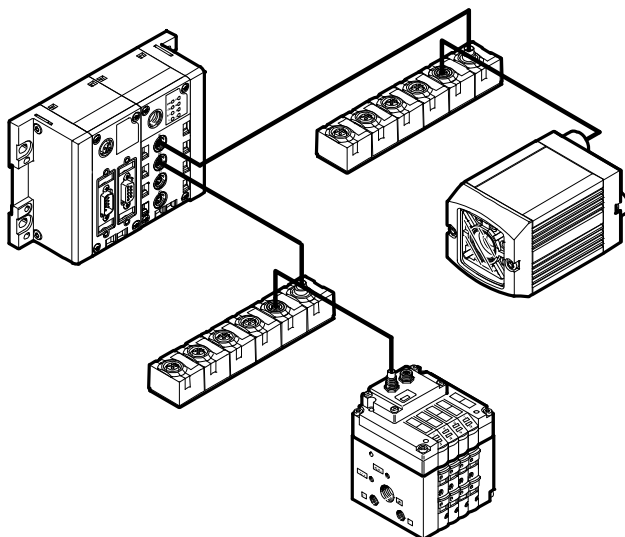
The compact vision system SBOx-Q can be integrated into a Festo CPI network. In this case it functions like a binary module with 16 inputs and outputs.

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

Further information
➔ Internet: sboc-q, sboi-q

# CPI installation system

Connection options

## Connection of input and output modules in the CPI installation system
### CP connecting cable

KVI-CP-3-...

- ⬚ - Note

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

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

Further information
→ Internet: kvi-cp

### CP input/output modules in sturdy, universal and compact design or as a valve terminal

Input and output modules with different electrical interfaces are available for connecting sensors and actuators:
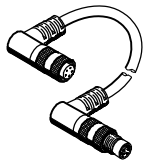
- M12-5PIN
- M8-3PIN
- M8-4PIN
- Spring-loaded terminal or screw terminal technology

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
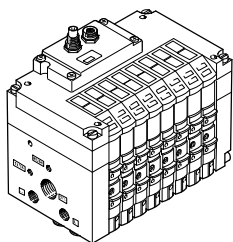
CPV10
CPV14
CPV18

- 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

Further information
→ Internet: cpv
   (Valve terminal CPV)

### MPA-S valve terminal
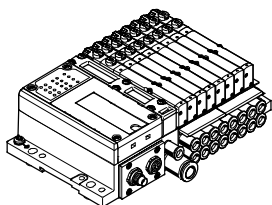
MPA1
MPA14
MPA2

- 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

Further information
→ Internet: mpa-s
   (Valve terminal MPA-S)

### Valve terminal with I-Port interface
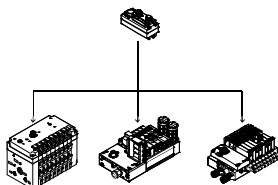
Valve terminals:
- VTOC
- VTUB-12
- CPV
- MPA-L
- VTUG

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

Further information
→ Internet: vtoc
→ Internet: vtub-12
→ Internet: cpv
→ Internet: mpal
→ Internet: vtug
→ Internet: cteu

## Connection of input and output modules in the CPI installation system

Special features of the CP input/output modules of sturdy design

The sturdy CP input/output modules have a highly resistant aluminium housing and its internal electronic components can be repaired or replaced.

As a CP-E...Z or 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 facilitates separate disconnection of the consuming devices.

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 of sturdy design
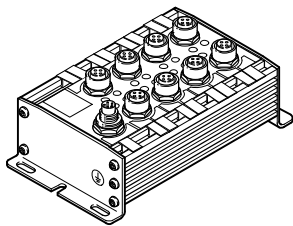
| | CP-E16-M12x2-5POL | • 16 inputs 24 V DC<br>• Signal status display via 16 LEDs<br>• Operating status display<br>• CP functionality | • M12 plug, double allocation<br>• 1x M9 CP connection<br>• PNP/NPN, IP65 |

| | CP-E16-M8 | • 16 inputs 24 V DC<br>• Signal status display via 16 LEDs<br>• Operating status display<br>• CP functionality | • M8 plug, single allocation<br>• 1x M9 CP connection<br>• PNP/NPN, IP65 |

| | CP-E16-M8-Z | • 16 inputs 24 V DC<br>• Signal status display via 16 LEDs<br>• Operating status display<br>• CP functionality | • Galvanic isolation through additional power supply<br>• M8 plug, single allocation<br>• 1x M9 CP connection<br>• Separate sensor supply<br>• PNP/NPN, IP65 |

### CP output modules of sturdy design
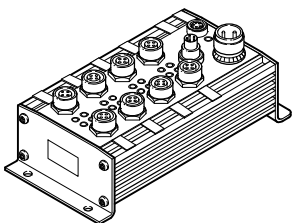
| | CP-A08-M12-5POL | • 8 outputs 24 V DC<br>• Output signal display via 8 LEDs<br>• Operating status display<br>• M12 plug, single allocation<br>• CP functionality | • 2x M9 CP connection<br>• Separate load voltage<br>• Outputs resistant to overloads and short circuits<br>• PNP, IP65 |

## Connection of input and output modules in the CPI installation system

Special features of the CP input/output modules of economical design

In addition to the sturdy CP input/output modules and the compact CP input/output 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 connection 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

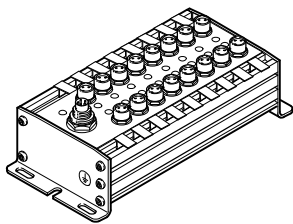### CP input modules of economical design
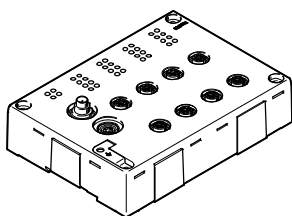


CP-E16-M12-EL

• 16 inputs 24 V DC
• Signal status display via 16 LEDs
• Operating status display (per module and per group of four inputs)
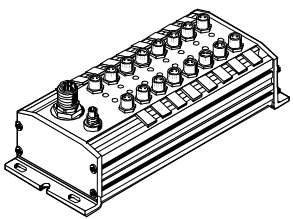• CPI functionality

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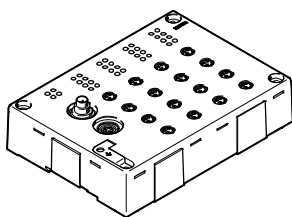


CP-E16-M8-EL

• 16 inputs 24 V DC
• Signal status display via 16 LEDs
• Operating status display (per module and per group of four inputs)
• CPI functionality

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

### CP output modules of economical design
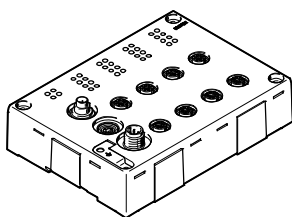


CP-A08-M12-EL-Z

• 8 outputs 24 V DC
• Signal status display via 4 LEDs
• Operating status display (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

# CPI installation system

Key features – Input/output modules

## Connection of input and output modules in the CPI installation system

Special features of the CP input/output modules of compact design

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

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 connection with the following valve terminals:
• CPV, MPA-S, CPV-SC

**Application:**
• The modules can be positioned 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 of compact design
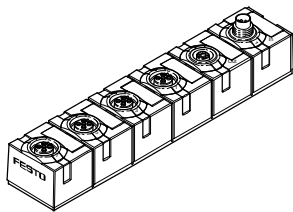
| | CP-E08-M12x2-CL | • 8 inputs 24 V DC<br>• Signal status display via 8 LEDs<br>• Operating status display<br>• CPI functionality | • 4x M12 plug, 5-pin, double allocation<br>• 2x M9 CP connection<br>• PNP, IP65/67 |
|---|---|---|---|
| | CP-E08-M8-CL | • 8 inputs 24 V DC<br>• Signal status display via 8 LEDs<br>• Operating status display<br>• CPI functionality | • 8x M8 plug, 3-pin, single allocation<br>• 2x M9 CP connection<br>• PNP, IP65/67 |
| | CP-E16-KL-CL | • 16 inputs 24 V DC<br>• Indirect signal status display via LEDs in the connection set of the tension-spring socket<br>• Operating status display<br>• CPI functionality | • Screw terminal or tension-spring sockets<br>• 2x M9 CP connection<br>• PNP, IP20 |

### CP output modules of compact design
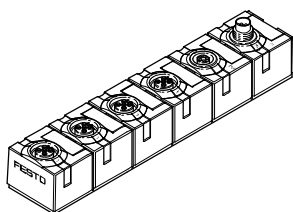
| | CP-A04-M12x2-CL | • 4 outputs 24 V DC<br>• Signal status display via 4 LEDs<br>• Operating status display<br>• CPI functionality | • 4x M12 plug, 5-pin, double allocation<br>• 2x M9 CP connection<br>• Outputs resistant to overloads and short circuits<br>• PNP, IP65/67 |
|---|---|---|---|

➔ **Internet: www.festo.com/catalog/...**

## H-rail mounting
### CP interface
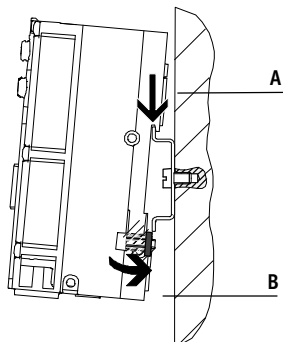


The H-rail mounting is formed in the reverse profile of the CPX interlinking blocks. The CPX terminal can be attached to the H-rail using the H-rail mounting.

The CPX terminal is attached to the H-rail as follows (see arrow A).
It is first swivelled on the H-rail and then secured in place with the clamping component (see arrow B).

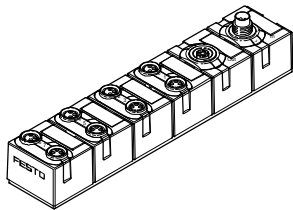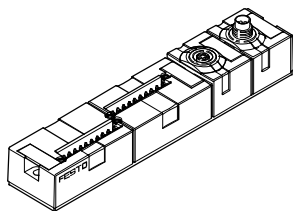The following mounting kit is required for H-rail mounting (plus mounting kit for optionally mounted valves):
• CPX-CPA-BG-NRH
This enables mounting on H-rails to EN 60715.

### Economical CP modules
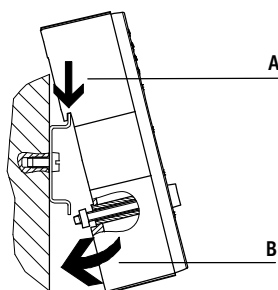


The H-rail mounting is impressed in the reverse profile of the economical CP modules. The modules can be attached to the H-rail using the H-rail mounting.

The module is attached to the H-rail as follows (see arrow A).
It is first swivelled on the H-rail and then secured in place with the clamping component (see arrow B).

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
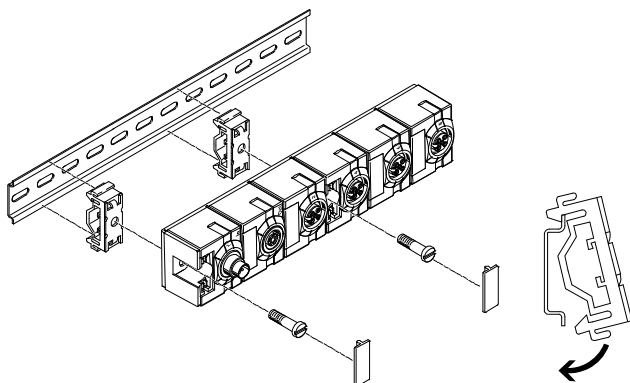


For the CP modules there is a mounting kit that can be used on an H-rail. On the compact CP modules, the mounting holes are covered by inscription labels.

The following mounting kit is required for H-rail mounting:
• CP-TS-HS35
This enables mounting on H-rails to EN 60715.

# CPI installation system

Key features – Mounting options

FESTO

**Wall mounting**

CP modules
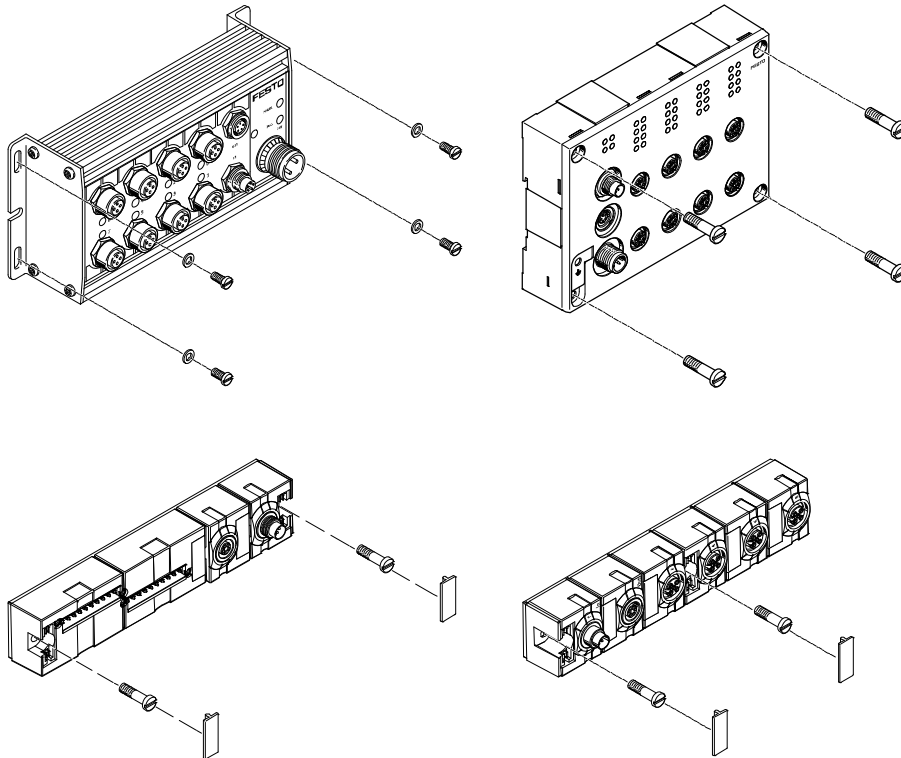


The CP modules (with screws up to 4 mm in diameter) can be mounted on even surfaces in almost any position using the mounting holes.

-  -  Note

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

➔ **Internet: www.festo.com/catalog/...**

Subject to change – 2019/05

| Inscription system |
|---|

All CP modules have holders for inscription labels.

Inscription labels/holders are not included in the scope of delivery and can be ordered separately.

The labels can be pre-assembled on request.

| Robust CP modules |
|---|
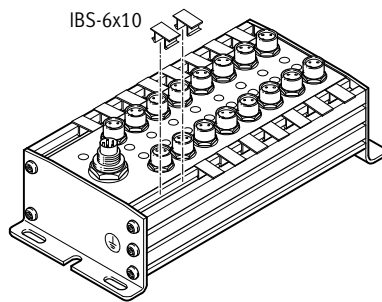
IBS-6x10

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 |
|---|
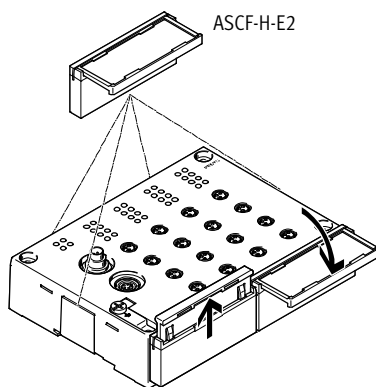
ASCF-H-E2

The economical CP modules have six lateral fixtures for one inscription label holder ASCF-H-E2 each (Part No. 547473).

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

| Compact CP modules |
|---|
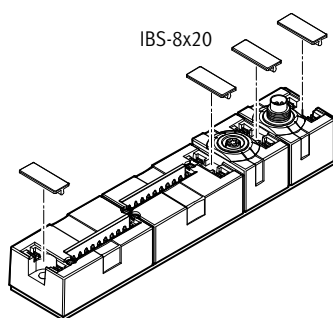
IBS-8x20

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.

## 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 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
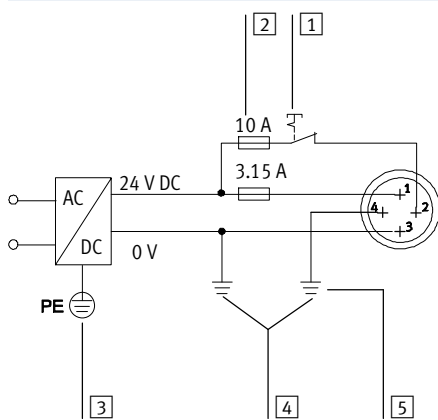


1 Load voltage supply (can be disconnected separately)
2 External fuses
3 Protective earth
4 Equipotential bonding
5 Earth terminal on pin 4, rated for 12 A

## Pin allocation of plug for additional power supply

| Pin 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 |

## Power supply concept of the CPX terminal

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



System supply
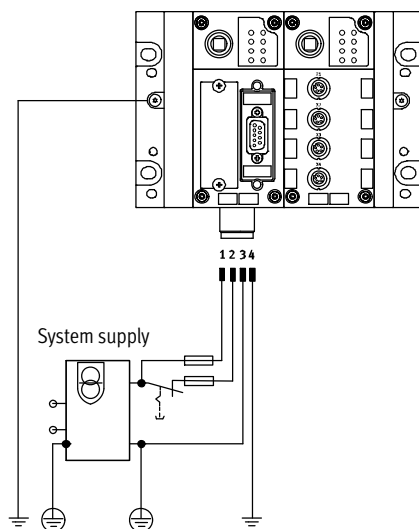
The use of decentralised devices on the fieldbus – particularly with high protection for direct machine mounting – demands a flexible power supply concept.

The CPX terminal facilitates the connection of all voltages via one connection.

A distinction is made between supply for
- electronics and sensors/inputs
- valves
- actuators/outputs

Selectable connecting thread:
- 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 earthed conductor.

### Interlinking blocks

Many applications require segmenting of the voltage into zones. This is true in particular of 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 supply for electrical outputs
- With additional power 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.

# CPI installation system

## 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

The CP interface supplies the connected CP modules with

- max. 1.6 A per CP string

## Diagnostics

### General information

A comprehensive diagnostic function is available for each string.

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

### Diagnostics via LED

- Error in bus communication
- POWER, power supply display for internal electronics
- POWER V, load voltage display 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 LED |
| 3 | String diagnostics via LED on the CP interface |
| 4 | Diagnostics via CP string |
| 5 | Diagnostics via LED on CP module |
| 6 | Status display on the CP module |

# CPI installation system

Key features – CP interface

Diagnostics via CP bus node



| | |
|---|---|
| 1 | Diagnostics via fieldbus |
| 2 | Bus-specific LED |
| 3 | String diagnostics via LED on the bus node |
| 4 | Diagnostics via LED on the CP module |
| 5 | Diagnostics via CP string |
| 6 | Status display on the CP module |
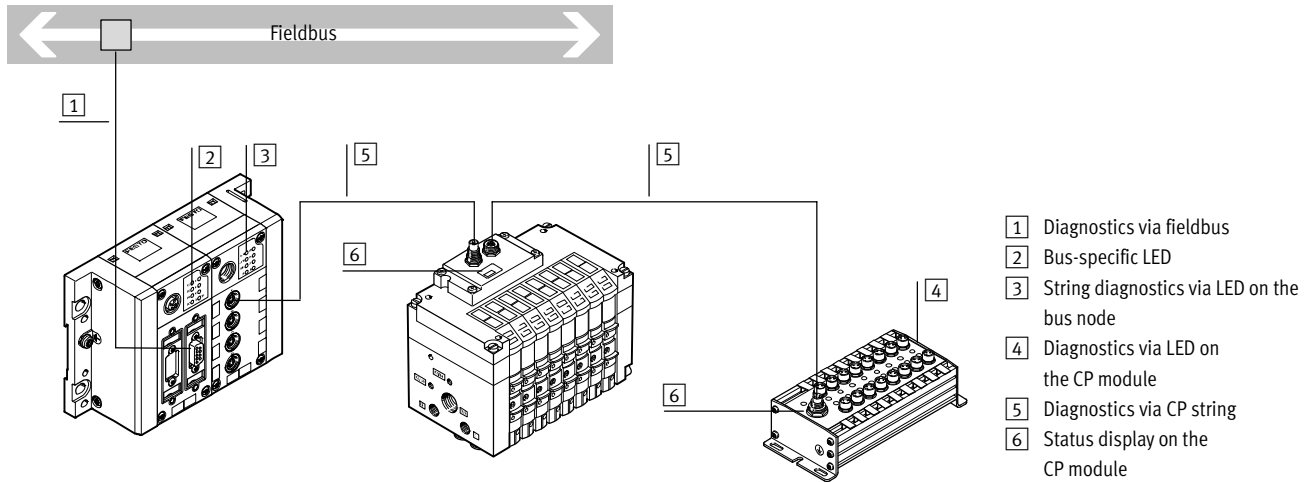
Diagnostic LEDs on the CP modules
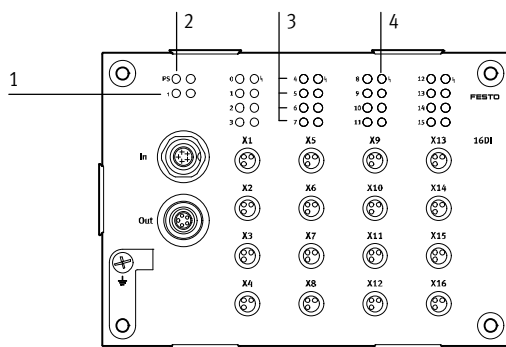


1 Status LED for
CP communication
(PS, green)

2 Status LED (module) for short cir-
cuit/overload of sensor supply
(red)

3 Status LEDs for inputs (status
display, green)

4 Status LED (group, only with
CP-E16-…-EL) for short circuit/
overload of sensor supply (red)

In addition to the status display per module and per individual channel/input, the economical modules with 16 inputs additionally have a status display for a group of four inputs. The following inputs are combined into groups of four:
- 0 … 3
- 4 … 7
- 8 … 11
- 12 … 15

## Parameterisation

Allocation of the addresses to the individual actuators/outputs or sensors/inputs connected to the CP modules is performed 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 inputs and 128 output addresses.
- A used string occupies 32 inputs 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.
The option is provided of replacing 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.

| **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<br>0 … 1 output module | 0 … 1 input module<br>0 … 1 output module | 0 … 10 |
| CPI system | 4 | 32/32 | 0 … 1 input module<br>0 … 1 output module | 0 … 4 input modules<br>0 … 4 output modules | 0 … 10 |

| **Module selection aid** | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Functionality | | Additional power supply | Address requirement | | Max. current consumption | ➔ Page/Internet |
| | CP | CPI | | Inputs | Outputs | [A] | |
| **Input modules** | | | | | | | |
| CP-E16-M8 | ■ | – | – | 16 | – | 0.54 | 26 |
| CP-E16-M12x2-5POL | ■ | – | – | 16 | – | 0.59 | 26 |
| CP-E16-M8-Z | ■ | – | ■ | 16 | – | 1.04 | 26 |
| 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 | 44 |
| CP-A08-M12-EL-Z | ■ | ■ | ■ | – | 8 | 4 | 51 |
| CP-A04-M12-CL | ■ | ■ | – | – | 4 | 1.035 | 55 |
| | | | | | | | |
| **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 | 59 |

**Accessory selection aid**

Connection M8, 3-pin
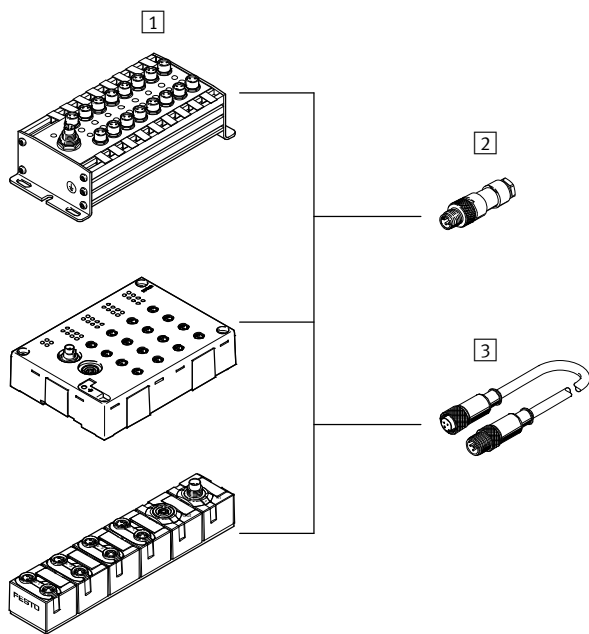


Note

Festo delivers pre-assembled M8/M12 connecting cables (NEBU modular system) on request:
- Tailored to the application
- Perfect fit
- Easy to install

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

| Plug connector/connecting cable | |
| --- | --- |
| Type | Connection technology |
| 2    Plug connector | |
| SEA-GS-M8 | Solder lug |
| SEA-3GS-M8-S | Screw terminal |
| | |
| 3    Connecting cable | |
| NEBU-…-M8G3 | M8 socket, 3-pin |
| | M8 socket, 4-pin |
| | Socket M12, 5-pin |
| | Open cable end |

## Accessory selection aid

| Connection for inputs M12, 5-pin | Connection for inputs, tension-spring socket |
|---|---|



| 1 Input modules | 2 Plug connector | | 1 Input modules | 2 Plug connector | |
|---|---|---|---|---|---|
| Type | Type | Connection technology | Type | Type | Connection technology |
| CP-E16-M12x2-5POL | SEA-M12-5GS-PG7 | Screw terminal | CP-E16-KL-CL | PS1-SAC31-30POL+ LED | Screw-in tension-spring socket |
| CP-E16N-M12-EL | SEA-5GS-11-DUO | Screw terminal | | | |
| CP-E08-M12-CL | | | | | |

Subject to change – 2019/05

**Accessory selection aid**

Connection for outputs M12, 5-pin
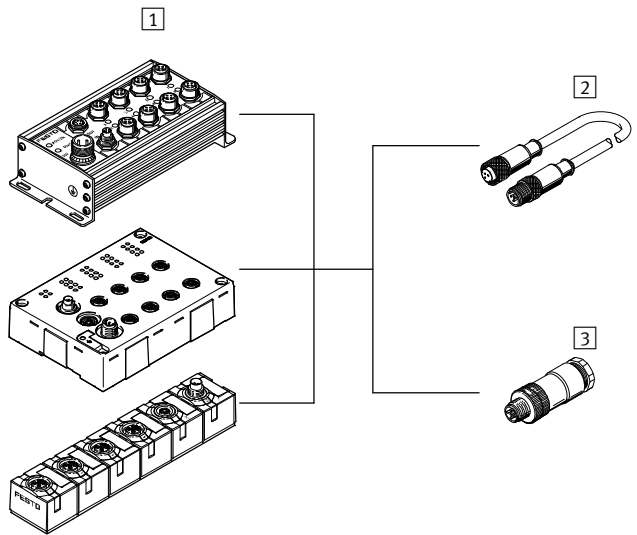


| 1 Output modules |
|---|
| Type |
| |
| CP-A08-M12-5POL |
| CP-A08-M12-EL-Z |
| CP-A04-M12-CL |

| Plug connector/connecting cable | |
|---|---|
| Type | Connection technology |
| 2 Connecting cable | |
| NEBU-…-M12G5 (Modular system for all types of connecting cables) | Socket M12, 5-pin |
| | Open cable end |
| | |
| 3 Plug connector | |
| SEA-M12-5GS-PG7 | Screw terminal |
| SEA-5GS-11-DUO | Screw terminal |

# CPI installation system

Technical data – Input modules CP-E16

## Function

Digital input modules facilitate the connection of proximity sensors or other 24 V DC sensors (inductive, capacitive, etc.).
M12 plugs with double allocation are separated using sensor/actuator distributors.

## Application

- Input modules for 24 V DC sensor signals
- M8 and M12 plugs, single allocation connection technology with 16 connections, double allocation connection technology with 8 connections
- M12 plug, 5-pin
- The input statuses are indicated for each input signal on 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

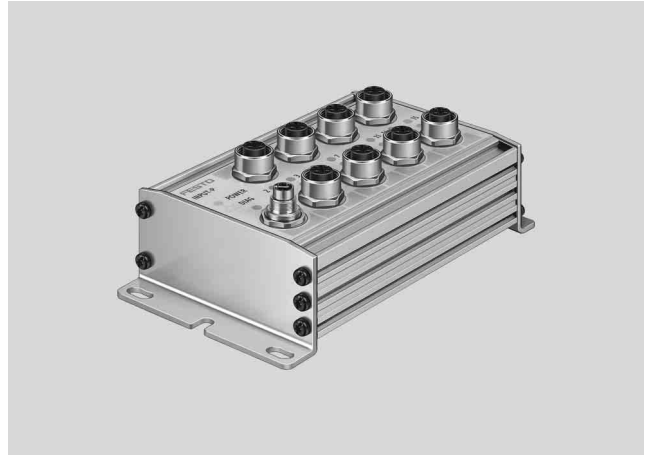| General technical data | | | | |
|---|---|---|---|---|
| Type | | | **CP-E16-M8** <br> **positive switching** | **CP-E16-M12x2-5POL** <br> **positive switching** |
| No. of inputs | | | 16 | |
| Allocation of inputs | | | Single allocation | Double allocation |
| Sensor connection type | | | 16x M8, 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 electronic module | | | Internal electronic short circuit protection | |
| Max. current consumption of sensor supply, residual current | | [A] | Max. 0.5 | |
| Supply voltage of sensors | | [V] | 24 DC ±25% | |
| Protection against polarity reversal | | | For logic and sensor voltage | |
| Galvanic isolation | | | None | |
| Switching level | Signal 0 | [V] | ≤5 | ≤6 |
| | Signal 1 | [V] | ≥11 | ≥8.6 |
| Input delay | | [ms] | Typically 5 | Typically 3 |
| Switching logic | | | PNP | PNP |
| Input characteristic curve | | | To IEC 1131-2 | |
| Connection to bus node | | | Via pre-assembled cables | |
| Protection class 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 | | [mm] | 148.9 x 66 x 47.9 | 140.9 x 78 x 55.2 |
| Weight | | [g] | 400 | 500 |

| General technical data | | | | |
|---|---|---|---|---|
| Type | | | **CP-E16-M8-Z** **positive and negative switching** | |
| No. 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 electronic module | | | Electronic short circuit protection per group | |
| Max. current consumption of sensor supply, residual current | | [A] | Max. 1 per 8-fold input group | |
| Supply voltage of sensors | | [V] | 24 DC ±25% | |
| Protection against polarity reversal | | | 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 curve | | | To IEC 1131-2 | |
| Connection to bus node | | | Via pre-assembled cables | |
| Protection class 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 | |
| Material note | | | Conforms to RoHS | |
| Dimensions | | [mm] | 216.9 x 66 x 50.6 | |
| Weight | | [g] | 420 | |

| Certifications | | |
|---|---|---|
| | | **CP-E16-M...** |
| ATEX category gas | | II 3G |
| Ex-ignition protection type gas | | Ex na II T5 X Gc |
| ATEX category dust | | II 3D |
| EX-ignition protection type dust | | Ex tc IIIC T80° C X Dc IP65 |
| ATEX ambient temperature | [°C] | −5 ≤ Ta ≤ +50 |
| CE mark (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 applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.
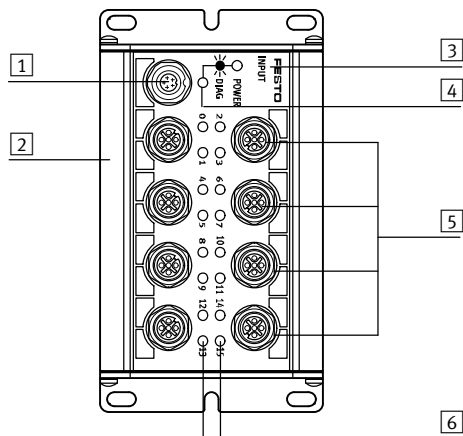
## Connection and display components
### CP-E16-M12x2-5POL



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

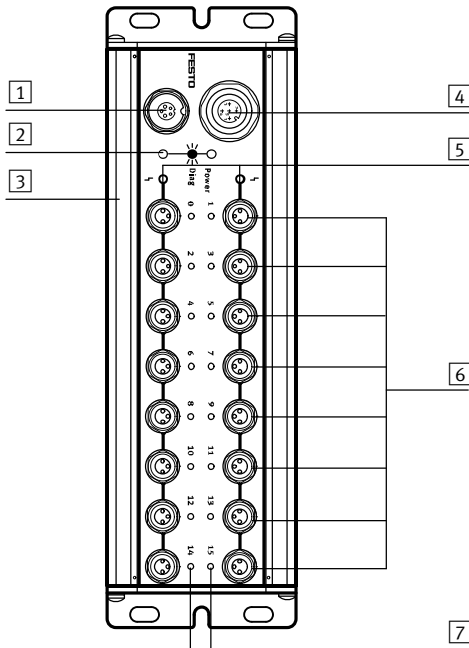| Pin allocation for sensor connections CP-E16-M12x2-5Pol | | | | | |
|---|---|---|---|---|---|
| Pin allocation | Pin | Signal | Description | Pin | Signal |
|  | 1 | 24 V | Operating voltage 24 V | 1 | 24 V |
| | 2 | Ix+1* | Sensor signal | 2 | Ix+3* |
| | 3 | 0 V | Operating voltage 0 V | 3 | 0 V |
| | 4 | Ix* | Sensor signal | 4 | Ix+2* |
| | 5 | Ground | Earth terminal | 5 | Ground |

# CPI installation system

Technical data – Input modules CP-E16

## Connection and display components

CP-E16-M8-Z



| | |
|---|---|
| 1 | CP connection |
| 2 | Status LED (green) |
| 3 | Slot for inscription labels (ISB-6x10) |
| 4 | Connection for external sensor supply |
| 5 | Red LED for short circuit display or sensor voltage failure (one LED per input group) |
| 6 | Sensor connections |
| 7 | Green LED for status display (one LED per input) |

### Pin allocation for external sensor supply CP-E16-M8-Z

| Pin allocation | Pin | Signal | Description | |
|---|---|---|---|---|
|  | 1 | 24 V DC ±25% | Operating voltage | **Note** |
| | 2 | PNP/NPN | Coding with negative/positive switching:<br>– PNP operation (pin 2 and 3 bridged)<br>– NPN operation (pin 2 and 1 bridged) | External sensor supply for CP-E16-M8-Z:<br>Specified for PNP or NPN operation (type CP-E16-M8-Z). |
| | 3 | 0 V | Operating voltage 0 V | The input module provides PNP or NPN inputs. The setting for PNP or NPN operation is made by installing a bridge in the socket of the sensor supply connection. |
| | 4 | n.c. | Not connected | |
| | 5 | Ground | Earth terminal | |

### Pin allocation for sensor connections CP-E16-M8-Z

| Pin allocation | Pin | Signal | Description | 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

## Connection and display components

### CP-E16-M8



| 1 | CP connection |
|---|---|
| 2 | Slot for inscription labels (ISB-6x10) |
| 3 | Status LED (green) |
| 4 | Sensor connections |
| 5 | Green LED for status display (one LED per input) |

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

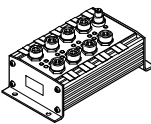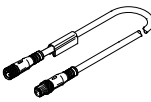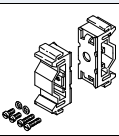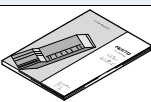| Pin allocation | Pin | Signal | Description | Pin | Signal |
|---|---|---|---|---|---|
|  | 1 | 24 V | Operating voltage 24 V | 1 | 24 V |
| | 3 | 0 V | Operating voltage 0 V | 3 | 0 V |
| | 4 | Ix* | Sensor signal | 4 | Ix+1* |

\* Ix = Input x

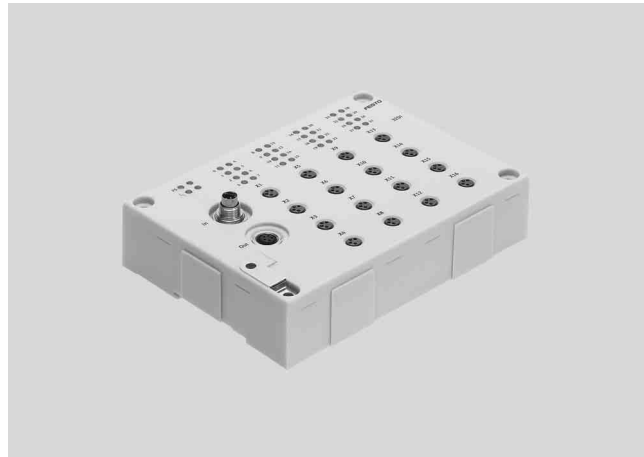| Ordering data | | | | | | |
|---|---|---|---|---|---|---|
| Designation | | | | | Part No. | Type |
| **Input modules** | | | | | | |
| | positive switching | | | | **18205** | **CP-E16-M8** |
| | positive switching | | | | **175561** | **CP-E16-M12x2-5POL** |
| | positive and negative switching | | | | **189670** | **CP-E16-M8-Z** |
| | | | | | | |
| **Power supply** | | | | | | |
| | Power supply socket, straight, M12x1, 5-pin | | | | **18324** | **FBSD-GD-9-5POL** |
| | | | | | | |
| **Sensor plugs** | | | | | | |
| | 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 sensor 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 all types of connecting cable | | | | – | **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** |

## Function

Digital input modules facilitate the connection of proximity sensors or other 24 V DC sensors (inductive, capacitive, etc.).
Plugs with double allocation are separated using sensor/actuator distributors.

## 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<br>positive switching | CP-E16-M8-EL<br>positive switching |
|---|---|---|---|---|
| Type | | | CP-E16-M12-EL<br>positive switching | CP-E16-M8-EL<br>positive switching |
| No. 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 mA | |
| Fuse (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, channel – channel | | | None | |
| Switching level | Signal 0 | [V] | ≤ 6 | |
| | Signal 1 | [V] | ≥ 8.6 | |
| Debounce time at inputs | | [ms] | 3 ms (0.5 ms, 10 ms, 20 ms, parameterisable) | |
| Switching logic | | | PNP | |
| Input characteristic curve | | | To IEC 1131-T2 | |
| Connection to bus node | | | Via pre-assembled cables | |
| Diagnostics | | | CP communication | |
| | | | Short circuit/overload | |
| | | | Undervoltage | |
| LEDs | | | 2 Module diagnostics | |
| | | | 16 Channel status | |
| | | | 4 Group diagnostics | |

| Materials | |
|---|---|
| Housing | Reinforced polyamide |
| Cap | Reinforced polyamide |
| Note on materials | Conforms to RoHS |

| Operating and environmental conditions | | |
|---|---|---|
| Protection class to EN 60529 | | IP65, IP67 (when fully plugged in or fitted with protective cover) |
| Ambient temperature | [°C] | −5 ... +50 |
| Storage temperature | [°C] | −20 ... +70 |
| Corrosion resistance class CRC[1] | | 1 |
| CE mark (see declaration of conformity) | | In accordance with EU EMC directive[2] |
| KC mark | | KC-EMV |
| Certification | | c UL us listed (OL) |
| | | C-Tick |

[1]    Corrosion resistance class 1 to Festo standard 940 070
       Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.
[2]    For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ User documentation.
       If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.
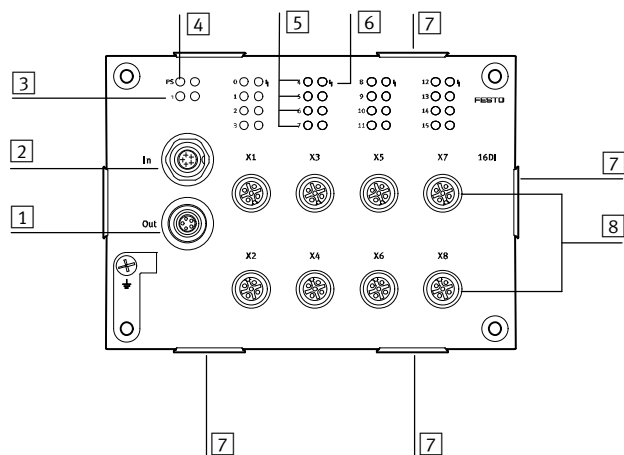
# CPI installation system

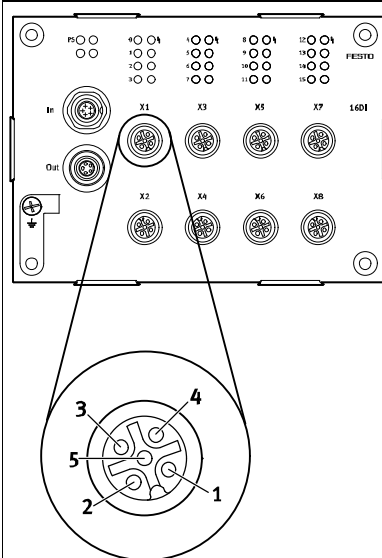Technical data – Input modules CP-E...-EL

## 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 display, 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

| Pin allocation | Pin | Signal | Description |
|---|---|---|---|
|  | 1 | 24 V | Operating voltage 24 V |
| | 2 | Ix+1* | Sensor signal |
| | 3 | 0 V | Operating voltage 0 V |
| | 4 | Ix* | Sensor signal |
| | 5 | Ground | Earth terminal |

\*     Ix = Input x
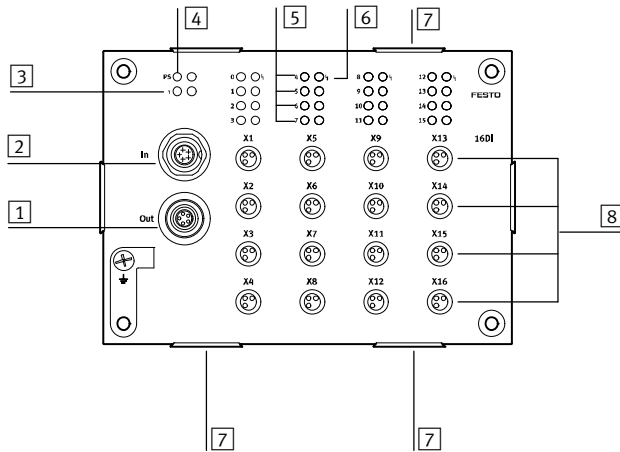
# CPI installation system

Technical data – Input modules CP-E…-EL

FESTO

## 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 display, 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) |

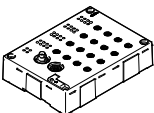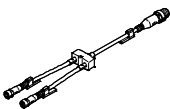## Pin allocation for sensor connections CP-E16-M8-EL
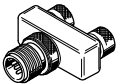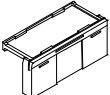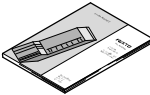
| Pin allocation | Pin | Signal | Description |
|---|---|---|---|
|  | 1 | 24 V | Operating voltage 24 V |
| | 3 | 0 V | Operating voltage 0 V |
| | 4 | Ix* | Sensor signal |

\*  Ix = Input x

| Ordering data | | | | | |
|---|---|---|---|---|---|
| Designation | | | | Part No. | Type |
| **Input modules** | | | | | |
|  | positive switching | | | 546923 | **CP-E16-M12-EL** |
| | positive switching | | | 546922 | **CP-E16-M8-EL** |
| | | | | | |
| **Plug connectors** | | | | | |
|  | Straight plug, 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** |
| | Straight plug, M8x1 | 3-pin | solderable | 18696 | **SEA-GS-M8** |
| | | 3-pin | screw-in | 192009 | **SEA-3GS-M8-S** |
|  | Plug for 2 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 distributors | | | – | **NEDY-…**<br>➔ Internet: nedy |
|  | T-plug connector | 1x plug, M8, 4-pin | 2x socket M8, 3-pin | 8005312 | **NEDY-L2R1-V1-M8G3-N-M8G4** |
| | | 1x plug connector 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** |

# CPI installation system

Technical data – Input modules CP-E…-CL

## Function

Digital input modules facilitate the connection of proximity sensors or other 24 V DC sensors (inductive, capacitive, etc.).
Plugs with double allocation are separated using sensor/actuator distributors.

## 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 are indicated for each input signal on 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 | | | | |
|---|---|---|---|---|
| Type | | **CP-E08-M12-CL**<br>**positive switching** | **CP-E08-M8-CL**<br>**positive switching** | **CP-E16-KL-CL**<br>**positive switching** |
| No. 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 electronic module | | Internal electronic short circuit protection | | |
| Max. current consumption of sensor supply, residual current | [A] | Max. 0.8 | | |
| Nominal operating voltage for sensors | | 24 | | |
| Operating voltage range for sensors | [V DC] | 18 … 30 | | |
| Protection against polarity reversal | | 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 curve | | To IEC 1131-2 | | |
| Connection to bus node | | Via pre-assembled cables | | |
| Diagnostics | | Undervoltage | | |
| | | Short circuit/overload of sensor supply | | |

## General technical data

| Type | | CP-E08-M12-CL<br>positive switching | CP-E08-M8-CL<br>positive switching | CP-E16-KL-CL<br>positive switching |
|---|---|---|---|---|
| Material note | | Conforms to RoHS | | |
| Dimensions (WxLxH) | [mm] | 151 x 30 x 25 | | |
| Weight | [g] | 165 | 190 | 145 |

## Operating conditions

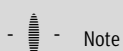| Type | | CP-E08-M12-CL | CP-E08-M8-CL | CP-E16-KL-CL |
|---|---|---|---|---|
| Protection class to EN 60529 | | IP65/IP67 (when fully plugged in or fitted with protective cap) | | IP20 |
| Ambient temperature | [°C] | −5 … +50 | | |
| Storage temperature | [°C] | −20 … +70 | | |
| Corrosion resistance class CRC[1] | | 1 | | |
| CE mark (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 1 to Festo standard 940 070
   Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.
2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ User documentation.
   If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

## Certifications ATEX

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

-ⁱ- Note

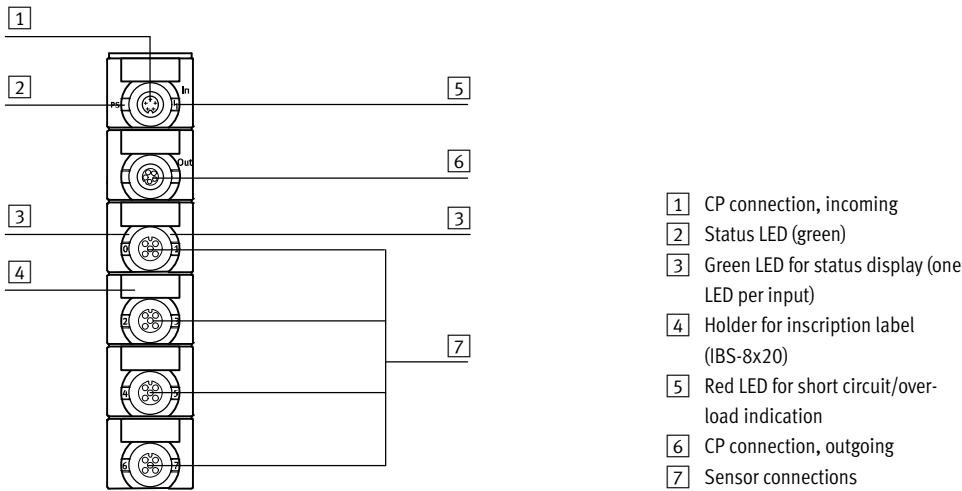If device combinations are operated in potentially explosive areas, the lowest common zone, the temperature class as well as the ambient temperature of the individual devices determine the possible use of the complete module.

# CPI installation system

Technical data – 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 display (one LED per input) |
| 4 | Holder for inscription label (IBS-8x20) |
| 5 | Red LED for short circuit/overload indication |
| 6 | CP connection, outgoing |
| 7 | Sensor connections |

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

| Pin allocation | Pin | Signal | Description |
|---|---|---|---|
|  | 1 | 24 V | Operating voltage 24 V |
| | 2 | Ix+1* | Sensor signal |
| | 3 | 0 V | Operating voltage 0 V |
| | 4 | Ix* | Sensor signal |
| | 5 | Ground | Earth terminal |

*    Ix = Input x

## 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/over-
   load indication
5 CP connection, outgoing
6 Sensor connections
7 Green LED for status display (one
   LED per input)

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

| Pin allocation | Pin | Signal | Description | 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

# CPI installation system

Technical data – Input modules CP-E…-CL

## Connection and display components
### CP-E16-KL-CL
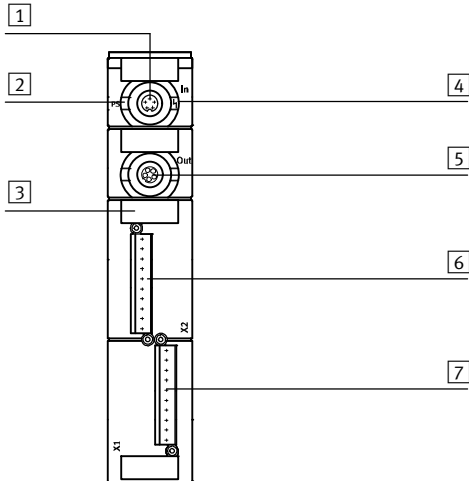


1 CP connection, incoming
2 Status LED (green)
3 Holder for inscription label
  (IBS-8x20)
4 Red LED for short circuit/over-
  load indication
5 CP connection, outgoing
6 Sensor connections, plug X2
7 Sensor connections, plug X1

**Pin allocation for sensor supply CP-E16-KL-CL**

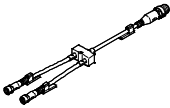| Pin allocation | Pin | Signal | Description | Pin | Signal | |
|---|---|---|---|---|---|---|
| | | Plug X1 | | | Plug X2 | **Note** |
| | + | 24 V DC | Operating voltage | + | 24 V DC | 8 sensors can be connected to each |
| | 0 | I 0 | Connections for sensors | 0 | I 8 | of the connections X1 and X2. |
| | 1 | I 1 | | 1 | I 9 | When using the three-row plug |
| | 2 | I 2 | | 2 | I 10 | PS1-SAC30-30POL or |
| | 3 | I 3 | | 3 | I 11 | PS1-SAC31-30POL+LED, it is |
| | 4 | I 4 | | 4 | I 12 | possible to use the second and third |
| | 5 | I 5 | | 5 | I 13 | contact bank for the sensor power |
| | 6 | I 6 | | 6 | I 14 | supply via a bridge. |
| | 7 | I 7 | | 7 | I 15 | |
| | – | 0 V DC | | - | 0 V DC | |
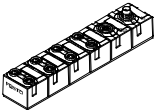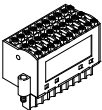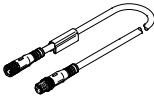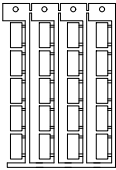
Plug connection for power supply for sensors (PS1-SAC31-30POL+LED)

| | | Connection row 0 | | Connection row 1 | | Connection row 2 | |
|---|---|---|---|---|---|---|---|
| | – | 0 V DC | Operating voltage | - | n.c. | - | Jumper |
| | 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 | + | Jumper | + | n.c. |

| Ordering data | | | | |
|---|---|---|---|---|
| Designation | | | Part No. | Type |
| **Input modules** | | | | |
| | positive switching | | 538787 | **CP-E08-M12-CL** |
| | positive switching | | 538788 | **CP-E08-M8-CL** |
| | positive switching | | 538789 | **CP-E16-KL-CL** |
| | | | | |
| **Sensor plugs** | | | | |
| | 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** |
| | Straight plug, M8x1 | 3-pin | solderable | 18696 | **SEA-GS-M8** |
| | | 3-pin | screw-in | 192009 | **SEA-3GS-M8-S** |
| | Plug for 2 sensor 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 distributors | | – | **NEDY-…** ➔ Internet: nedy |
| | | | | |
| **Connecting cables** | | | | |
| | Modular system for all types of connecting cable | | – | **NEBU-…** ➔ Internet: nebu |
| | | | | |
| **Inscription labels** | | | | |
| | Inscription labels 8x20 mm in frames (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** |

# CPI installation system

## Function

The electrical outputs activate actuators such as individual valves, lamps, signal equipment and many more.

- ⧍ - Note

Optimum actuation of valves with M12 central plug.
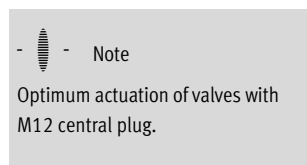
## Application

- Output module with 8 outputs 24 V DC
- M12 connection technology, 5-pin sockets
- LED display of the switching status per channel
- Short circuit and overload detection
- Malfunction display by means of green LED
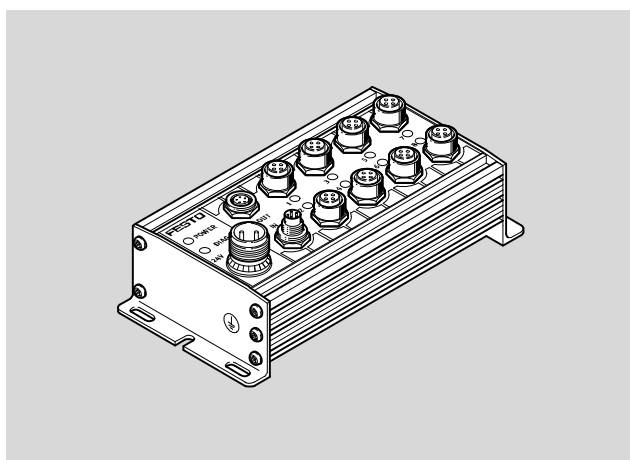
| General technical data | | | |
|---|---|---|---|
| Type | | | **CP-A08-M12-5POL** **positive switching** |
| No. of outputs | | | 8 |
| Allocation of outputs | | | Single allocation |
| Output connection type | | | 8x M12, 5-pin |
| Load voltage connection | | | M18, 4-pin |
| Bus connection | | | 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%, protected against incorrect polarity |
| Fuse protection for power output | | [A] | Electronic fuse per output 0.5 |
| Intrinsic current consumption, electronics | | [mA] | Max. 90 |
| Overload/short circuit protection | | | Per channel |
| Switching logic | | | PNP to IEC 1131-2 |
| Protection class 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 (L x W x D) | | [mm] | 172.9 x 78 x 57.1 |
| Weight | | [g] | 500 |

| Certifications | | |
|---|---|---|
| ATEX category gas | | II 3G |
| Ex-ignition protection type gas | | Ex na IIC T5 X Gc |
| ATEX category dust | | II 3D |
| EX-ignition protection type dust | | Ex tc IIIC T80° C X Dc IP65 |
| ATEX ambient temperature | [°C] | −5 ≤ Ta ≤ +50 |
| CE mark (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 applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.
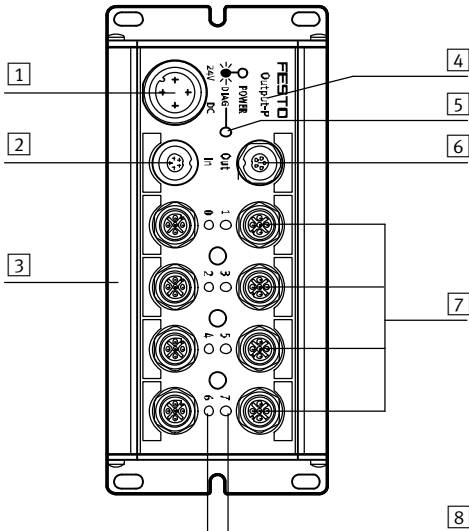
# CPI installation system

Technical data – Output modules CP-A08

## Connection and display components

### CP-A08-M12…



- [1] Load voltage connection
- [2] CP connection, incoming
- [3] Slot for inscription labels (IBS-6x10)
- [4] Identifier 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 output)

### Pin allocation for load voltage connection CP-A08-M12…

| Connection 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 (earth) | Protective earth |

### Pin allocation for outputs
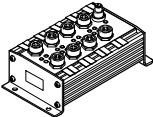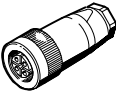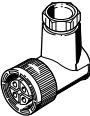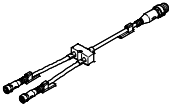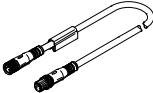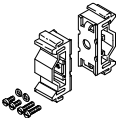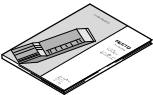
| Terminal allocation | Pin | Signal | Designation | Pin | Signal | |
|---|---|---|---|---|---|---|
| **CP-A08-M12-5POL (PNP outputs)** | | | | | | |
|  | 1 | n.c. | Not connected | 1 | n.c. | - Note |
| | 2 | Ox+1 | Connected with pin 4 of plug 2/ not connected | 2 | n.c. | Two outputs can be connected to output sockets 0, 2, 4 and 6 of the CP output module by means of internal connection between pin 2 of the even numbered output and pin 4 of the opposite odd numbered output. |
| | 3 | 0 V | Reference potential | 3 | 0 V | |
| | 4 | Ox | Output/connected with pin 2 of plug 1 | 4 | Ox+1 | |
| | 5 | Load | Earth terminal | 5 | Load | |

\*     Ox = Output x

## Ordering data

| Designation | | | | Part No. | Type |
|---|---|---|---|---|---|
| **Output modules** | | | | | |
| | Positive switching | | | **175640** | **CP-A08-M125POL** |
| **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 plugs** | | | | | |
| | Plug, straight socket, M12x1 | 5-pin | | **175487** | **SEA-M12-5GS-PG7** |
| | Plug for 2 sensor 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 distributors | | | – | **NEDY-…** ➔ Internet: nedy |
| **Connecting cables** | | | | | |
| | Modular system for all types of connecting cable | | | – | **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** |

## Function

The electrical outputs actuate actuators such as individual valves, lamps, signal equipment and many more.

- 🔆 - Note

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

## 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 means of 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
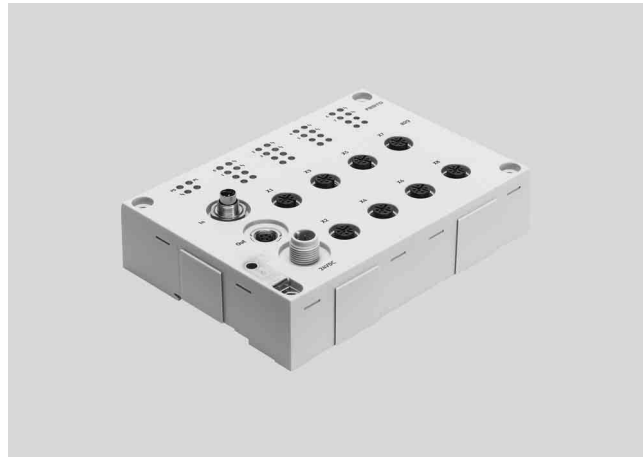
| General technical data | | |
|---|---|---|
| Type | | CP-A08-M12-EL-Z<br>positive switching |
| No. of outputs | | 8 |
| Allocation of outputs | | Connection 1, 3, 5 and 7 with double allocation, connection 2, 4, 6 and 8 with single allocation |
| Sensor connection type | | 8x M12, 5-pin |
| Power 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 |
| Fuse (short circuit) | | Internal electronic fuse protection for each group |
| Switching logic | | PNP |
| Output characteristic curve | | To ICE 1131-T2 |
| Electrical isolation, channel – channel | | None |
| Connection to bus node | | Via pre-assembled cables |
| Diagnostics | | CP communication |
| | | Short circuit/overload per channel |
| | | Undervoltage |
| LEDs | | 3 Module diagnostics |
| | | 8 Channel status |
| | | 8 Channel diagnostics |

Technical data – Output modules CP-A08-EL

**FESTO**
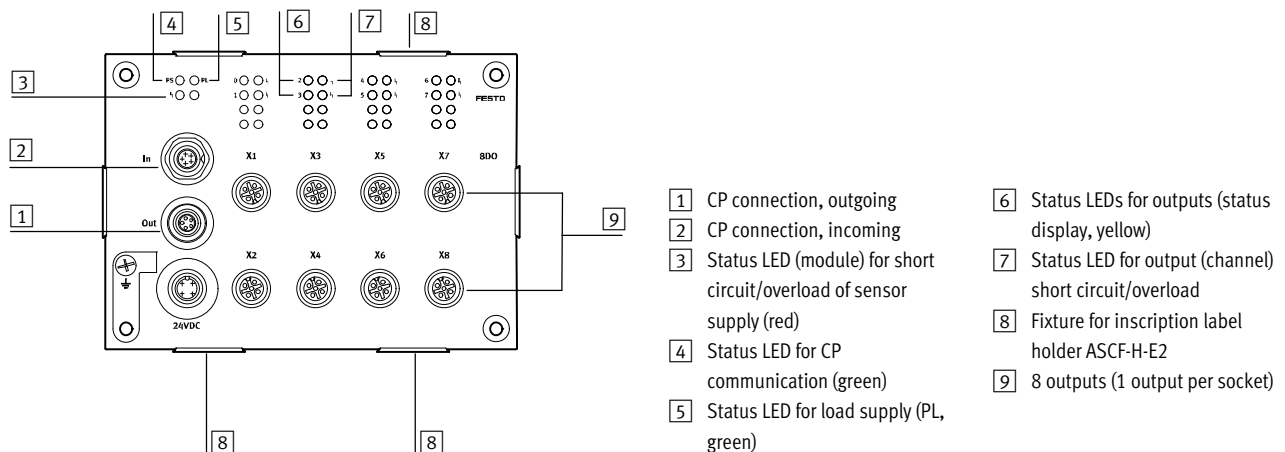
| Materials | |
|---|---|
| Housing | Reinforced polyamide |
| Cap | Reinforced polyamide |
| Note on materials | Conforms to RoHS |

| Operating and environmental conditions | | |
|---|---|---|
| Protection class to EN 60529 | | IP65, IP67 (when fully plugged in or fitted with protective cover) |
| Ambient temperature | [°C] | −5 … +50 |
| Storage temperature | [°C] | −20 … +70 |
| Corrosion resistance class CRC[1] | | 1 |
| CE mark (see declaration of conformity) | | In accordance with EU EMC directive[2] |
| KC mark | | KC-EMV |
| Certification | | c UL us listed (OL) |
| | | C-Tick |

[1]   Corrosion resistance class 1 to Festo standard 940 070
       Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.
[2]   For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ User documentation.
       If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

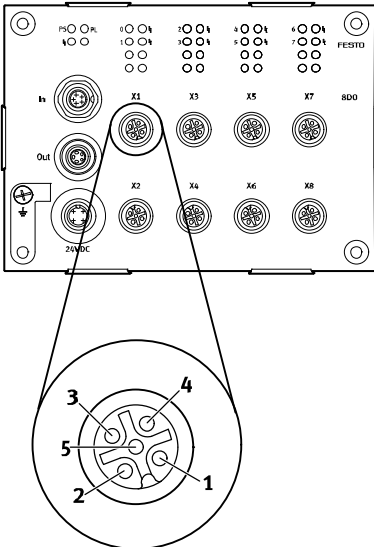| Connection and display components |
|---|
| CP-A08-M12-EL-Z |



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

| Pin allocation for load voltage connection CP-A08-M12-EL-Z | | | |
|---|---|---|---|
| Pin allocation | Pin | Signal | Description |
|  | 1 | n.c. | Not connected |
| | 2 | 24 V DC ±25% | Operating voltage |
| | 3 | 0 V | Operating voltage 0 V |
| | 4 | FE | Protective earth |

## Pin allocation for outputs

| Pin allocation | Output 1, 3, 5 and 7 | | Description |
|---|---|---|---|
| | Pin | Signal | |

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



| | Pin | Signal | Description | |
|---|---|---|---|---|
| | 1 | n.c. | Not connected | - ▮ - Note |
| | 2 | Ox+1 | Connected with pin 4 of output 2 | Two outputs can be connected to output sockets 1, 3, 5 and 7 of the CP output module by means of internal connection between pin 2 of the odd numbered output and pin 4 of the underlying even numbered output. |
| | 3 | 0 V | Reference potential | |
| | 4 | Ox | Output | |
| | 5 | FE | Earth terminal | |

\*    Ox = Output x

## Pin allocation for outputs

| Pin allocation | Output 2, 4, 6 and 8 | | Description |
|---|---|---|---|
| | Pin | Signal | |

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



| | Pin | Signal | Description |
|---|---|---|---|
| | 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 |
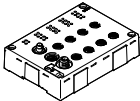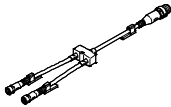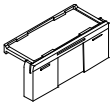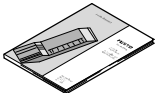
\*    Ox = Output x

## Ordering data

| Designation | | | | Part No. | Type |
|---|---|---|---|---|---|
| **Output modules** | | | | | |
| | positive switching | | | **546924** | **CP-A08-M12-EL-Z** |
| **Plug connectors** | | | | | |
| | Straight plug, 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 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 distributors | | | **–** | **NEDY-…**<br>➔ Internet: nedy |
| **Inscription label holders** | | | | | |
| | Inscription label holders for EL modules, bag of 10 | | | **547473** | **ASCF-H-E2** |
| **User documentation** | | | | | |
| | User documentation for input/output modules | German | | **539299** | **P.BE.-CPEA-CL-DE** |
| | | English | | **539300** | **P.BE.-CPEA-CL-EN** |
| | | French | | **539302** | **P.BE.-CPEA-CL-FR** |
| | | Italian | | **539303** | **P.BE.-CPEA-CL-IT** |
| | | Spanish | | **539301** | **P.BE.-CPEA-CL-ES** |

# CPI installation system

**Function**

The electrical outputs actuate actuators such as individual valves, lamps, signal equipment and many more.

- - Note

Optimum actuation for valves with M12 central plug.

**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 means of red LED
- Module supports the CPI functionality (only in combination with the CPX CP interface)

| General technical data | | |
|---|---|---|
| Type | | **CP-A04-M12-CL**<br>**positive switching** |
| No. 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 curve | | 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 |

## Operating conditions

| | | |
|---|---|---|
| Protection class 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 mark (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 1 to Festo standard 940 070
   Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.
2) For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➜ User documentation.
   If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

## Certifications ATEX

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

**Note**

If device combinations are operated in potentially explosive areas, the lowest common zone, the temperature class as well as the ambient temperature of the individual devices determine the possible use of the complete module.
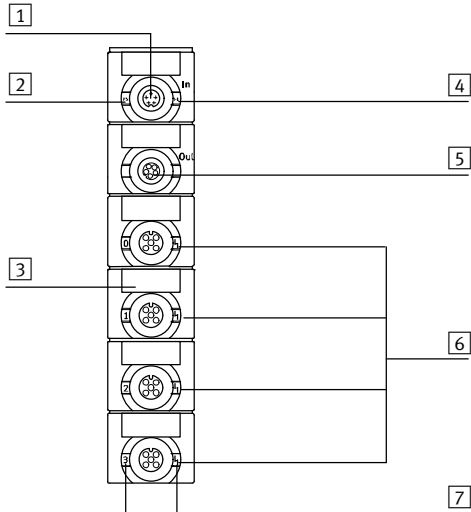
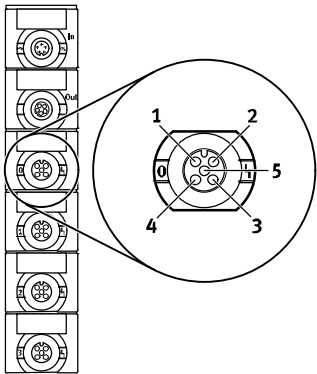# CPI installation system

Technical data – 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/over-load indication
5 CP connection, outgoing
6 Output
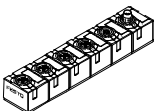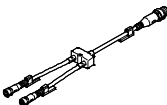7 Green LED for status display (one LED per output)

## Pin allocation for outputs
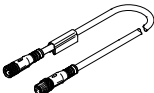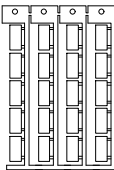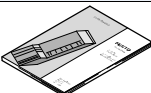
| Pin allocation | Output 1 and 3 | | Description | Output 2 and 4 | | |
|---|---|---|---|---|---|---|
| | Pin | Signal | | Pin | Signal | |
| CP-A08-M12-5POL (PNP outputs) | | | | | | |
| | 1 | n.c. | Not connected | 1 | n.c. | Note |
| | 2 | Ox+1 | Connected with pin 4 of plug 2/ not connected | 2 | n.c. | Two outputs can be connected to output sockets 1 and 3 of the CP output module by means of internal connection between pin 2 of the odd numbered output and pin 4 of the underlying even numbered output. |
| | 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 | |

\*      Ox = Output x

| Ordering data | | | | | |
|---|---|---|---|---|---|
| Designation | | | | Part No. | Type |
| **Output modul** | | | | | |
| | Positive switching | | | **538790** | **CP-A04_M12_CL** |
| **Sensor plugs** | | | | | |
| | 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 sensor 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 distributors | | | **–** | **NEDY-…** → Internet: nedy |
| **Connecting cables** | | | | | |
| | Modular system for all types of connecting cable | | | **–** | **NEBU-…** → Internet: nebu |
| **Inscription labels** | | | | | |
| | Inscription labels 8x20 mm in frames (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** |

# CPI installation system

Technical data – CTEU-CP

CPI interface for integrating components with I-Port interface into the installation system CPI from Festo.

The module has basic diagnostic functions. It has 4 integrated LEDs for on-site display. A maximum of 4 byte inputs and 4 byte outputs are transmitted in the cyclic process image.

| Application | | | |
|---|---|---|---|
| **Fieldbus connection/power supply** | | | |
| In the CPI system, the power supply and the communication signal are routed via a common port. | The bus node additionally has an M9 plug connector for connection to the signal coming from the CPI master and an M9 socket for transmitting the signal to other CPI modules. | The series connection of CPI modules (string) can contain a maximum of 4 modules with CPI functionality. The number of outputs/inputs per string is limited to 32 of each. | The maximum length of a string is 10 m. |
| **I-Port interface** | | | |
| The bus node supports two interfaces for connecting I-Port devices. | When mounting the bus node on a valve terminal (direct integration) only one interface is used. | When using the bus node CTEU-CP on the electrical connection block CAPC (installation system CTEL), both interfaces are available via the connection block. | The total number of inputs/outputs that can be connected is limited by the overall configuration of the CP string. |

| General technical data | | | |
|---|---|---|---|
| Type | | | CTEU-CP |
| Fieldbus interface | | | • Plug M9x0.5, 5-pin, <br> • Socket M9x0.5, 5-pin |
| Protocol | | | CPI-B |
| Number of internal communication interfaces | | | 2 |
| Internal communication protocol | | | I-Port |
| Baud rates | | [kbps] | 1000 |
| Internal cycle time | | [ms] | 2 |
| Operating voltage | Nominal value | [V DC] | 24 |
| | Permissible range | [V DC] | 18 … 30 |
| Intrinsic current consumption at nominal operating voltage | | [mA] | Typically 50 |
| Max. power supply | | [A] | 3.4 |
| Max. address capacity, inputs | | [byte] | 4 |
| Max. address capacity, outputs | | [byte] | 4 |
| Device-specific diagnostics | | | • System diagnostics <br> • Undervoltage <br> • Communication error |
| LED display | Bus-specific | | • RUN: Communication OK |
| | Product-specific | | • PS: Operating voltage for electronics and load supply <br> • X1: System status of module at I-Port 1 <br> • X2: System status of module at I-Port 2 |
| Parameterisation | | | Fail-safe response, diagnostic behaviour |
| Degree of protection to EN 60529 | | | IP65/IP67 |
| Note on materials | | | RoHS compliant |
| Information on materials - housing | | | • PC <br> • PA reinforced |
| Product weight | | [g] | 105 |
| Temperature range | Environment | [°C] | −5 … +50 |
| | Storage | [°C] | −20 … +70 |
| Dimensions W x L x H | | [mm] | 40 x 91 x 50 |
| Control elements | | | DIL switches |
| Corrosion resistance class CRC | | | 2[1] |
| CE marking | | | To EU EMC Directive[2] |
| Approval certificate | | | RCM mark |
| | | | c UL us listed (OL) |

[1] Corrosion resistance class CRC 2 to Festo standard FN 940070
Moderate corrosion stress. Indoor applications in which condensation may occur. External visible parts with primarily decorative requirements for the surface and which are in direct contact with the ambient atmosphere typical for industrial applications.

[2] For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.
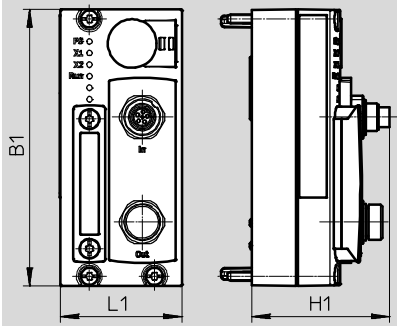
## Dimensions

Download CAD data ➔ **www.festo.com**
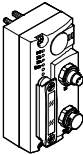


| Type | B1 | H1 | L1 |
|------|-----|------|-----|
| CTEU-CP | 91 | 45.4 | 40 |

## Connection and display components



1 Status LED (operating status/diagnostics)
2 DIL switch
3 CP connection, incoming
4 CP connection, outgoing
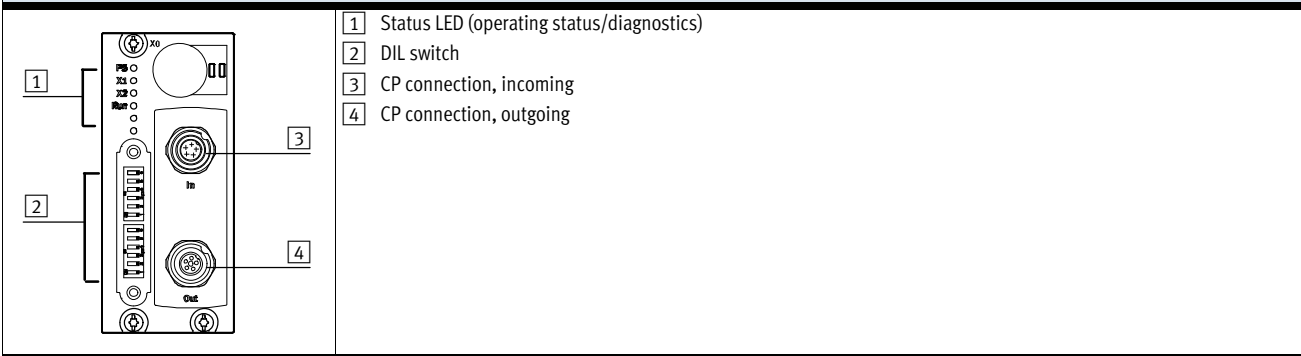
## Ordering data – Accessories

| | | Part No. | Type |
|---|---|---|---|
| **Bus node** | | | |
| | Bus node CP | **2149714** | **CTEU-CP** |
| **Connecting cable for fieldbus connection/power supply** | | | |
| | 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 connector – 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** |
| **Connector for fieldbus connection** | | | |
| | Straight plug, 5-pin, M9 Straight socket, 5-pin, M9 | **543252** | **KVI-CP-3-SSD** |

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 an MPA-S valve terminal and a CPI master. It activates an MPA-S valve terminal with up to 32 solenoid coils on max. 16 valve positions.

Note

With more than 16 MPA2 solenoid coils an additional electrical supply is absolutely necessary (after 4 electronic modules).
Note that without an additional electrical supply maximum 24 solenoid coils may be switched. If more than 24 MPA1, 24 MPA14 or 12 MPA2 solenoid coils are to be switched simultaneously, an additional supply must be inserted after the third electronic module.

| General technical data | | |
|---|---|---|
| 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. no. of pressure zones | | 9 |
| LED display (product-specific) | PS | Common message regarding power supply |
| | PL | Power supply for valves |
| | Symbol | Module fault |
| Nominal operating voltage | [V DC] | 24 |
| Operating voltage range | [V DC] | 24 ±25% |
| Power failure bridging | 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 electronic modules) |
| Residual ripple | [Vss] | 4 |
| Materials | | Die-cast aluminium, PA |
| Note on materials | | Conforms to RoHS |
| Dimensions | | ➔ Internet: mpa-s |
| Weight | [g] | 220 |
| Technical data on valves | | ➔ Internet: mpa-s |
| Protection class to EN 60529 | | IP65 (when fully plugged in or fitted with protective cover) |

# CPI installation system
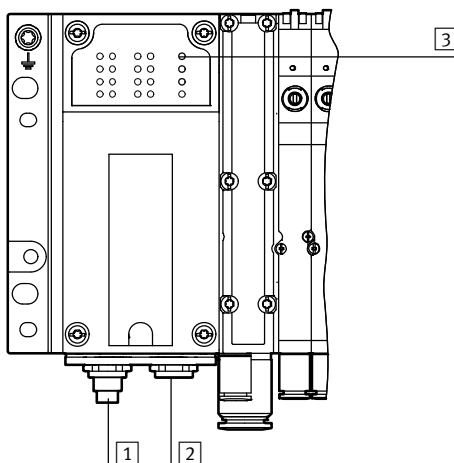
Technical data – MPA-S valve terminals

| Operating and environmental conditions | | |
|---|---|---|
| Operating medium | | Compressed air to ISO 8573-1:2010 [7:4:4] |
| Note about operating/pilot medium | | Lubricated operation possible (subsequently required for further operation) |
| Operating pressure | [bar] | −0.9 … +10 |
| Ambient temperature | [°C] | −5 … +50 |
| Medium temperature | [°C] | −5 … +50 |
| Storage temperature | [°C] | −20 … +40 |
| Relative air humidity | | Max. 90% at 40 °C |
| CE mark (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 trademark |

[1] For information about the applicability of the component see the manufacturer's EC declaration of conformity at: www.festo.com/sp ➔ User documentation.
If the component is subject to restrictions on usage in residential, office or commercial environments or small businesses, further measures to reduce the emitted interference may be necessary.

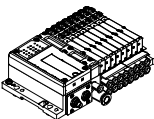| Certifications | | |
|---|---|---|
| ATEX category gas | | II 3G |
| Ex-ignition protection type gas | | Ex nA IIC T4 X Gc |
| Explosion-proof temperature rating | [°C] | −5 ≤ Ta ≤ +50 |

## 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)

| Ordering data – Accessories | | | |
|---|---|---|---|
| **Designation** | | 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** |
| | 8 m | **540331** | **KVI-CP-3-WS-WD-8** |
| Connecting cable GS-GD | 2 m | **540332** | **KVI-CP-3-GS-GD-2** |
| | 5 m | **540333** | **KVI-CP-3-GS-GD-5** |
| | 8 m | **540334** | **KVI-CP-3-GS-GD-8** |

CPX-FB… and CPX-CP-4-FB



| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Mounting holes | 3 | H-rail | 5 | CPX bus node | |
| 2 | Earthing screw | 4 | H-rail mounting | 6 | CPX-CP interface | |

# CPI installation system

Technical data

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**Dimensions – Sturdy input modules**  Download CAD data ➔ **www.festo.com**

### CP-E16-M8
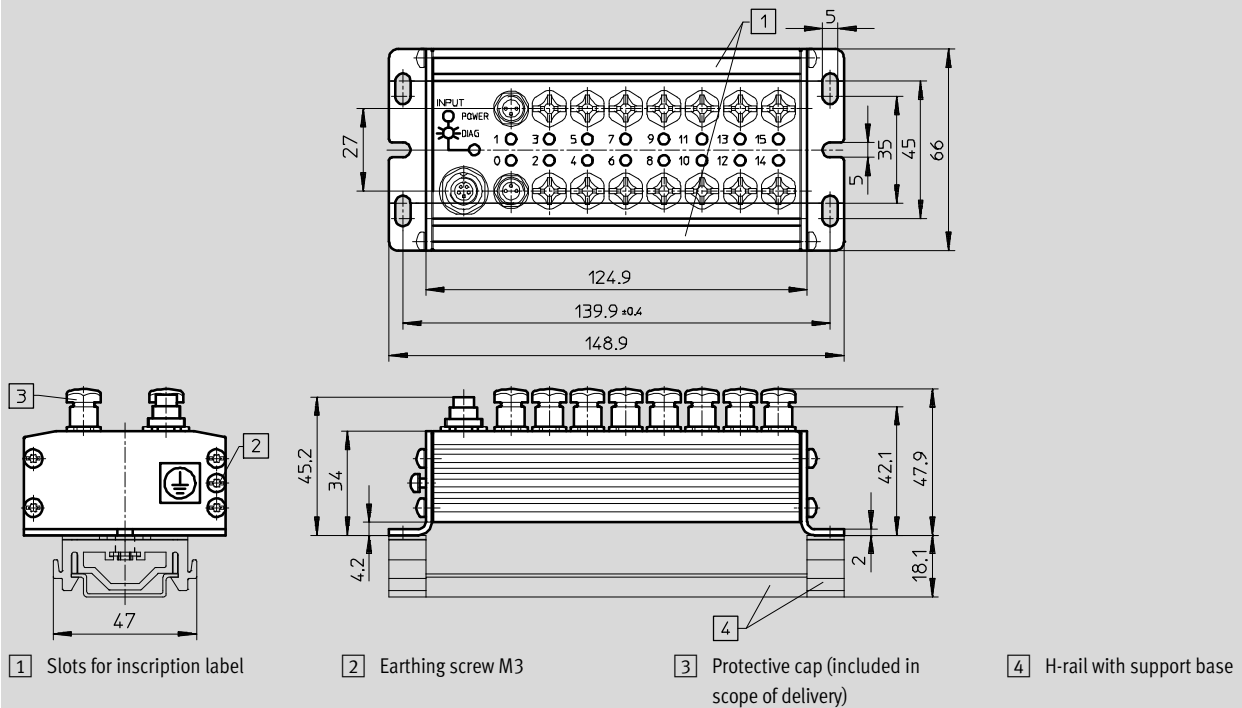


| 1 | Slots for inscription label | 2 | Earthing screw M3 | 3 | Protective cap (included in scope of delivery) | 4 | H-rail with support base |

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### CP-E16-M8-Z



| 1 | Slots for inscription label | 2 | Earthing screw M3 | 3 | Protective cap (included in scope of delivery) | 4 | H-rail with support base |

# CPI installation system

Technical data

**Dimensions – Sturdy input modules**                                            Download CAD data → **www.festo.com**

CP-E16-M12x2-5POL
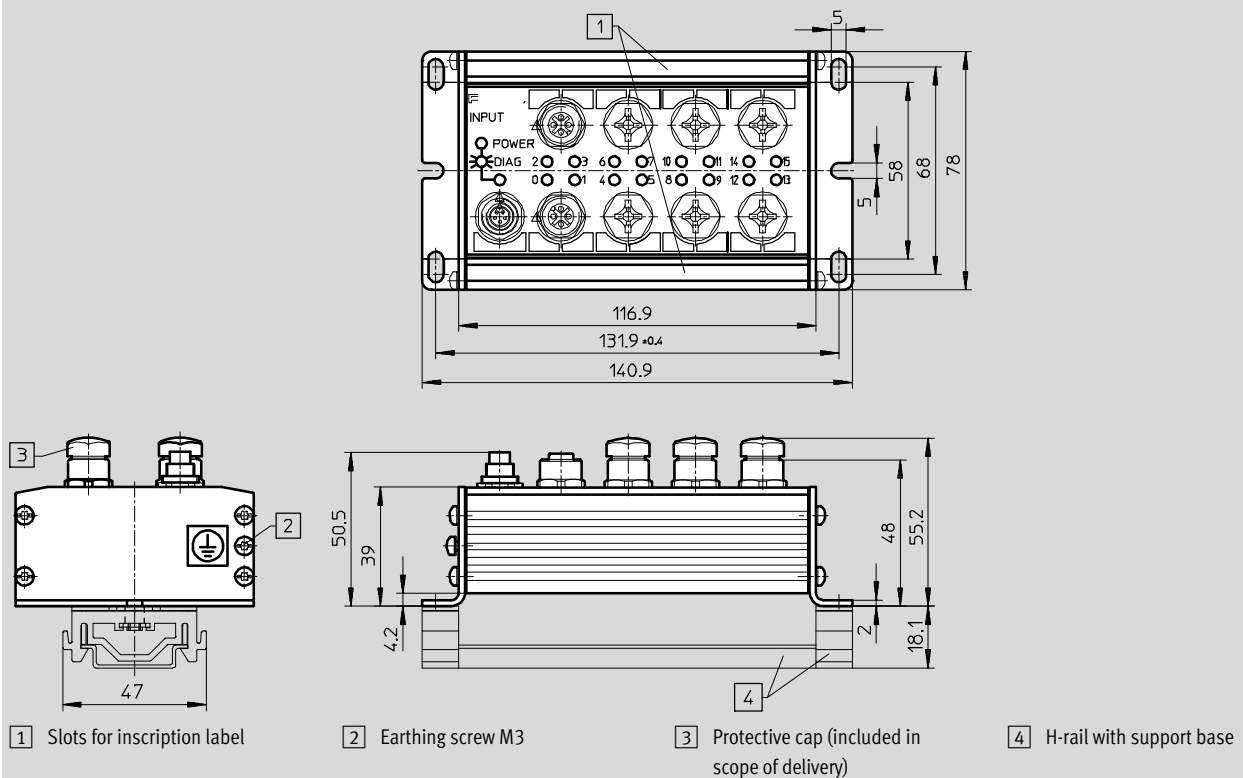


| [1] | Slots for inscription label | [2] | Earthing screw M3 | [3] | Protective cap (included in scope of delivery) | [4] | H-rail with support base |

# CPI installation system

Technical data

## 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)
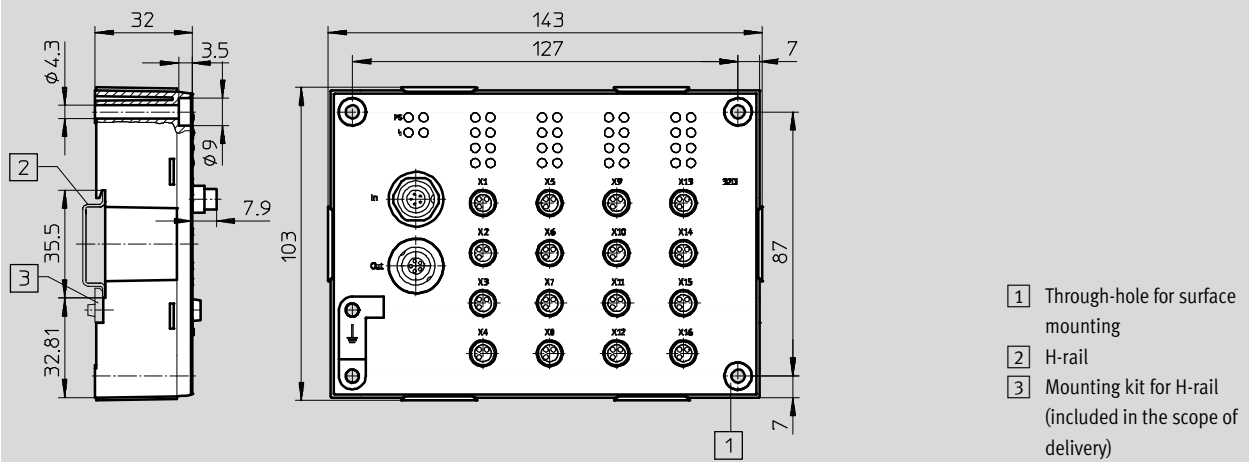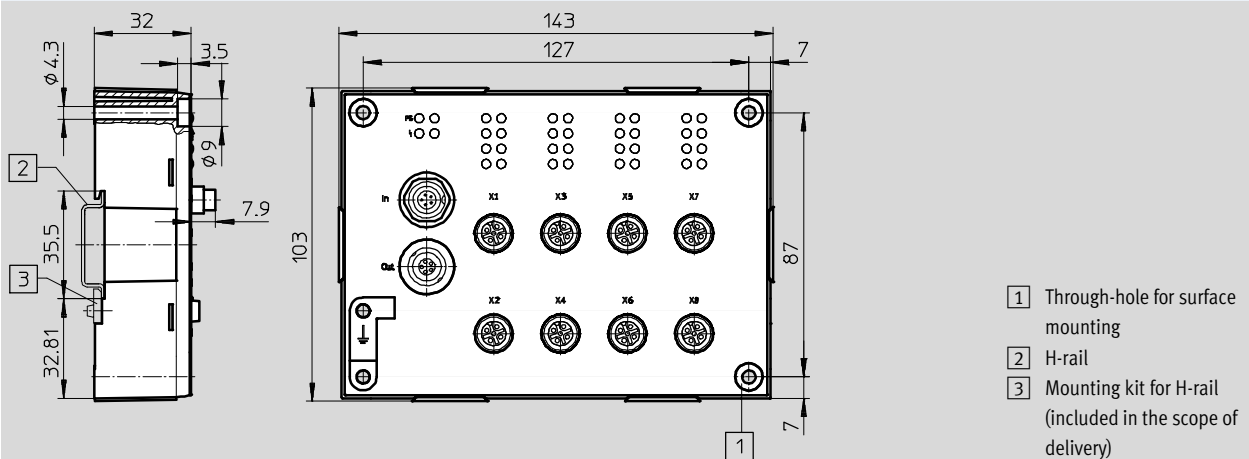
# CPI installation system

Technical data

## Dimensions – Sturdy output modules

Download CAD data ➔ **www.festo.com**

CP-A08-M12-5/CP-A08N-M12



| 1 | Slots for inscription label | 2 | Earthing screw M3 | 3 | Protective cap (included in scope of delivery) | 4 | H-rail with support base |
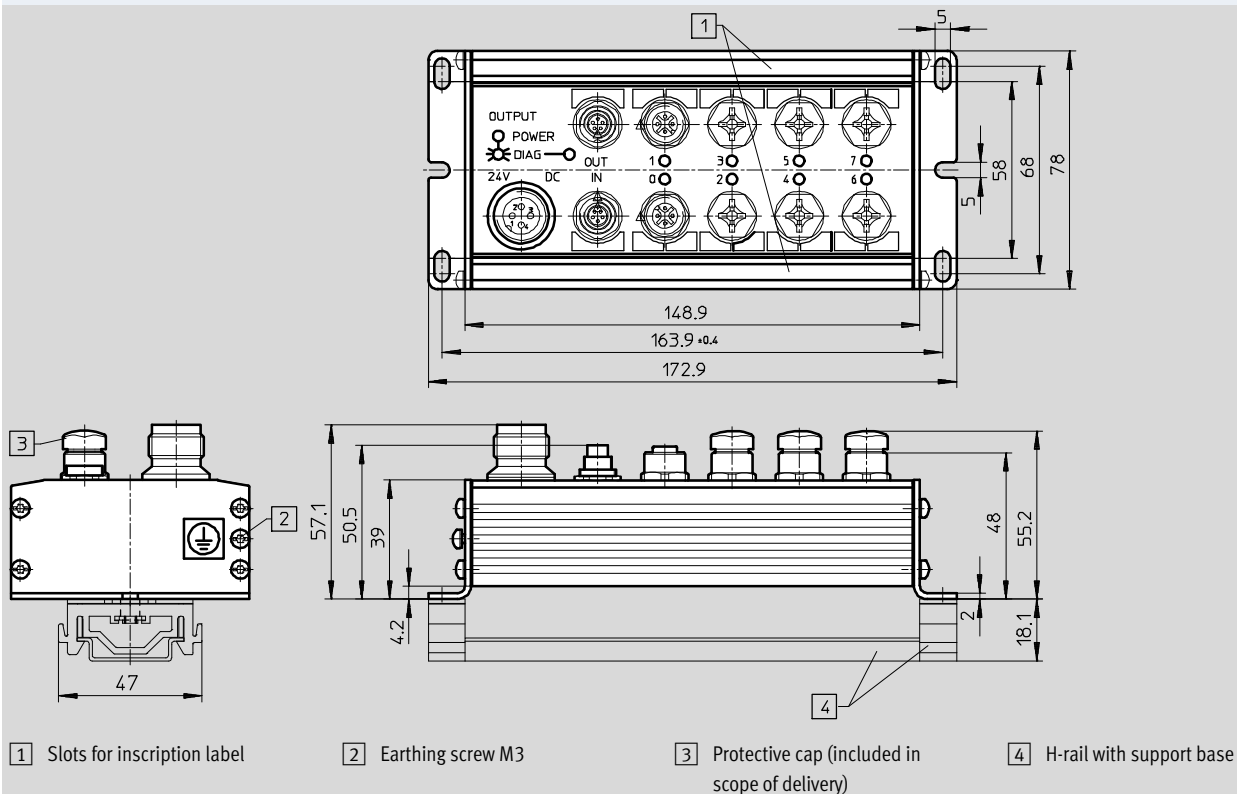
## Dimensions – Economical output module

Download CAD data ➔ **www.festo.com**

CP-A08-M12-EL-Z



| 1 | Through-hole for surface mounting |
| 2 | H-rail |
| 3 | Mounting kit for H-rail (included in the scope of delivery) |
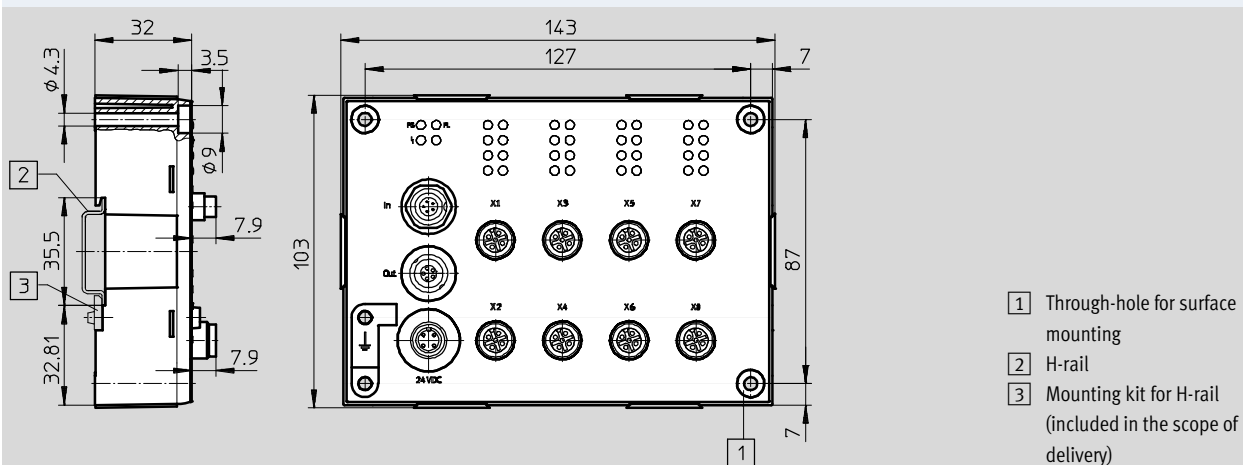
# CPI installation system
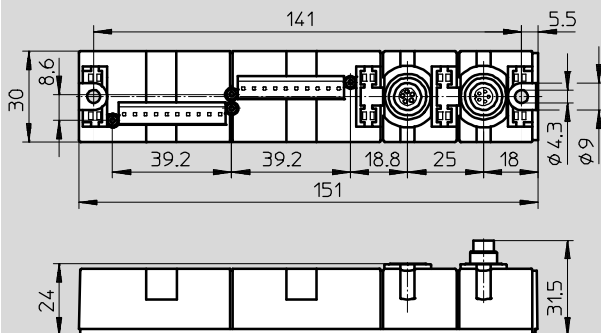
Technical data

**Dimensions – Compact CP modules**

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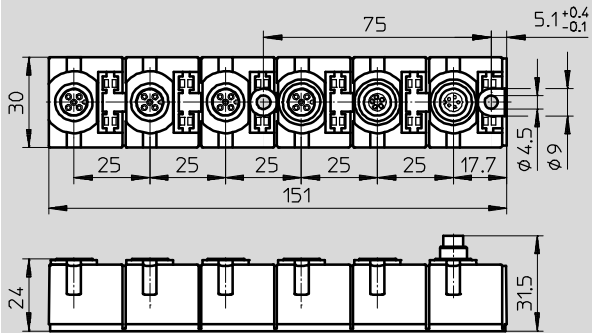


CP-E08-M8-CL
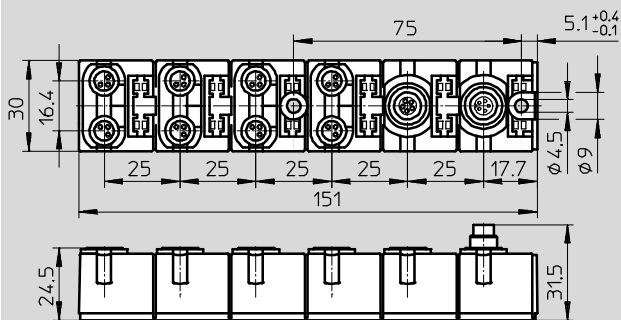


CP-E16-KL-CL

# CPI installation system

Order processing information

## Configuration guidelines

The CPI system supports a certain number of modules per CP string depending on the type of the CP

master and the CP modules connected.

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

- With CPI functionality
- Without CPI functionality

### 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 outputs can be connected to each string depending on the version

### 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 regard:

- Only one input module without CPI functionality is possible per CP string (at the end of a CP string)

- Only one CP valve terminal or output module without CPI functionality is possible per CP string (any point in the CP string)

- Free positions in the CP string can be filled by CP modules with CPI functionality (max. 4 modules)
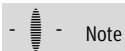
- Note

The cable length for any given string may not exceed 10 m.

Connecting cables are available in lengths of 0.25 m, 0.5 m, 2 m, 5 m and 8 m
➔ 67

The maximum number of inputs and outputs that can be connected is 32 each (sum of all CP modules on a CP string), regardless of the type of CP module (with or without CPI functionality).

## Order processing

There is one way of placing an order for the electrical CPI installation system:
- 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:
- CPV valve terminal CPV10/14/18-VI-FB-….
  ➔ Internet: cpv
- MPA-S valve terminals MPA-S-CPI-VI
  ➔ Internet: mpa-s
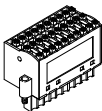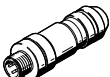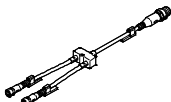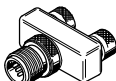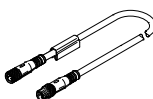- CPV-SC valve terminals CPVSC1-AE16-CPI
  ➔ Internet: cpv-sc

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
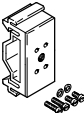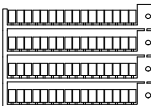
# CPI installation system

Accessories
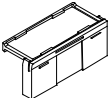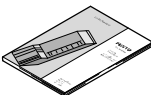
FESTO

| Ordering data | | | | | |
|---|---|---|---|---|---|
| Designation | | | | Part No. | Type |
| **Connection sets for power supply and sensors** | | | | | |
|  | Plug, screw-in tension-spring socket | 3-row, 30-pin | Without LED | **197161** | **PS1-SAC30-30POL** |
| | | 3-row, 30-pin | With LED | **197162** | **PS1-SAC31-30POL+LED** |
| **Sensor plugs** | | | | | |
|  | 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 ⌀ 2.5 … 2.9 mm | **192008** | **SEA-4GS-7-2,5** |
| | | | For 2x cable ⌀ 3 … 5 mm | **18779** | **SEA-GS-11-DUO** |
| | | | For cable ⌀ 4 … 6 mm | **18666** | **SEA-GS-7** |
| | Plug, M12, 5-pin | Screw terminal | For 2x cable ⌀ 2.5 … 5 mm | **192010** | **SEA-5GS-11-DUO** |
| | | | For cable ⌀ 4 … 6 mm | **175487** | **SEA-M12-5GS-PG7** |
| **Distributors** | | | | | |
|  | Modular system for all types of sensor/actuator distributors | | | **–** | **NEDY-…** ➜ Internet: nedy |
|  | T-plug connector | 1x plug, M8, 4-pin | 2x socket M8, 3-pin | **8005312** | **NEDY-L2R1-V1-M8G3-N-M8G4** |
| | | 1x plug connector 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 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** |
| | Connecting cable M12-M12 | 5-pin | Straight plug / straight socket | 1.5 m | **529044** | **KV-M12-M12-1,5** |
| | | | | 3.5 m | **530901** | **KV-M12-M12-3,5** |
| | Modular system for all types of connecting cable | | | | **–** | **NEBU-…** ➜ Internet: nebu |
| **Connecting cables – 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** |
|  | Connector plug for CP cable (control cabinet through-feed) | | | | **543252** | **KVI-CP-3-SSD** |

| Ordering data | | | | |
|---|---|---|---|---|
| **Designation** | | | **Part No.** | **Type** |
| **Protective caps** | | | | |
| | Cover cap for closing off unused ports (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 frame (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 manual for CPX-CP interface | German | **539293** | **P.BE-CPX-CP-DE** |
| | | 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** |

# Festo - Your Partner in Automation



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