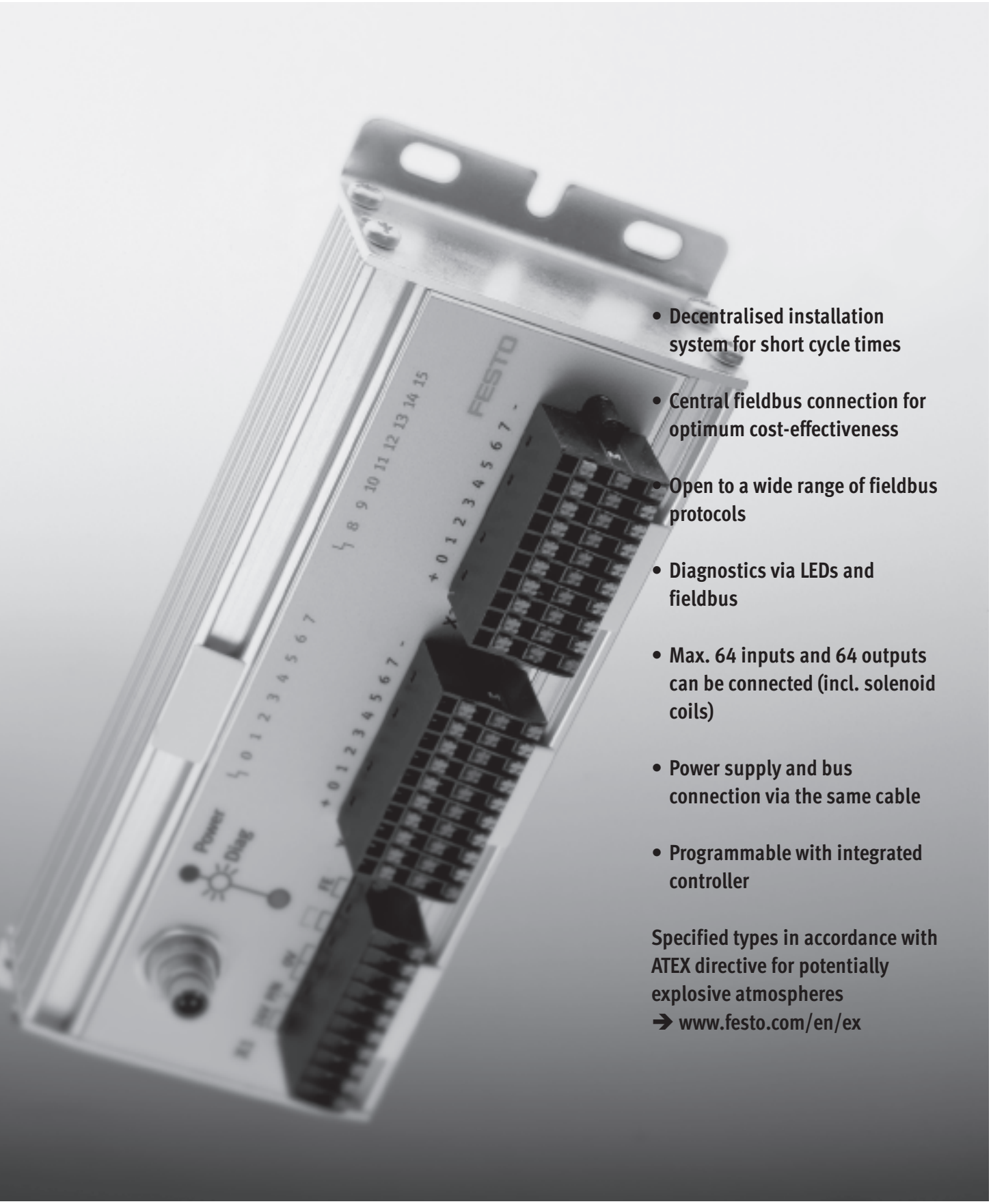
CPI installation system

FESTO

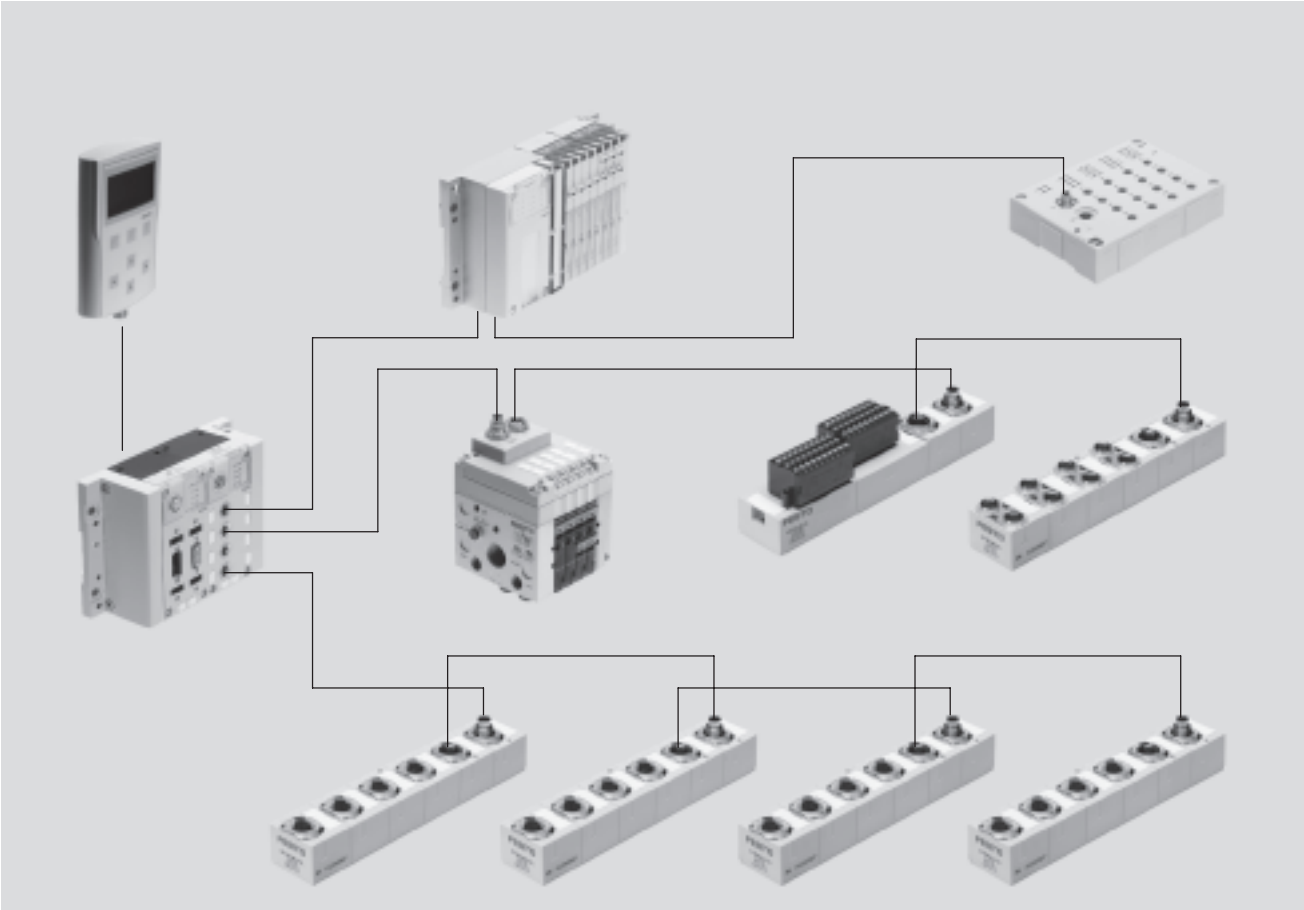


- Decentralised installation system for short cycle times
- Central fieldbus connection for optimum cost-effectiveness
- Open to a wide range of fieldbus protocols
- Diagnostics via LEDs and fieldbus
- Max. 64 inputs and 64 outputs can be connected (incl. solenoid coils)
- Power supply and bus connection via the same cable
- Programmable with integrated controller

Specified types in accordance with ATEX directive for potentially explosive atmospheres
➔ www.festo.com/en/ex

CPI installation system

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), MPA (sturdy, modular), CPV-SC (small, compact) and CPA (modular manifold sub-bases)
- 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 type 32 MPA, flow rate max. 700 l/min
  - Valve terminal type 10 CPV, flow rate max. 1,600 l/min
  - Valve terminal type 80 CPV-SC, flow rate max. 170 l/min
  - Valve terminal type 12 CPA, flow rate max. 650 l/min
- Input modules with 8 ... 32 inputs and output modules with 4 ... 8 outputs, each with or without additional power supply
- Universal electrical outputs

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, the manifold subbase valve terminal CPA and various input/output modules in a single installation concept.

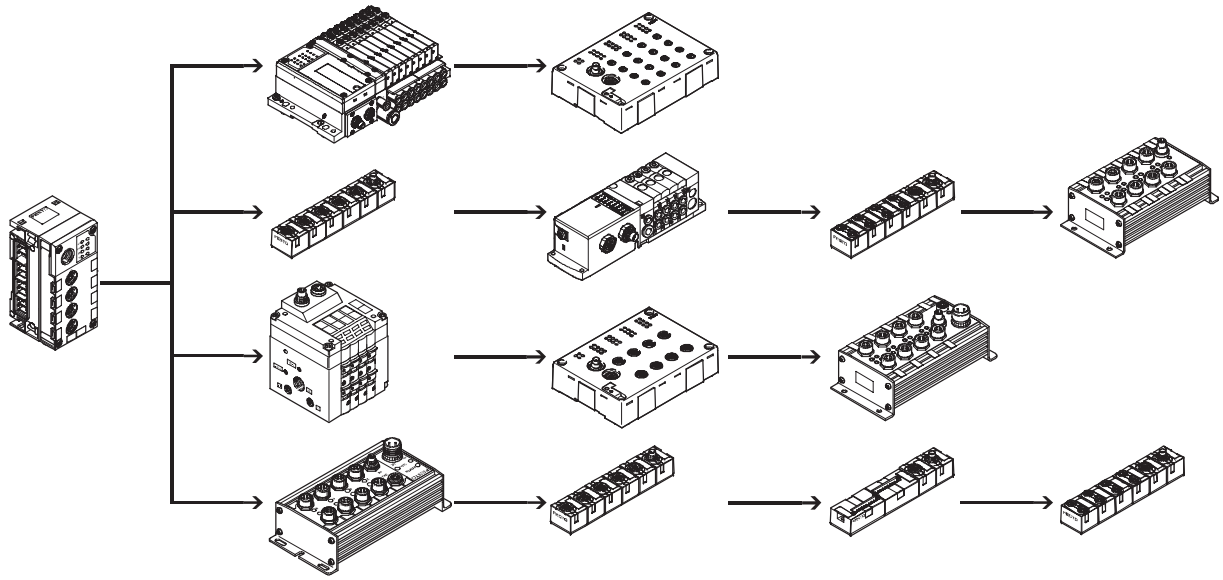
All CP valve terminals and CP modules are connected using a ready to install CP cable, and are attached to the CP interface. Four modules, for example one CPV valve terminal and one to three CP input modules, make up an installation string that ends at the CP interface.

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.

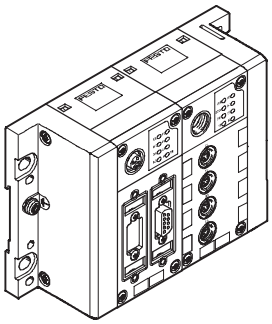


CPI installation system

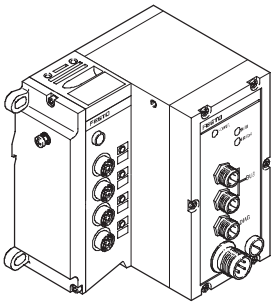
Key features

Node types:

Fieldbus/control block
CPX with CP interface
CPX-...

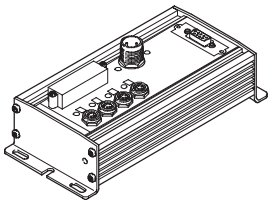


Fieldbus/control block
Type 03/04 with CP interface
ISF3-03

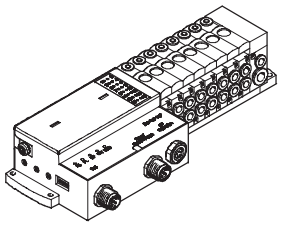


CP fieldbus node

CP-E



Valve terminal
with CP string extension
CPV, CPA-SC, CPV-SC, CDVI-DN, MPA

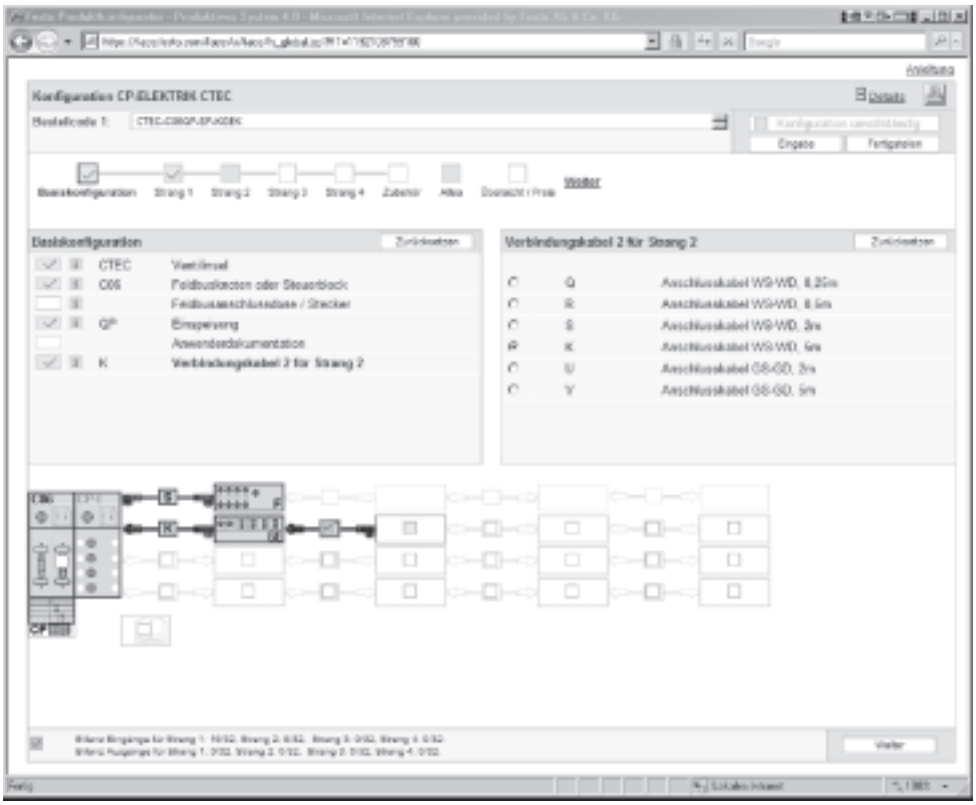


Configurator **Online via:** ➔ www.festo.com/en/engineering

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
➔ 4 / 4.6-88



The illustration above provides an example of a configuration.
The following steps explain how you arrive at the order code:

Once you have called up the Festo home page (www.festo.com), click on "Automation" and select the "Catalogue" from the "Products" submenu; this will take you directly to the home page of the catalogue. Then select "Control systems / bus systems / electrical peripherals". Under the heading "Electrical terminals", click on the link "For valve terminals type 10 CPV, type 12 CPA". Select the required individual components or the entire system (type "CTEC").
Once you have added your selection to the basket, you can configure the CPI system step by step (from left to right) according to your requirements.

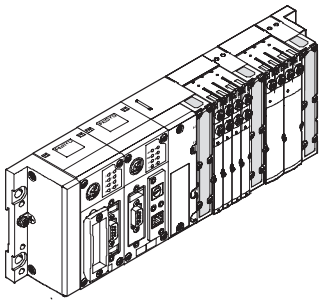
CPI installation system

Peripherals overview

FESTO

Integration of the CPI installation system in various connection concepts

Centralised pneumatic connection (valve terminal)



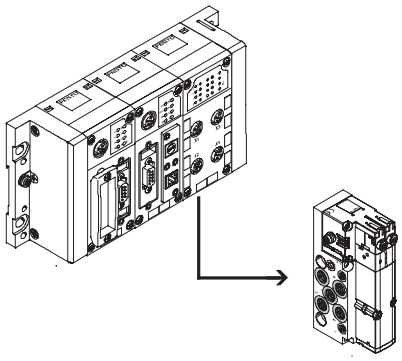
Advantages

- 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

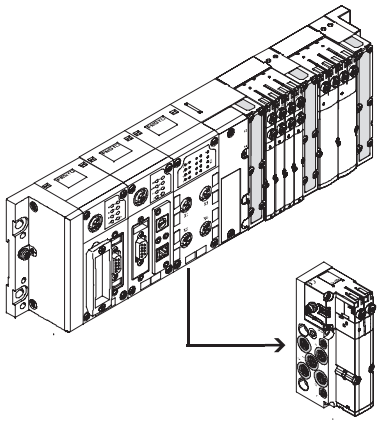
- Air supply per valve requires more tubing
- Serial electrical interlinking not advisable/possible
- More complex electrical installation

CPI installation system

Peripherals overview

Integration of the CPI installation system in various connection concepts

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



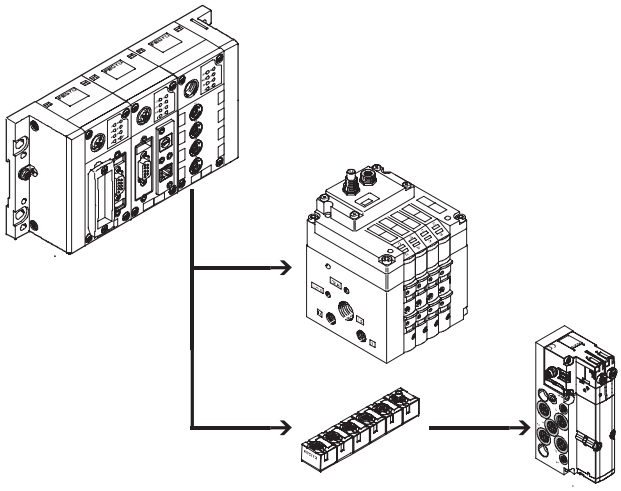
Advantages

- 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)

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

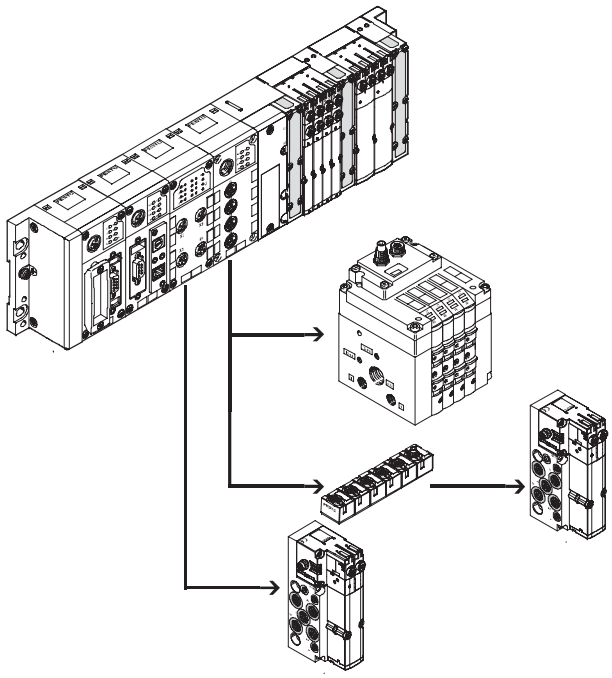
- Limited spatial expansion possible (CPI system up to 10 m, AS-interface up to 100 m)
- High installation costs

CPI installation system

Peripherals overview

Integration of the CPI installation system in various connection concepts

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

Fieldbus 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 fieldbus systems.

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

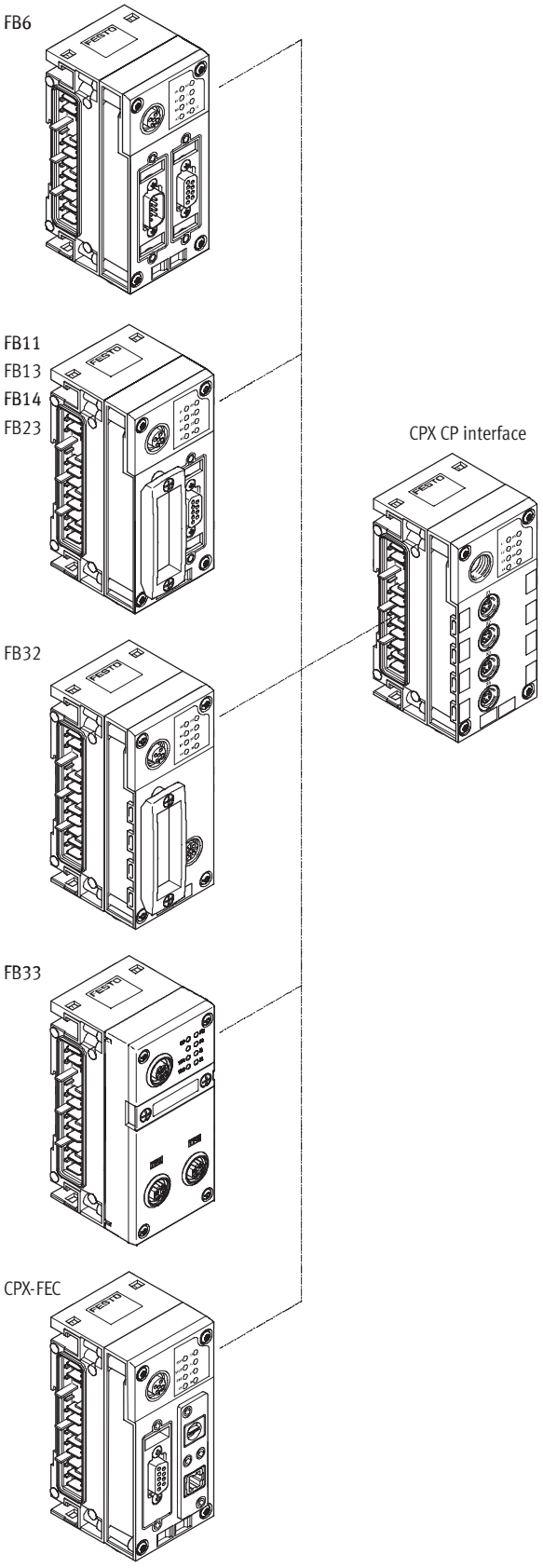
Control block

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

- Ethernet
- TCP/IP
- Web

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

Overview



Bus protocol/fieldbus node	Special features
Interbus	
FB6	• Up to 96 digital inputs/outputs • 6 analogue inputs/outputs
DeviceNet	
FB11	• Up to 512 digital inputs/outputs • 18 analogue inputs/outputs
Profibus DP	
FB13	• Up to 512 digital inputs/outputs • 18 analogue inputs/outputs
CANopen	
FB14	• Up to 64 digital inputs and 64 digital outputs • 8 analogue inputs and 8 analogue outputs
CC-Link	
FB23	• Up to 64 digital inputs/outputs • 16 analogue inputs/outputs
Ethernet/IP	
FB32	• Up to 128 digital inputs/outputs • 8 analogue inputs/outputs
PROFINET RT	
FB33	• Up to 512 digital inputs/outputs • 32 analogue inputs/outputs
Control block FEC	
• Modbus TCP • Easy-IP • Interbus, DeviceNet, Profibus DP, CANopen and CC-Link via combination with CPX fieldbus node • TCP/IP and web connection via Ethernet interface	• Up to 512 inputs/outputs • Several CP interfaces can be connected • Ethernet fieldbus slave in remote I/O operating mode (T05) • Autonomous control of the CPI system as a remote controller (T03)

Connection of modules in the CPI installation system

CP interface within the context of the CPX terminal

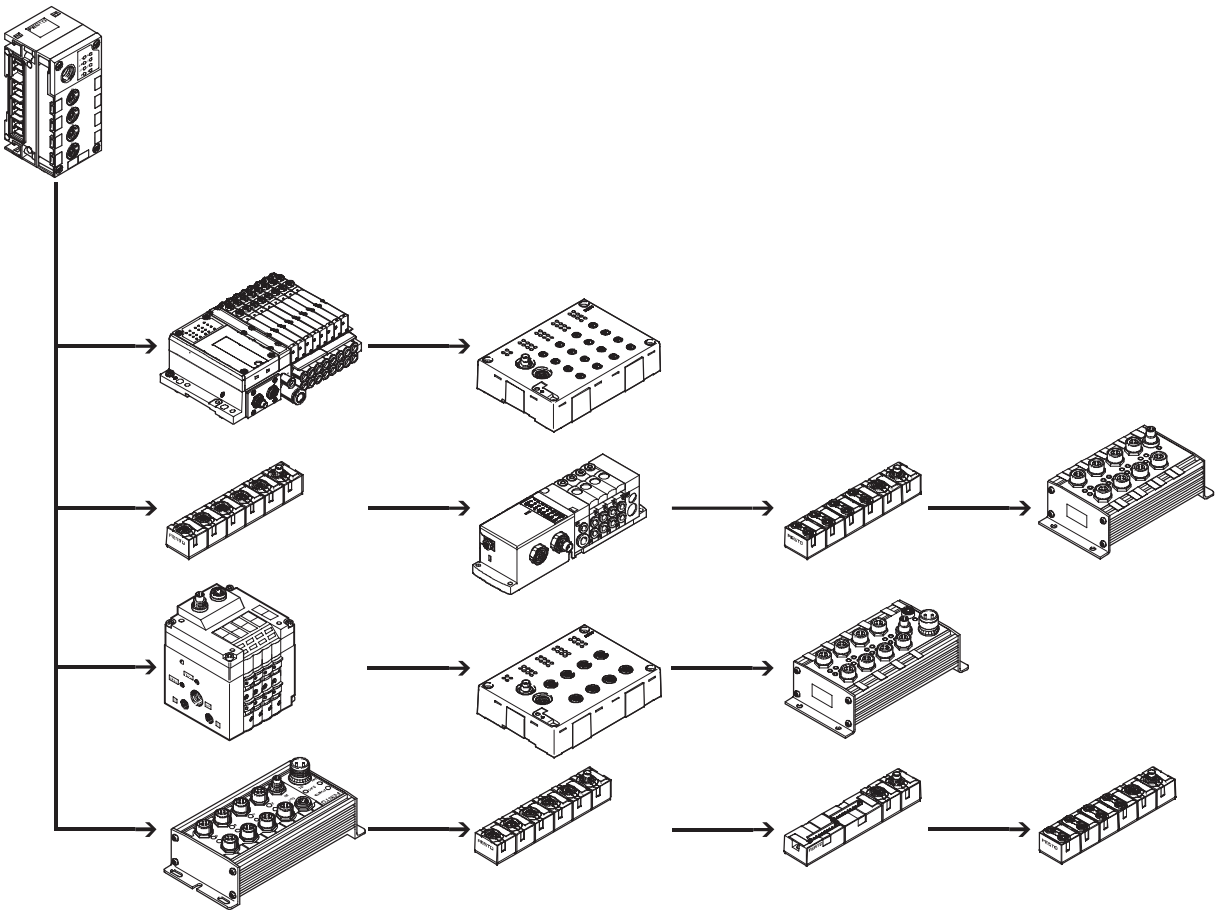
Using the CP interface as a module of the CPX terminal facilitates the progression from the CP system to the CPI system.
All CP modules are both downwards and upwards compatible and can therefore be used in the CP system and in the CPI system.

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 fieldbus node and the CPX-FEC:

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



CPI installation system

Connection options

FESTO

Fieldbus Direct

Special feature

The Fieldbus Direct product range is the most compact way of connecting valves to a fieldbus. The fieldbus 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 nine different fieldbus standards. The most important fieldbus 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, CPA-SC, CDVI and MPA valves are described in detail in

➔ 4 / 3.1-2 Valve terminal CPV-SC
➔ 4 / 3.1-28 Valve terminal CPA-SC
➔ 4 / 3.4-2 Valve terminal CDVI
➔ 4 / 2.1-2 Valve terminal CPV
➔ 4 / 4.7-2 Fieldbus Direct

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 fieldbus node.

- A CP string of the CP system is integrated in the fieldbus node as an extension
- Different input and output modules as well as CPV, CPA and MPA 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:

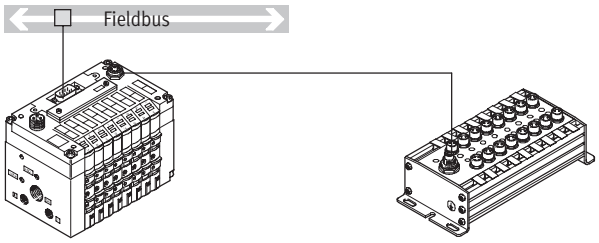
- Max. 32 input signals
- Max. 32 output signals for output modules 24 V DC or solenoid coils
- Logic and sensor supply for the input modules
- Load voltage supply for the valve terminals
- Logic supply for the output modules

CPI installation system

Connection options

Fieldbus Direct with CP string extension

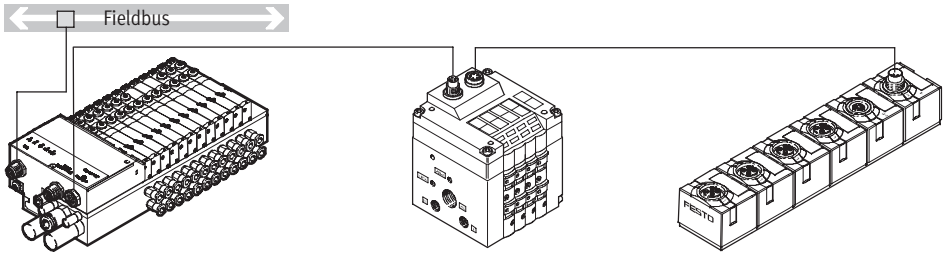
CPV valve terminal



- 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
➔ 4 / 4.7-2

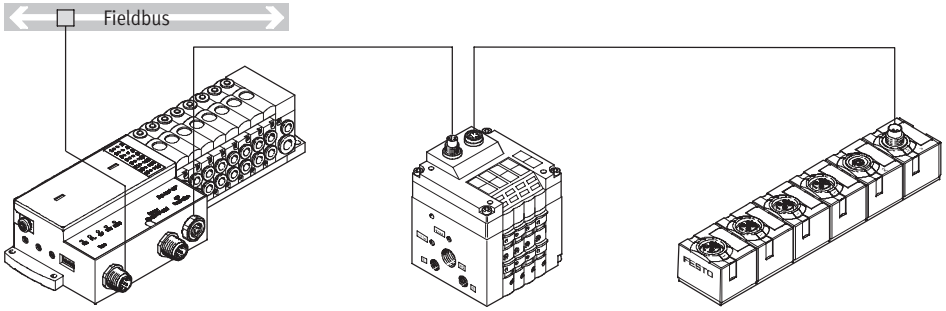
CPA-SC



- 4 to 24 valve positions
- DeviceNet connection
- Profibus DP
- 4 to 32 solenoid coils

Further information
➔ 4 / 3.1-28

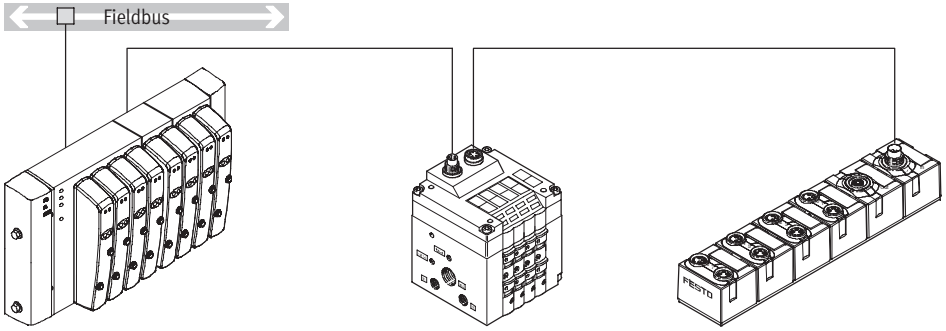
CPV-SC



- 4 to 16 valve positions
- DeviceNet connection
- Profibus DP
- 4 to 16 solenoid coils

Further information
➔ 4 / 3.1-2

CDVI-DN



- 4, 6, 8 or 12 valve positions
- DeviceNet connection
- 4 to 24 solenoid coils

Further information
➔ 4 / 3.4-2

CPI installation system

Connection options

FESTO

Positioning systems

Application

The SPC200 is a position controller (closed loop) and positioning control (open loop) in one. Together with the drive, the displacement encoder and the proportional directional control valve, it forms a closed control loop.

The CP interface option enables the functions and components of the CP installation system to be used.

Properties

- Modular with 9 different plug-in cards
- Wide variety with up to 4 positioning axes, stepper motor axes and the option of operating pneumatic and electrical systems
- Flexible with set selection for positioning tasks with fixed trajectories and program mode with up to 100 programs
- Quick commissioning using the WINPISA diagnostic and programming tool

Positioning systems and CP interface

The plug-in cards for connecting the axis strings facilitate the connection of further input/output modules:

- One CP string of the CP system is possible as an extension
- Various input and output modules as well as CPV valve terminals can be connected

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

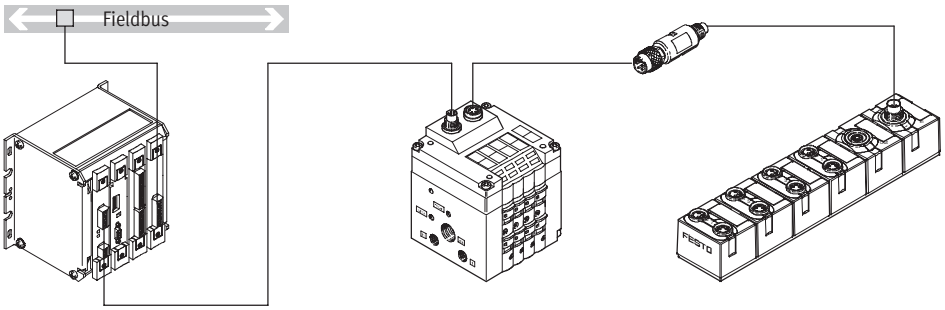
The CP string interface offers:

- 16 input signals
- 16 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

Note

CP input modules can only be connected via a terminating resistor (KZW-M9-R100).

Axis controller SPC200 with CP interface

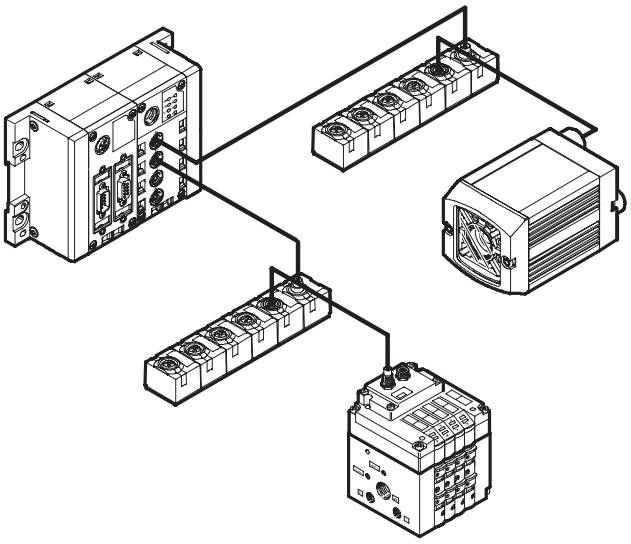


- Max. 64 inputs and 64 outputs via fieldbus
- DeviceNet, Interbus or Profibus connection

Further information

➔ Volume 5

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.
In combination with a CPX-CPI module and a CPX fieldbus, for example, the camera can be accessed via Profibus DP, Interbus, DeviceNet, CANopen and CC-Link.

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

Further information

➔ Volume 8

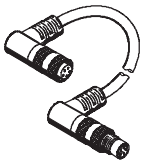
CPI installation system

Connection options

FESTO

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
➔ 4 / 5.1-88

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

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

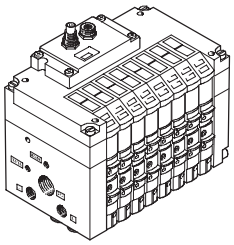
- M12-5PIN
- M8-3PIN
- M8-4PIN
- Spring-loaded terminal or screw terminal technology

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 with 2 ... 32 valves
- CPV-SC with 4 ... 16 valves
- CPA with 2 ... 16 valves

Valve terminals with CP interface

CPV valve terminal

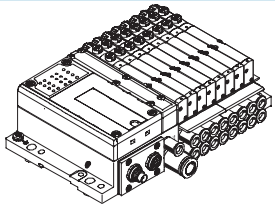


CPV10
CPV14
CPV18

- 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
➔ 4 / 2.1-2 Valve terminal CPV

MPA valve terminal

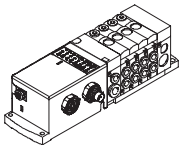


MPA1
MPA2

- Max. 32 valves
- Modular and versatile
- Width 10, 20 mm
- Nominal flow rate 360/700 l/min
- CPI functionality

Further information
➔ 4 / 2.2-1 Valve terminal MPA

CPV-SC valve terminal

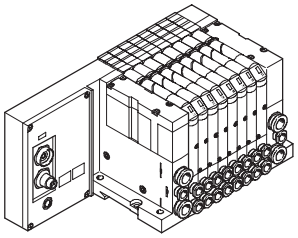


CPV-SC

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

Further information
➔ 4 / 3.1-1 Valve terminal CPV-SC

CPA valve terminal



CPA10
CPA14

- Max. 16 valves
- Width 10, 14 mm
- Nominal flow rate 300/600 l/min
- CP functionality

Further information
➔ 4 / 2.1-90 Valve terminal CPA

Connection of input and output modules in the CPI installation system

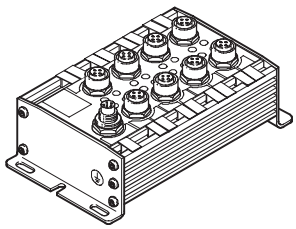
Special features of the CP input/output modules of sturdy design

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.

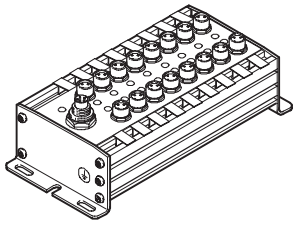
CP input modules of sturdy design



CP-E16-M12x2-5POL
CP-E16N-M12x2-5POL

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

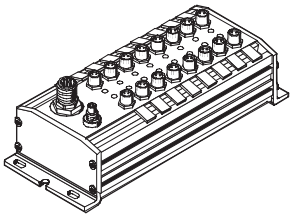
- M12 plug, double allocation
- 1x M9 CP connection
- PNP/NPN, IP65



CP-E16-M8
CP-E16N-M8

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

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

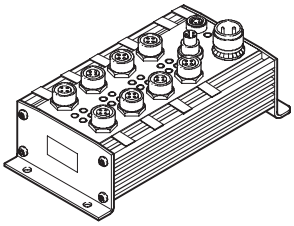


CP-E16-M8-Z

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

- Galvanic isolation through additional power supply
- M8 plug, single allocation
- 1x M9 CP connection
- Separate sensor supply
- PNP/NPN, IP65

CP output modules of sturdy design



CP-A08-M12-5POL
CP-A08N-M12

- 8 outputs 24 V DC
- Output signal display via 8 LEDs
- Operating status display
- M12 plug, single allocation
- CP functionality

- 2x M9 CP connection
- Separate load voltage
- Outputs resistant to overloads and short circuits
- PNP/NPN, IP65

CPI installation system

Key features – Input/output modules

Connection of input and output modules in the CPI installation system

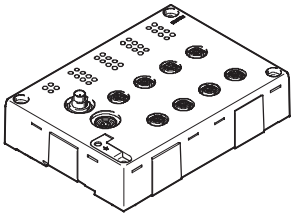
Special features of the CP input/output modules of economical design

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, CPV-SC, CPA-SC, CDVI, CPA

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

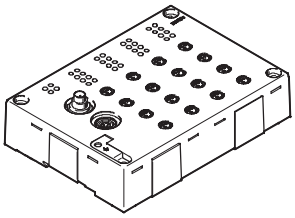
CP input modules of economical design



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

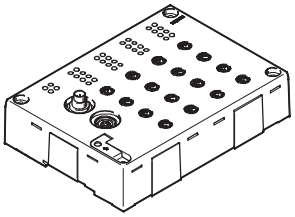
- 8x M12 plug, 5-pin, double allocation
- 2x M9 CP connection
- PNP, IP65



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

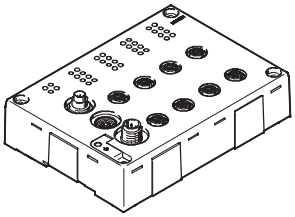


CP-E32-M8-EL

- 32 inputs 24 V DC
- Signal status display via 32 LEDs
- Operating status display (per module)
- CPI functionality

- 16x M8 plug, 4-pin, double 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

FESTO

Connection of input and output modules in the CPI installation system

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

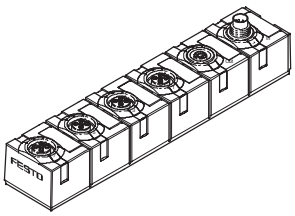
In addition to the sturdy and economical CP input/output modules, there is also the compact series of CP input/output modules. These have an optimised, compact design, are made from plastic and are very light. They are, of course, available with the high degree of protection IP65/67 (exception: terminal 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, CPV-SC, CPA-SC, CDVI, CPA

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

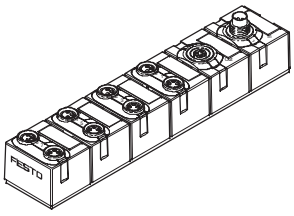
CP input modules of compact design



CP-E08-M12x2-CL

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

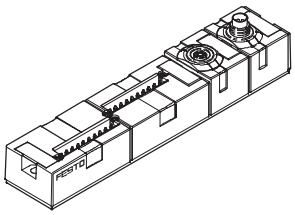
- 4x M12 plug, 5-pin, double allocation
- 2x M9 CP connection
- PNP, IP65/67



CP-E08-M8-CL

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

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

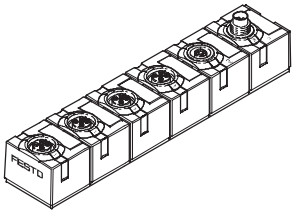


CP-E16-KL-CL

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

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

CP output modules of compact design



CP-A04-M12x2-CL

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

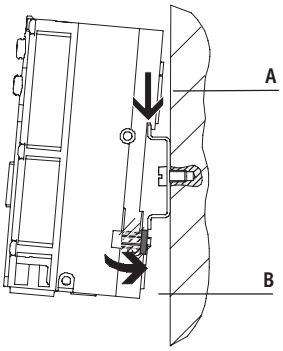
- 4x M12 plug, 5-pin, double allocation
- 2x M9 CP connection
- Outputs resistant to overloads and short circuits
- PNP, IP65/67

CPI installation system

Key features – Mounting options

H-rail mounting

CP interface



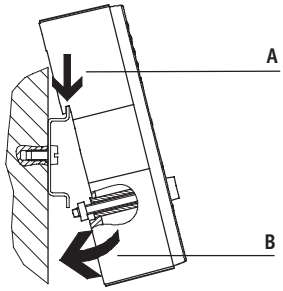
The H-rail mounting is formed in the reverse profile of the CPX interlinking blocks. The CPX terminal can be attached to the H-rail using the H-rail mounting.

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):
- CPA-BG-NRH

This enables mounting on H-rails to EN 60715.

Economical CP modules



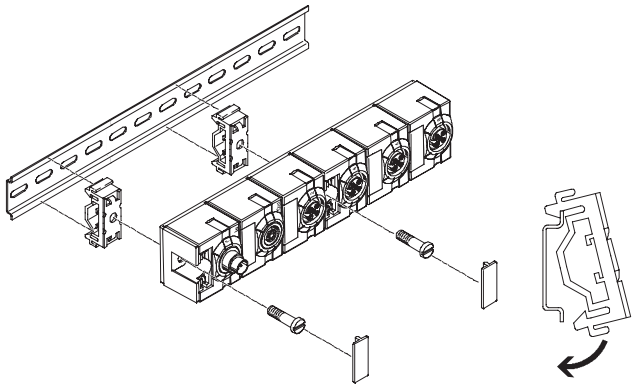
The H-rail mounting is impressed in the reverse profile of the economical CP modules. The modules can be attached to the H-rail using the H-rail mounting.

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



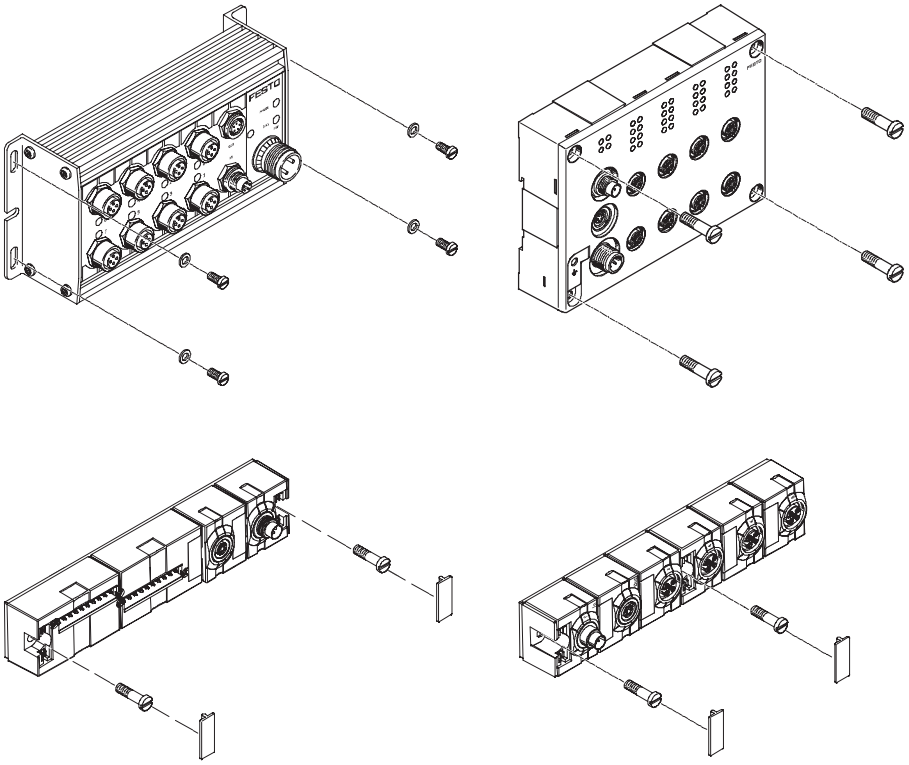
For the CP modules there is a mounting kit that can be used on an H-rail. On the compact CP modules, the mounting holes are covered by inscription labels.

The following mounting kit is required for H-rail mounting:
- CP-TS-HS35

This enables mounting on H-rails to EN 60715.

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.

Inscription system

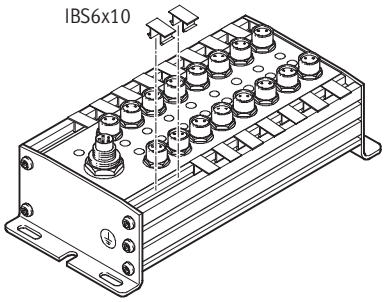
All CP modules have holders for inscription labels.

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

IBS6x10

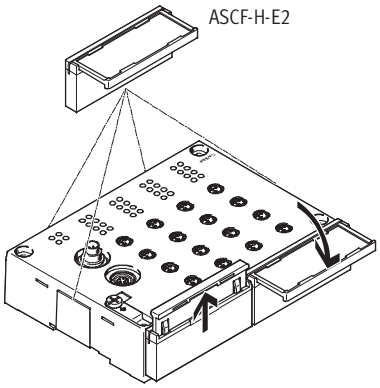


The sturdy CP modules have two slots in which the inscription labels IBS6x10 (Part No. 18 576) can be fitted. At least one inscription label can be fitted per connection.

The IBS6x10 are plastic clips that can be printed on, written on or affixed with labels.

Economical CP modules

ASCF-H-E2

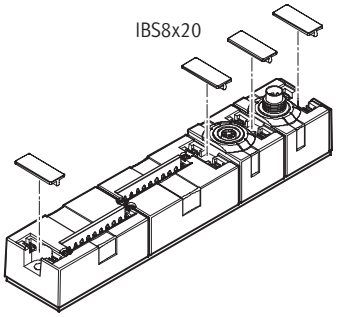


The economical CP modules have six lateral fixtures for one inscription label holder ASCF-H-E2 each (Part No. 547 473).

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

IBS8x20



The compact CP modules have a holder for an inscription label IBS8x20 (Part No. 539 388) for each connection.

The IBS8x20 are plastic clips that can be printed on, written on or affixed with labels.

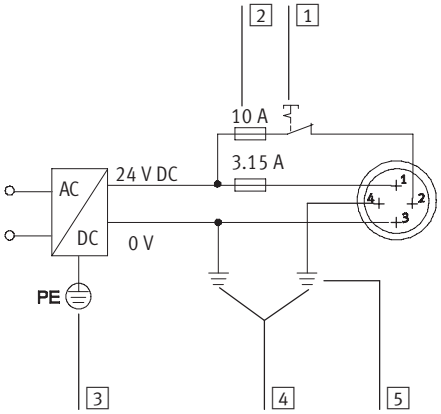
Operating voltage and load current supply

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

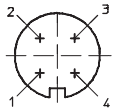
Every module in the CPI system is protected separately against overload with electronic fuses.
The input modules without additional supply provide a maximum sensor supply of 500 mA in the sturdy design, 800 mA in the compact design and 700 mA in the economical design with 16 inputs and 1400 mA with 32 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



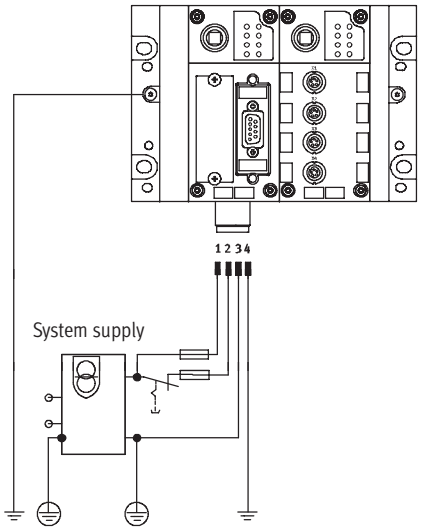
1 Load voltage supply (can be disconnected separately)
2 External fuses
3 Protective earth
4 Equipotential bonding
5 Earth terminal on pin 4, rated for 12 A

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)



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 socket.

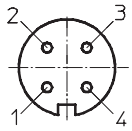
A distinction is made between supply for
- electronics and sensors/inputs
- valves
- actuators/outputs

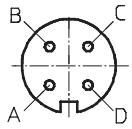
Selectable connecting thread:
- M18
- 7/8"

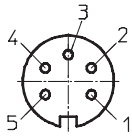
Note

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.

Pin allocation of plug for additional power supply

Pin allocation for M18 – 4-pin	Pin	Signal	Designation
	1	24 V DC	Supply voltage for electronics and inputs
	2	24 V DC	Load voltage supply for valves and outputs
	3	0 V	Neutral conductor
	4	FE	Earth terminal

Pin allocation for 7/8" – 4-pin	Pin	Signal	Designation
	A	24 V DC	Supply voltage for electronics and inputs
	B	24 V DC	Load voltage supply for valves and outputs
	C	FE	Earth terminal
	D	0 V	Neutral conductor

Pin allocation for 7/8" – 5-pin	Pin	Signal	Designation
	1	0 V	Neutral conductor for valves and outputs
	2	0 V	Neutral conductor for electronics and sensors
	3	FE	Earth terminal
	4	24 V DC	Supply voltage for electronics and inputs
	5	24 V DC	Load voltage supply for valves and outputs

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

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.

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 CPX-MMI and then evaluated and edited.

Diagnostics via LED

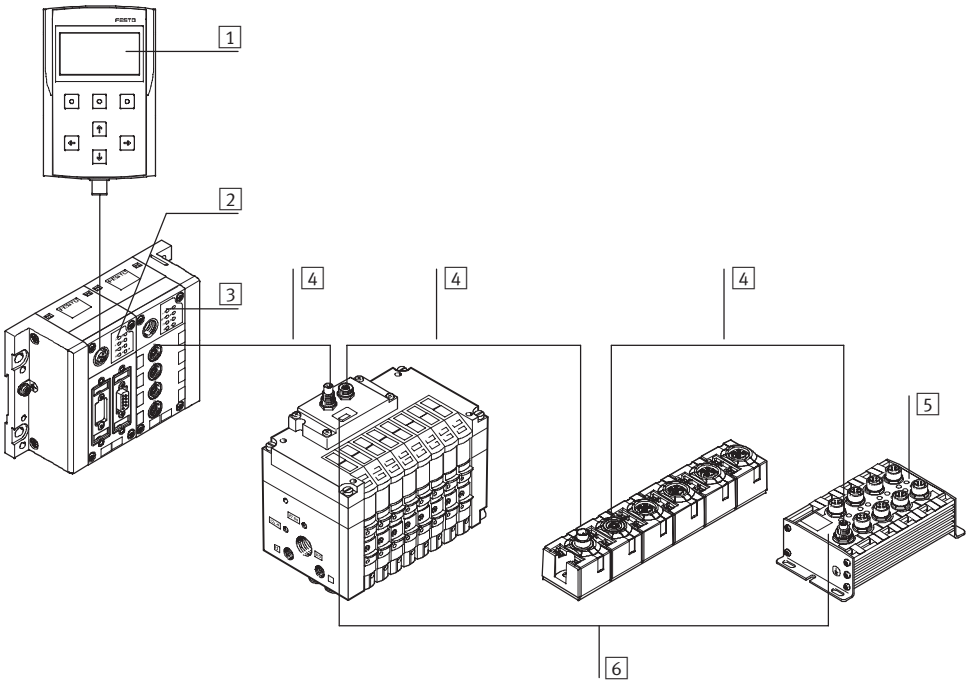
- Error in bus communication
- POWER, power supply display for internal electronics
- POWER V, load voltage display for valves
- 0 ... 3, CP string allocation changed or interrupted

There are also bus-specific LED displays.

Diagnostics via control program/CPX-MMI

- 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)

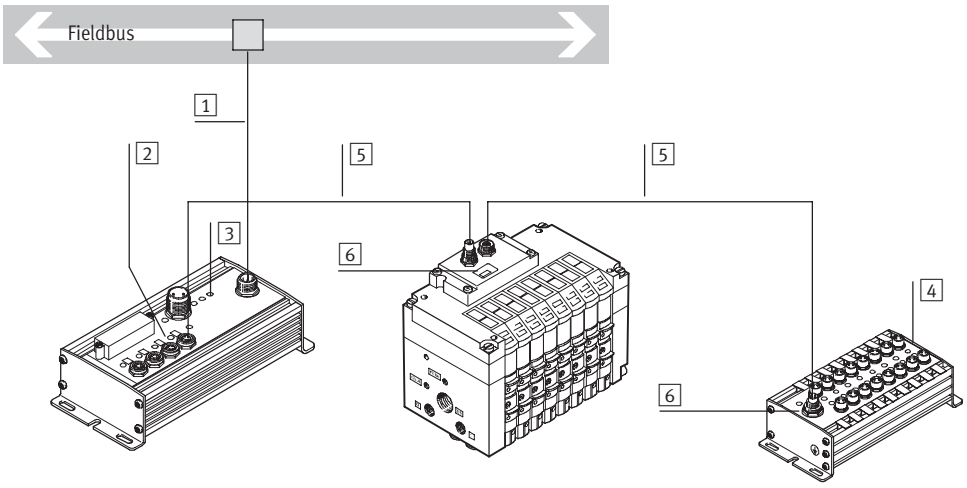
Diagnostics via CPX terminal



1 Diagnostics via controller/fieldbus 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

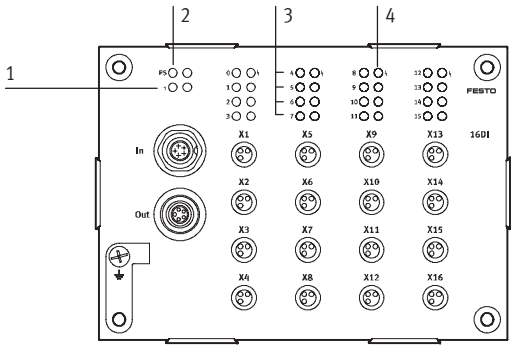
Diagnostics

Diagnostics via CP fieldbus node



1 Diagnostics via fieldbus
2 String diagnostics via LED on the fieldbus node
3 Bus-specific LED
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 circuit/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 fieldbus node or CPX-FEC 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.

CPI installation system

Selection aid

FESTO

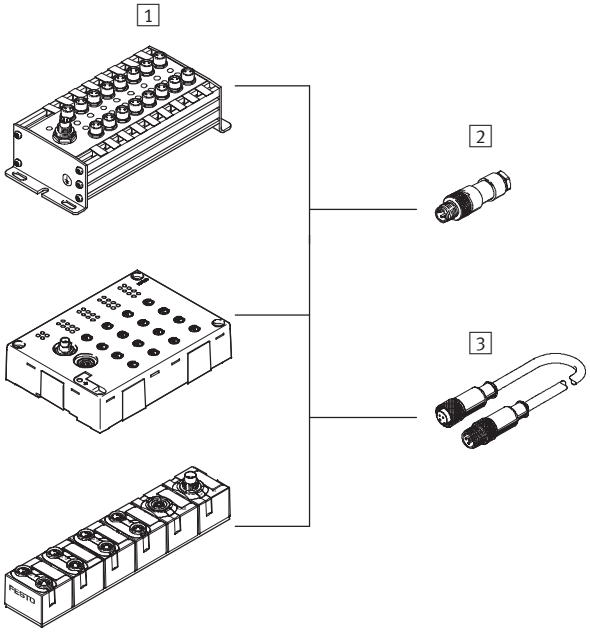
System selection aid					
	Modules per string	Outputs/inputs per string	Modules with CP functionality	Modules with CPI functionality	String length [m]
CP system	2	16/16	0 ... 1 input module 0 ... 1 output module	0 ... 1 input module 0 ... 1 output module	0 ... 10
CPI system	4	32/32	0 ... 1 input module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

Module selection aid							
	Functionality		Additional power supply	Address requirement		Max. current consumption	→ Page
	CP	CPI		Inputs	Outputs	[A]	
Input modules							
CP-E16-M8	■	–	–	16	–	0.54	4 / 4.6-47
CP-E16N-M8	■	–	–	16	–	0.59	4 / 4.6-47
CP-E16-M12x2-5POL	■	–	–	16	–	0.59	4 / 4.6-47
CP-E16N-M12x2	■	–	–	16	–	0.59	4 / 4.6-47
CP-E16-M8-Z	■	–	■	16	–	1.04	4 / 4.6-47
CP-E32-M8-EL	–	■	–	32	–	1.4	4 / 4.6-53
CP-E16-M8-EL	■	■	–	16	–	0.7	4 / 4.6-53
CP-E16-M12-EL	■	■	–	16	–	0.7	4 / 4.6-53
CP-E08-M12-CL	■	■	–	8	–	0.835	4 / 4.6-59
CP-E08-M8-CL	■	■	–	8	–	0.835	4 / 4.6-59
CP-E16-KL-CL	■	■	–	16	–	0.835	4 / 4.6-59
Output modules							
CP-A08-M12-5POL	■	–	■	–	8	2.09	4 / 4.6-65
CP-A08N-M12	■	–	■	–	8	2.09	4 / 4.6-65
CP-A08-M12-EL-Z	■	■	■	–	8	4	4 / 4.6-69
CP-A04-M12-CL	■	■	–	–	4	1.035	4 / 4.6-73
Connecting cables							
KVI-CP-3-...	■	■	–	–	–	1.6	4 / 5.1-88
Valve terminals							
CPV10-FB-4	■	■	–	–	16	0.327	4 / 2.1-1
CPV10-FB-6	■	■	–	–	16	0.465	4 / 2.1-1
CPV10-FB-8	■	■	–	–	16	0.604	4 / 2.1-1
CPV14-FB-4	■	■	–	–	16	0.419	4 / 2.1-1
CPV14-FB-6	■	■	–	–	16	0.603	4 / 2.1-1
CPV14-FB-8	■	■	–	–	16	0.788	4 / 2.1-1
CPV18-FB-4	■	■	–	–	16	0.624	4 / 2.1-1
CPV18-FB-6	■	■	–	–	16	0.911	4 / 2.1-1
CPV18-FB-8	■	■	–	–	16	1.197	4 / 2.1-1
CPA10	■	–	–	–	16	0.31	4 / 2.1-89
CPA14	■	–	–	–	16	0.5	4 / 2.1-89
MPA	–	■	■	–	32	3.25	4 / 2.2-1
CPV-SC	–	■	–	–	16	0.875	4 / 3.1-1

FESTO

Accessory selection aid

Connection M8, 3-pin



Note

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

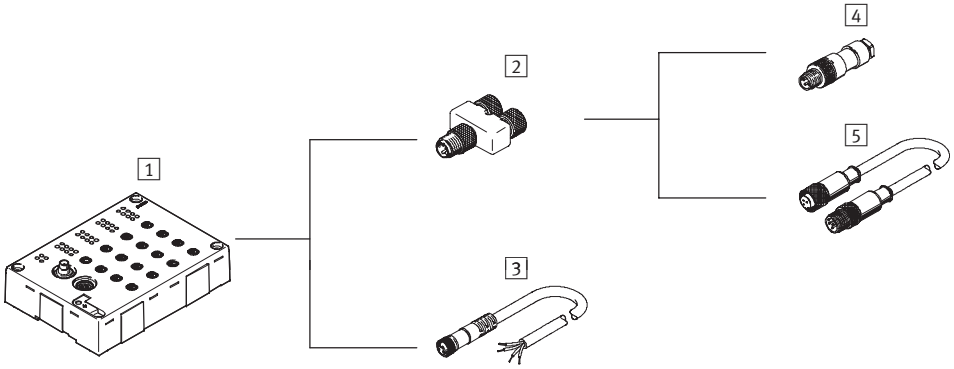
- application tailored
- perfectly fitting
- installation saving

1 Input modules
Type
CP-E16-M8
CP-E16N-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	
KM8-M8-GSGD-...	Socket M8, 3-pin
NEBU-...-M8G3	Socket M5, 3-pin
	Socket M8, 3-pin
	Socket M8, 4-pin
	Socket M12, 5-pin
	Open cable end

Accessory selection aid

Connection for inputs M8, 4-pin



- Note

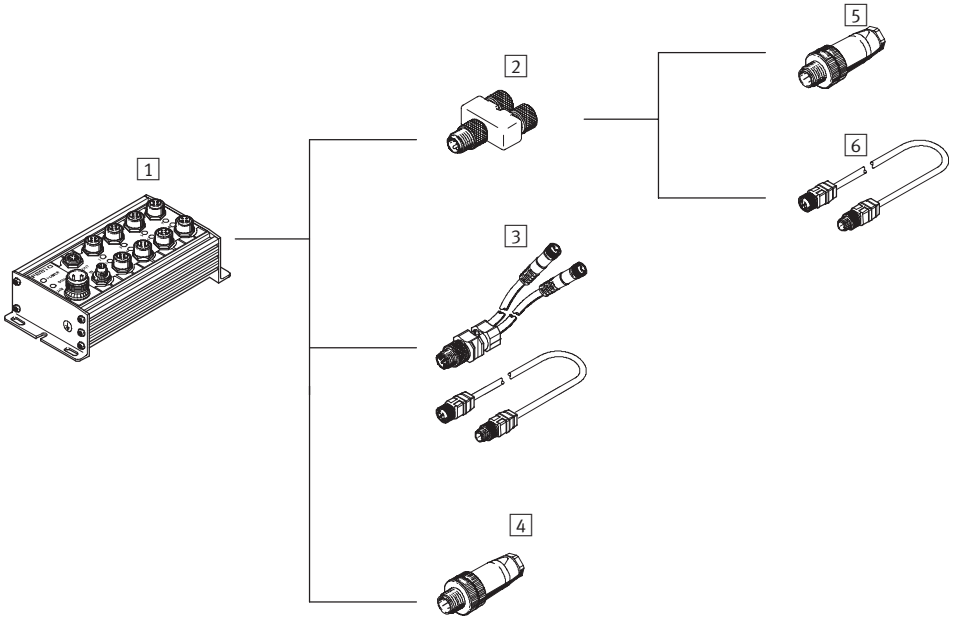
Festo delivers pre-assembled M8/M12 connecting cables (NEBU modular system) on customer request:

- application tailored
- perfectly fitting
- installation saving

1 Input modules	Plug connector/connecting cable		Plug connector/connecting cable		
Type	Type	Connection technology	Connection technology	Type	Connection technology
CP-E32-M8-EL	2 T-adapter		4 Plug connector		
	NEDU-M8D3-M8T4	2x socket M8, 3-pin	Plug M8, 3-pin	SEA-GS-M8	Solder lug
			Plug M8, 3-pin	SEA-3GS-M8-S	Screw terminal
	3 Connecting cable		5 Connecting cable		
	NEBU-...-M8G4	Socket M5, 3-pin	Plug M8, 3-pin	KM8-M8-GSGD-...	Socket M8, 3-pin
		Socket M8, 3-pin	Plug M8, 3-pin	NEBU-...-M8G3	Socket M5, 3-pin
		Socket M8, 4-pin			Socket M8, 3-pin
		Socket M12, 5-pin			Socket M8, 4-pin
		Open cable end			Socket M12, 5-pin
					Open cable end

Accessory selection aid

Connection for inputs M12, 4-pin



- Note

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

- application tailored
- perfectly fitting
- installation saving

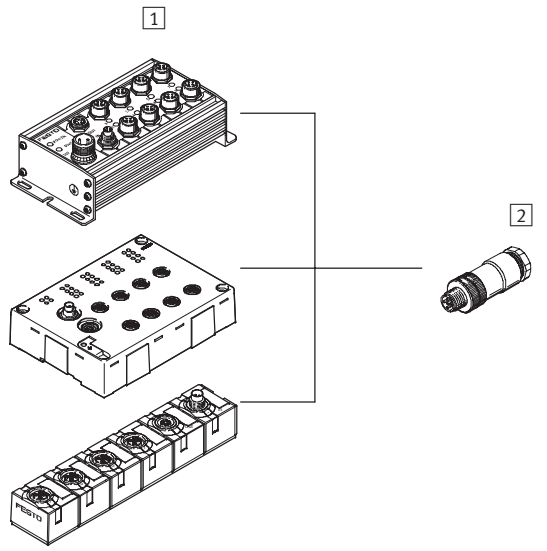
1 Input modules
Type
CP-E16N-M12x2

Plug connector/connecting cable	
Type	Connection technology
2 T-adapter	
NEDU-M12D5-M12T4M	2x socket M12, 4-pin
3 Connecting cable	
KM12-DUO-M8-...	2x socket M8, 3-pin
KM12-M12-...	Socket M12, 4-pin
4 Plug connector	
SEA-GS-7	Screw terminal
SEA-4GS-7-2,5	Screw terminal
SEA-GS-11-DUO	Screw terminal

Plug connector/connecting cable		
Connection technology	Type	Connection technology
5 Plug connector		
Plug M12, 4-pin	SEA-GS-7	Screw terminal
Plug M12, 4-pin	SEA-4GS-7-2,5	Screw terminal
6 Connecting cable		
Plug M12, 4-pin	KM12-M12-...	Socket M12, 4-pin

Accessory selection aid

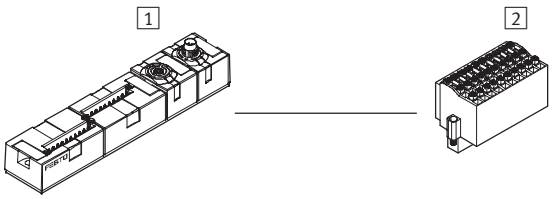
Connection for inputs M12, 5-pin



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

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

Connection for inputs, tension-spring socket

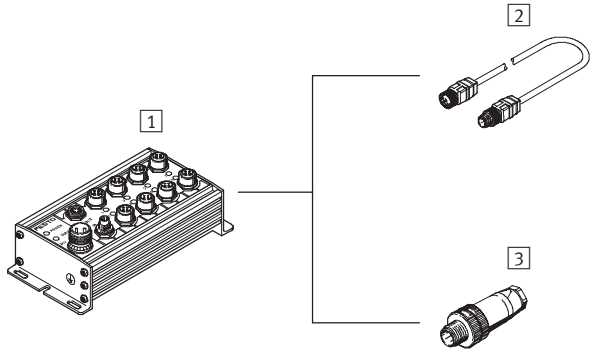


1 Input modules
Type
CP-E16-KL-CL

2 Plug connector	
Type	Connection technology
PS1-SAC31-30POL+L ED	Screw-in tension-spring socket

Accessory selection aid

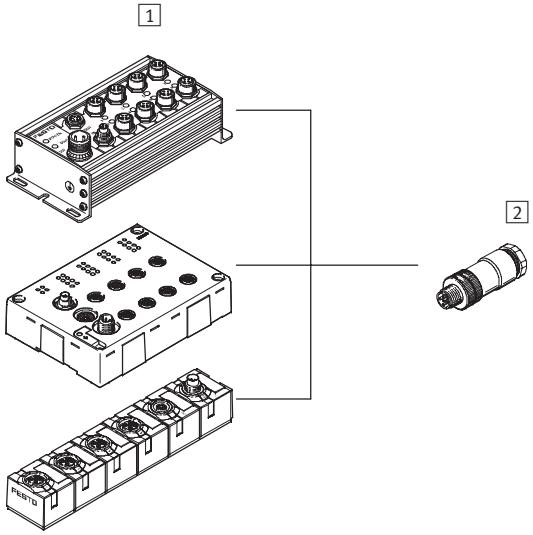
Connection for outputs M12, 4-pin



1 Output modules
Type
CP-A08N-M12

Plug connector/connecting cable	
Type	Connection technology
2 Connecting cable	
KM12-M12-...	Socket M12, 4-pin
3 Plug connector	
SEA-GS-7	Screw terminal
SEA-4GS-7-2,5	Screw terminal

Connection for outputs M12, 5-pin



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

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

CPI installation system

Technical data – Fieldbus node CP-FB05-E

FESTO

MOELLER

ABB

This fieldbus node handles communication between the decentralised CP system and a higher-order master. The fieldbus node is a slave station on the fieldbus and represents the I/O data and diagnostic information of the connected CP modules on the network. For the electrical peripherals, this module provides the separate electrical system supply for

- the electronics modules and sensor supply, and
- the load current of the valves.

The FB5 fieldbus node supports three different company-specific fieldbus protocols, based on a floating RS485 connection. The required protocol is selected by means of switch settings.

- Festo fieldbus
- ABB CS31
- Moeller SUCONET K

Application

Bus connection

The bus connection on the FB5 is established by means of a 9-pin Sub-D plug. In the case of operation on the fieldbus, the incoming control signals from the node via the fieldbus are permanently forwarded to the connected CP modules. The CP modules ensure that the programmed output signals are present or switch the relevant valves.

- Note

Alternatively the bus connection can be established via a 2x M12 adapter plug (B-coded).

Implementation

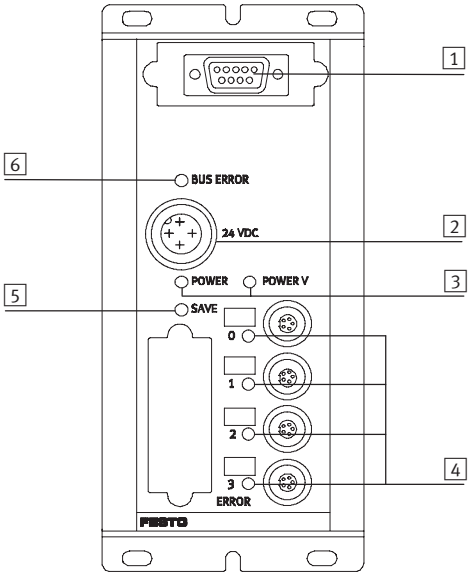
The FB5 supports the digital input and output modules and the solenoid coils. It can service a total of 64 digital outputs, of which max. 4x 16 can include solenoid coils, and 64 digital inputs.

- Note

Please observe the general guidelines on I/O addressing when assigning the outputs.

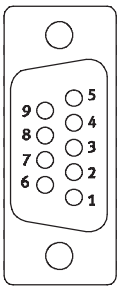
General technical data		
Type		**CP-FB05-E**
Part No.		**18 238**
Baud rates	Festo fieldbus	Set using HW switch • 31.25 kbps • 62.50 kbps • 187.50 kbps • 375 kbps
	ABB CS31	187.50 kbps
	Moeller SUCONET K	Baud rate set automatically • 187.50 kbps • 375 kbps
Addressing range	Festo fieldbus	1 ... 98
	ABB CS31	0 ... 60
	Moeller SUCONET K	1 ... 98
Type of communication	Festo fieldbus	Cyclic polling
	ABB CS31	I16, O16 or I/O16
	Moeller SUCONET K	Up to 32 I/O: SIS-K-06/07 Up to 64 I/O: SIS-K-10/10
Max. no. of solenoid coils		64
Max. no. of outputs incl. solenoid coils		64
Max. no. of inputs		64
LED diagnostic indicators	Power	Power supply indicator for internal electronics
	Power V	Power supply indicator for valves
	0...3	CP string LED
	Bus	Bus error status
Device-specific diagnostics transmitted to the controller		• Short circuit/overload of outputs • Undervoltage of valves • Undervoltage of outputs • Undervoltage of sensor supply
Operating voltage	Nominal value	24 V DC polarity-safe
	Permissible range	20.4 ... 26.4 V
	Power failure buffering	20 ms
Current consumption pin 1	Fieldbus node	250 mA
	CP modules	560 mA (internal electronics) + total current consumption of inputs
Current limiting	Electronics of fieldbus node and CP connection	Max. 1.25 A, short circuit proof
Load voltage pin 2	Solenoid valves	Total of all valves switched simultaneously, see technical data on CP valves ➔ 4 / 2.1-2 and 4 / 2.1-90 Compact Performance valve terminals CPV and CPA
Current limiting	Supply for solenoid valves	Max. 2.5 A, fused
Approval		CE
Protection class to EN 60 529		IP65
Temperature range	Operation	–5 ... +50 °C
	Storage	–20 ... +70 °C
Materials	Housing	Die-cast aluminium
Dimensions (LxWxD)		196.4 x 88 x 61.5 mm
Weight		925 g

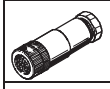
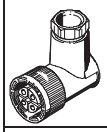
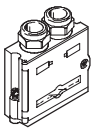
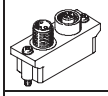
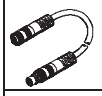
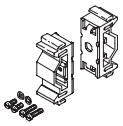
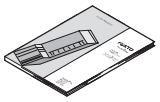
Connection and display components



1 Plug for fieldbus cable
2 Operating voltage connection for CP and valves
3 Operating voltage LEDs
4 String LEDs
5 Save key
6 Bus-specific LED

Pin allocation for fieldbus interface (plug view)

Plug view	Pin	Festo Sub-D plug (IP65)	Manufacturer-specific signal designation			
			Festo fieldbus interface	ABB CS31	Moeller SUCONET K	
					Sub-D, 9-pin	DIN (round), 5-pin
	1					
	2					
	3	B	S+	Bus1	3 (T_A/R_A)	4 (T_A/R_A)
	4					
	5					
	6					
	7					
	8	A	S-	Bus2	7 (T_B/R_B)	1 (T_B/R_B)
	9					
	Housing	Cable clip	Screen	Screen	4 (screen)	Housing

Ordering data				
Designation			Type	Part No.
Power supply				
	Power supply socket, straight	for 1.5 mm^2	**NTSD-GD-9**	**18 493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm^2	**NTSD-WD-9**	**18 527**
		for 2.5 mm^2	**NTSD-WD-11**	**533 119**
Fieldbus connection				
	Fieldbus socket, Sub-D connection		**FBS-Sub-9-GS-DP-B**	**532 216**
	M12 adapter		**FBA-2-M12-5POL-RK**	**533 118**
Valve terminal connection				
	Connecting cable WS-WD	0,25 m	**KVI-CP-3-WS-WD-0,25**	**540 327**
		0,5 m	**KVI-CP-3-WS-WD-0,5**	**540 328**
		2 m	**KVI-CP-3-WS-WD-2**	**540 329**
		5 m	**KVI-CP-3-WS-WD-5**	**540 330**
		8 m	**KVI-CP-3-WS-WD-8**	**540 331**
	Connecting cable GS-GD	2 m	**KVI-CP-3-GS-GD-2**	**540 332**
		5 m	**KVI-CP-3-GS-GD-5**	**540 333**
		8 m	**KVI-CP-3-GS-GD-8**	**540 334**
Mounting				
	Mounting for H-rail		**CP-TS-HS35**	**170 169**
User documentation				
	User documentation – Bus node CP-FB5-E	German	**P.BE-CP-FB5-E-DE**	**165 105**
		English	**P.BE-CP-FB5-E-EN**	**165 205**
		French	**P.BE-CP-FB5-E-FR**	**165 135**
		Italian	**P.BE-CP-FB5-E-IT**	**165 165**

CPI installation system

Technical data – Fieldbus node CP-FB06-E

This fieldbus node handles communication between the decentralised CP system and a higher-order master. The fieldbus node is a slave station on the fieldbus and represents the I/O data and diagnostic information of the connected CP modules on the network.

For the electrical peripherals, this module provides the separate electrical system supply for

- the electronics modules and sensor supply, and
- the load current of the valves.

Application

Bus connection

The bus connection is established via two 9-pin M23 connections with a typical Interbus pin allocation. The plug and socket are labelled with Remote IN and Remote OUT in accordance with the definition for the Interbus remote bus. Both bus cables are always routed to the fieldbus node and looped through in accordance with the ring structure of the Interbus.

The CP fieldbus node receives the data from the higher-order controller and forwards it to the connected CP valve terminals or electrical output modules. The signal status of the inputs is requested from the input modules and forwarded to the CP fieldbus nodes.

Implementation

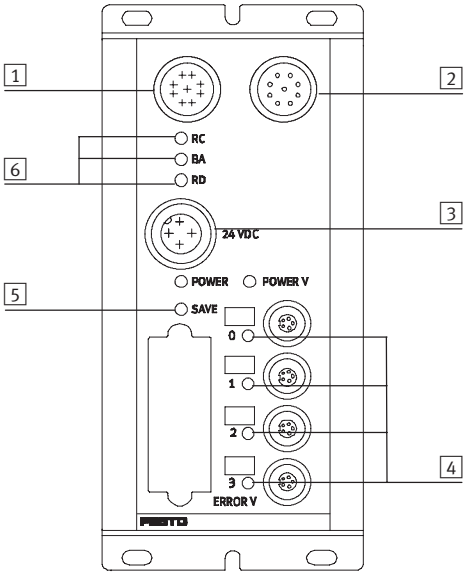
The FB6 supports the digital input and output modules and the solenoid coils. It can service a total of 64 digital outputs, of which max. 64 can include solenoid coils, and 64 digital inputs.

- Note

Please observe the general guidelines regarding addressing when assigning outputs.

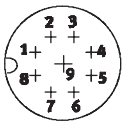
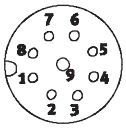
General technical data		
Type		**CP-FB06-E**
Part No.		**18 225**
Baud rates		500 kbps
ID code		3
No. of process data bits		16, 32, 48 or 64 depending on expansion
PCP channel		No
Configuration support		Icon file for CMD software Station description file with CMD software
Max. no. of solenoid coils		64
Max. no. of outputs incl. solenoid coils		64
Max. no. of inputs		64
LED diagnostic indicators	Power	Power supply indicator for internal electronics
	Power V	Power supply indicator for valves
	0...3	CP string LED
	RC	Remotebus check
	BA	Bus active
	RD	Remotebus disable
Device-specific diagnostics transmitted to the controller as common message (peripherals errors)		• Short circuit/overload of outputs • Undervoltage of valves • Undervoltage of outputs • Undervoltage of sensor supply
Additional functions		Test routine for checking the valves and outputs without bus communication
Operating voltage	Nominal value	24 V DC polarity-safe
	Permissible range	20.4 ... 26.4 V
	Power failure buffering	20 ms
Current consumption pin 1	Fieldbus node	250 mA
	CP modules	560 mA (internal electronics) + total current consumption of inputs
Current limiting	Electronics of fieldbus node and CP connection	Max. 1.25 A, short circuit proof
Load voltage pin 2	Solenoid valves	Total of all valves switched simultaneously, see technical data on CP valves ➔ 4 / 2.1-2 and 4 / 2.1-90 Compact Performance valve terminals CPV and CPA
Current limiting	Supply for solenoid valves	Max. 2.5 A, fused
Protection class to EN 60 529		IP65
Temperature range	Operation	–5 ... +50 °C
	Storage	–20 ... +70 °C
Materials	Housing	Die-cast aluminium
Dimensions (LxWxD)		196.4 x 88 x 61.5 mm
Weight		915 g

Connection and display components

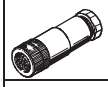
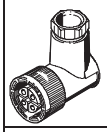
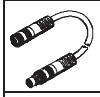
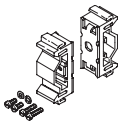


1 Remote bus incoming
2 Remote bus outgoing
3 Voltage supply connection
4 String LEDs
5 Save key
6 Interbus-specific LEDs

Pin allocation for the INTERBUS interface, non-floating installation remote bus

Pin allocation	Pin No.[1]	Signal	Designation
Incoming			
Plug view 	1	DO	Data out
	2	/DO	Data out inverse
	3	DI	Data in
	4	/DI	Data in inverse
	5	Load	Reference conductor
	6	FE	Functional earthing for installation remote bus
	7	+24 V	Installation remote bus supply
	8	+0 V	Installation remote bus supply
	Sleeve	Screen	Screening
Outgoing			
Socket view 	1	DO	Data out
	2	/DO	Data out inverse
	3	DI	Data in
	4	/DI	Data in inverse
	5	Load	Reference conductor
	6	FE	Functional earthing for installation remote bus
	7	+24 V	Installation remote bus supply
	8	+0 V	Installation remote bus supply
	9	RBST	Establish bridge to pin 5
	Sleeve	Screen	Screening

1) Pins not listed here must not be connected.

Ordering data				
Designation			Type	Part No.
Power supply				
	Power supply socket, straight	for 1.5 mm^2	**NTSD-GD-9**	**18 493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm^2	**NTSD-WD-9**	**18 527**
		for 2.5 mm^2	**NTSD-WD-11**	**533 119**
Valve terminal connection				
	Connecting cable WS-WD	0,25 m	**KVI-CP-3-WS-WD-0,25**	**540 327**
		0,5 m	**KVI-CP-3-WS-WD-0,5**	**540 328**
		2 m	**KVI-CP-3-WS-WD-2**	**540 329**
		5 m	**KVI-CP-3-WS-WD-5**	**540 330**
		8 m	**KVI-CP-3-WS-WD-8**	**540 331**
	Connecting cable GS-GD	2 m	**KVI-CP-3-GS-GD-2**	**540 332**
		5 m	**KVI-CP-3-GS-GD-5**	**540 333**
		8 m	**KVI-CP-3-GS-GD-8**	**540 334**
Mounting				
	Mounting for H-rail		**CP-TS-HS35**	**170 169**
User documentation				
	User documentation – Bus node CP-FB06-E	German	**P.BE-CP-FB6-E-DE**	**165 106**
		English	**P.BE-CP-FB6-E-EN**	**165 206**
		French	**P.BE-CP-FB6-E-FR**	**165 136**
		Italian	**P.BE-CP-FB6-E-IT**	**165 166**
		Spanish	**P.BE-CP-FB6-E-ES**	**165 236**
		Swedish	**P.BE-CP-FB6-E-SV**	**165 266**

DeviceNet

This fieldbus node handles communication between the decentralised CP system and a higher-order master. The fieldbus node is a slave station on the fieldbus and represents the I/O data and diagnostic information of the connected CP modules on the network.

For the electrical peripherals, this module provides the separate electrical system supply for
- the electronics modules and sensor supply, and
- the load current of the valves.

The FB11 fieldbus node supports the CAN-based fieldbus protocol DeviceNet.
- DeviceNet

Application

Bus connection

The DeviceNet connection is established via a 5-pin M12 plug with pins that corresponds to the specific mini connector. A DeviceNet installation with a higher degree of protection is typically installed using main and branch lines that are connected via T-pieces.
Various manufacturers such as Turck, Lumberg and Rockwell offer finished cables and terminating resistors. The terminating resistors are attached to the two outermost T-pieces.
This installation technique keeps the bus closed while a bus station is being removed. Provides detailed diagnostic information about status bits for the master controller.

Implementation

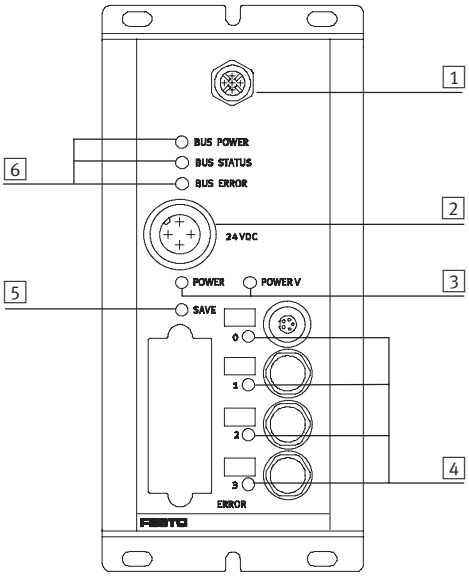
The FB11 supports the digital input and output modules.
It can service a total of 64 digital inputs and 64 digital outputs, of which max. 64 can include solenoid coils.

- Note

Please observe the general guidelines on I/O addressing when assigning the outputs.

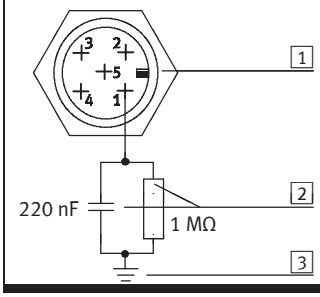
General technical data		
Type		**CP-FB11-E**
Part No.		**18 227**
Baud rates		Set using HW switch • 125 kbps • 250 kbps • 500 kbps
Addressing range		Set using 2 rotary switches 0 ... 63
Product type		Communication converter (12 dec.)
Product code		2282 hex./35050 dec.
Type of communication		Polling/Cos/Bit Strobe
Configuration support		EDS file and graphics symbol
Max. no. of solenoid coils		64
Max. no. of outputs and solenoid coils		64
Max. no. of inputs		64
LED diagnostic indicators	Bus/Power	Operating voltage of bus
	Module status	Operating status
	I/O Error	Internal error
Device-specific diagnosis via DeviceNet		• Short circuit/overload of outputs • Undervoltage of valves • Undervoltage of outputs • Undervoltage of sensor supply • Interrupt point on CP string
Operating voltage	Nominal value	24 V DC polarity-safe
	Permissible range	20.4 ... 26.4 V
	Power failure buffering	20 ms
Current consumption pin 1	Fieldbus node	250 mA
	CP module	560 mA (internal electronics) + total current consumption of inputs, internal
Current limiting	Electronics of fieldbus node and CP connection	Max. 1.25 A, short circuit proof
Current consumption pin 2	Solenoid valves	Total of all valves switched simultaneously, see technical data on CP valves ➔ 4 / 2.1-2 and 4 / 2.1-90 Compact Performance valve terminals CPV and CPA
Protection class to EN 60 529		IP65
Temperature range	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials	Housing	Die-cast aluminium
Dimensions (HxWxD)		196.4 x 88 x 61.5 mm
Grid dimension		72 mm
Weight		950 g

Connection and display components

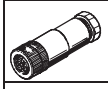
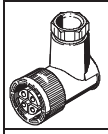
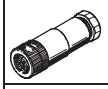
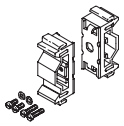
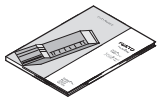


1 Plug for fieldbus cable
2 Operating voltage connection for CP and valves
3 Operating voltage LEDs
4 String LEDs
5 Save key
6 Bus status LEDs

Pin allocation for fieldbus interface



Pin allocation	Pin No.	Signal
1 Plug	1	Screen
	2	+24 V bus
	3	GND Bus
	4	Data+
	5	Data–
2 Housing of the fieldbus connection module PE		
3 Internal screening connection in the valve terminal		

Ordering data				
Designation			Type	Part No.
Power supply				
	Power supply socket, straight	for 1.5 mm^2	**NTSD-GD-9**	**18 493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm^2	**NTSD-WD-9**	**18 527**
		for 2.5 mm^2	**NTSD-WD-11**	**533 119**
Fieldbus connection				
	Bus connection, straight, PG9, 5-pin		**FBSD-GD-9-5POL**	**18 324**
Valve terminal connection				
	Connecting cable WS-WD	0,25 m	**KVI-CP-3-WS-WD-0,25**	**540 327**
		0,5 m	**KVI-CP-3-WS-WD-0,5**	**540 328**
		2 m	**KVI-CP-3-WS-WD-2**	**540 329**
		5 m	**KVI-CP-3-WS-WD-5**	**540 330**
		8 m	**KVI-CP-3-WS-WD-8**	**540 331**
	Connecting cable GS-GD	2 m	**KVI-CP-3-GS-GD-2**	**540 332**
		5 m	**KVI-CP-3-GS-GD-5**	**540 333**
		8 m	**KVI-CP-3-GS-GD-8**	**540 334**
Mounting				
	Mounting, for H-rail		**CP-TS-HS35**	**170 169**
User documentation				
	User documentation – Bus node CP-FB11-E	German	**P.BE-CP-FB11-E-DE**	**165 111**
		English	**P.BE-CP-FB11-E-EN**	**165 211**
		French	**P.BE-CP-FB11-E-FR**	**165 141**
		Italian	**P.BE-CP-FB11-E-IT**	**165 171**
		Spanish	**P.BE-CP-FB11-E-ES**	**165 241**
		Swedish	**P.BE-CP-FB11-E-SV**	**165 271**

CPI installation system

Technical data – Fieldbus node CP-FB13-E

This fieldbus node handles communication between the decentralised CP system and a higher-order master via Profibus DP. The fieldbus node is a slave station on the fieldbus and represents the I/O data and diagnostic information of the connected CP modules on the network.

For the electrical peripherals, this module provides the separate electrical system supply for

- the electronics modules and sensor supply, and
- the load current of the valves.

The status of the voltage supplies and the bus communication is indicated via the LEDs Power, Power Valves, String Error and Bus Error.

- Profibus-DP

Application

Bus connection

The bus connection is established via a 9-pin Sub-D socket with a typical Profibus allocation (to EN 50 170). The bus connector plug (with protection class IP65 from Festo or IP20 from other manufacturers) facilitates the connection of an incoming and an outgoing bus cable. An active bus terminal can be connected using the integrated DIL switch. The Sub-D interface is designed for the control of network components via a fibre optic cable connection and provides detailed diagnostic information for master detection.

- Note

Alternatively the bus connection can be established via a 2x M12 adapter plug (B-coded).

Implementation

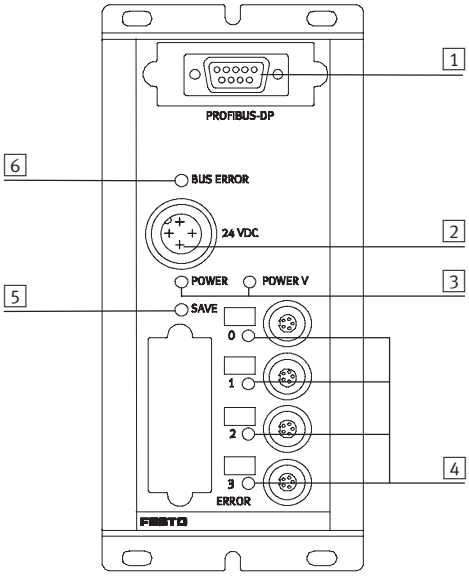
The FB13 supports digital input and output modules and solenoid coils.
64 digital outputs in total, of which max. 64 solenoid coils.
Max. 64 digital inputs for recording sensor signals.

- Note

When assigning the electrical modules, please observe the configuration guidelines for valve terminals in relation to address allocation and the number of occupied module positions.

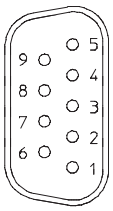
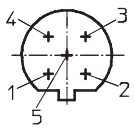
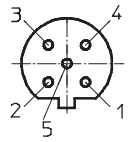
General technical data		
Type		**CP-FB13-E**
Part No.		**174 337**
Baud rates		Automatic detection 9.6 kBaud ... 12 MBaud
Addressing range		Set using 2 DIL switches 1 ... 125
Product family		4: Valves
Ident. number		0xFB13
Type of communication		Cyclic communication
Configuration support		GSD file and bitmaps
Max. no. of solenoid coils		64
Max. no. of outputs and solenoid coils		64
Max. no. of inputs		64
LED diagnostic indicators	Power	Operating voltage of electronics
	Power V	Operating voltage of valves and outputs
	Bus Error	Communication error
	0...3	CP string
Device-specific diagnostics via Profibus-DP		• Short circuit/overload of outputs • Undervoltage of valves • Undervoltage of outputs • Undervoltage of sensor supply • Interrupt points on CP string
Additional functions		• Test routine for checking the valves and outputs without bus communication
Operating voltage	Nominal value	24 V DC polarity-safe
	Permissible range	20.4 ... 26.4 V
	Power failure buffering	20 ms
Current consumption pin 1	Fieldbus node	250 mA
	CP module	560 mA (internal electronics) + total current consumption of inputs, internal
Current limiting	Electronics of fieldbus node and CP connection	Max. 1.25 A, short circuit proof
Current consumption pin 2	Solenoid valves	Total of all valves switched simultaneously, see technical data on CP valves ➔ 4 / 2.1-2 and 4 / 2.1-90 Compact Performance valve terminals CPV and CPA
Current limiting	Supply for solenoid valves	Max. 2.5 A, fused
Protection class to EN 60 529		IP65
Temperature range	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials	Housing	Die-cast aluminium
Dimensions (LxWxD)		196.4 x 88 x 61.5 mm
Grid dimension		72 mm
Weight		925 g

Connection and display components

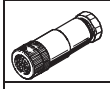
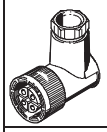
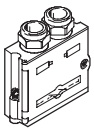
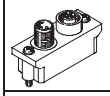
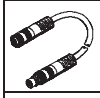
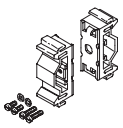
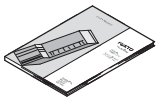


1 Plug for fieldbus cable
2 Operating voltage connection for CP and valves
3 Operating voltage LEDs
4 String LEDs
5 Save key
6 Bus-specific LED

Pin allocation for Profibus DP interface

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

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

Ordering data				
Designation			Type	Part No.
Power supply				
	Power supply socket, straight	for 1.5 mm²	**NTSD-GD-9**	**18 493**
		for 2.5 mm²	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm²	**NTSD-WD-9**	**18 527**
		for 2.5 mm²	**NTSD-WD-11**	**533 119**
Fieldbus connection				
	Plug Sub-D, for Profibus DP		**FBS-SUB-9-GS-DP-B**	**532 216**
	Bus connection 2x M12 adapter plug (B-coded) for Profibus DP		**FBA-2-M12-5POL-RK**	**533 118**
Valve terminal connection				
	Connecting cable WS-WD	0,25 m	**KVI-CP-3-WS-WD-0,25**	**540 327**
		0,5 m	**KVI-CP-3-WS-WD-0,5**	**540 328**
		2 m	**KVI-CP-3-WS-WD-2**	**540 329**
		5 m	**KVI-CP-3-WS-WD-5**	**540 330**
		8 m	**KVI-CP-3-WS-WD-8**	**540 331**
	Connecting cable GS-GD	2 m	**KVI-CP-3-GS-GD-2**	**540 332**
		5 m	**KVI-CP-3-GS-GD-5**	**540 333**
		8 m	**KVI-CP-3-GS-GD-8**	**540 334**
Mounting				
	Mounting for H-rail		**CP-TS-HS35**	**170 169**
User documentation				
	User documentation – Bus node CP-FB13-E	German	**P.BE-CP-FB13-E-DE**	**165 113**
		English	**P.BE-CP-FB13-E-EN**	**165 213**
		French	**P.BE-CP-FB13-E-FR**	**165 143**
		Italian	**P.BE-CP-FB13-E-IT**	**165 173**
		Swedish	**P.BE-CP-FB13-E-SV**	**165 273**

CPI installation system

Technical data – Input modules CP-E16

FESTO

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 a DUO plug or DUO cable.

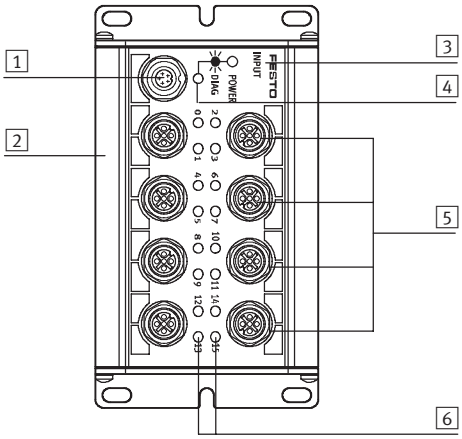
Application

- 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 positive switching	CP-E16N-M8 negative switching	CP-E16-M12x2-5POL positive switching
Part No.			18 205	18 243	175 561
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	≥–11	≤6
	Signal 1	[V]	≥11	≤–5	≥8.6
Input delay		[ms]	Typically 5		Typically 3
Switching logic			PNP	NPN	PNP
Input characteristic curve			To IEC 1131-2		
Connection to bus node			Via pre-assembled cables		
Protection class to EN 60 529			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

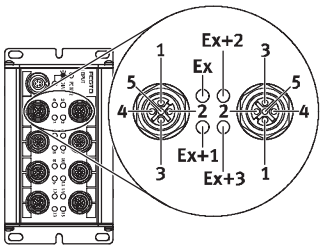
General technical data					
Type			**CP-E16N-M12x2 negative switching**	**CP-E16-M8-Z positive and negative switching**	
Part No.			**18 244**	**189 670**	
No. of inputs			16		
Allocation of inputs			Double allocation	Single allocation	
Sensor connection type			8x M12, 4-pin	16x M8, 3-pin	
Power supply 24 V DC			Coming from bus node	Coming from bus node, connection for additional sensor supply	
Intrinsic current consumption of electronics		[mA]	90	40	
Input current at 24 V DC (from sensor)		[mA]	Typically 8		
Fuse protection for sensors and electronic module			Internal electronic short circuit protection	Electronic short circuit protection per group	
Max. current consumption of sensor supply, residual current		[A]	Max. 0.5	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]	≥11	≤6	≥–8.6
	Signal 1	[V]	≤5	≥8.6	≤–6
Input delay		[ms]	Typically 5	Typically 3	
Switching logic			NPN	PNP/NPN	
Input characteristic curve			To IEC 1131-2		
Connection to bus node			Via pre-assembled cables		
Protection class to EN 60 529			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]	140.9 x 78 x 55.2	216.9 x 66 x 50.6	
Weight		[g]	500	420	

Connection and display components
CP-E16-M12x2-5POL and CP-E16N-M12x2

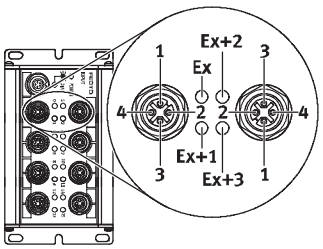


1 CP connection
2 Slot for inscription labels (ISB 6x10)
3 Identification of input type:
-INPUT-P for PNP inputs
-INPUT-N for NPN inputs
4 Status LED (green)
5 Sensor connections
6 Green LED for status display (one LED per input)

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

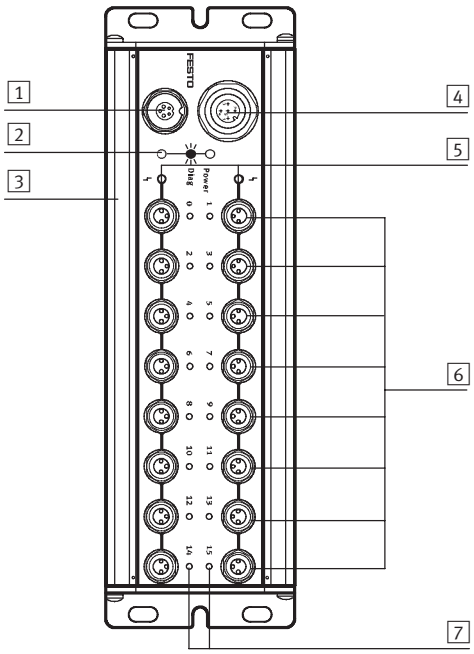
Pin allocation for sensor connections CP-E16...-M12x2

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*

* Ix = Input x

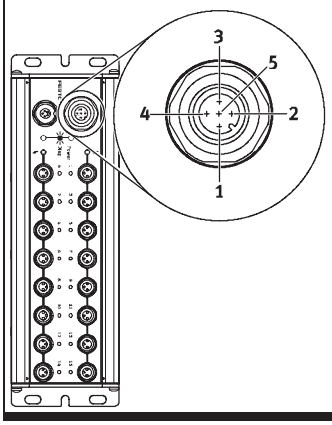
Connection and display components

CP-E16-M8-Z



1 CP connection
2 Status LED (green)
3 Slot for inscription labels (ISB 6x10)
4 Connection for 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)

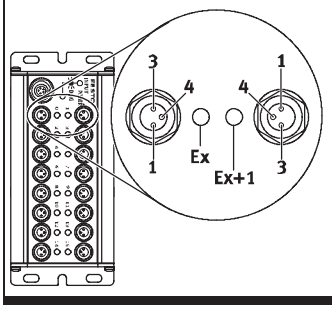
Pin allocation for external sensor supply CP-E16-M8-Z

Pin allocation	Pin	Signal	Description
	1	24 V DC ±25%	Operating voltage
	2	PNP/NPN	Coding with negative/positive switching: – PNP operation (pin 2 and 3 bridged) – NPN operation (pin 2 and 1 bridged)
	3	0 V	Operating voltage 0 V
	4	n.c.	Not connected
	5	Ground	Earth terminal

Note

External sensor supply for CP-E16-M8-Z:
Specified for PNP or NPN operation (type CP-E16-M8-Z).
The input module provides PNP or NPN inputs. The setting for PNP or NPN operation is made by installing a bridge in the socket of the sensor supply connection.

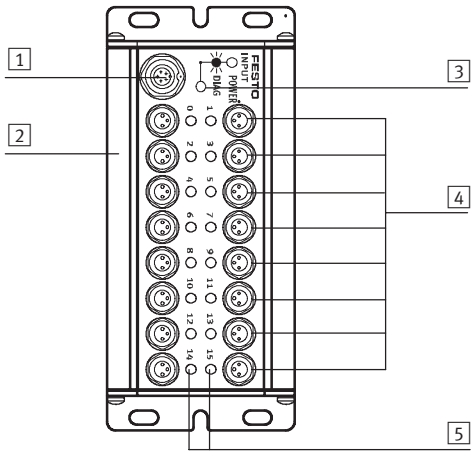
Pin allocation for sensor connections CP-E16...-M8 and CP-E16-M8-Z

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

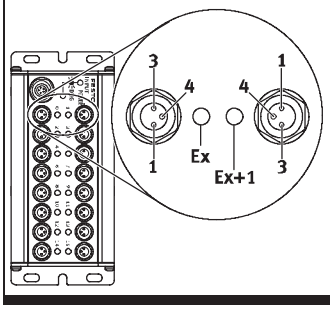
Connection and display components

CP-E16-M8 and CP-E16N-M8



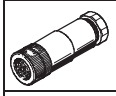
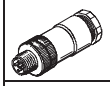
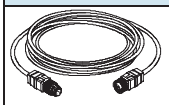
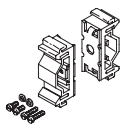
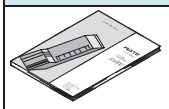
1 CP connection
2 Slot for inscription labels (ISB 6x10)
3 Status LED (green)
4 Sensor connections
5 Green LED for status display (one LED per input)

Pin allocation for sensor connections CP-E16...-M8 and 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

Ordering data

Designation			Type	Part No.
Power supply				
	Power supply socket, straight, M12		**FBSD-GD-9-5POL**	**18 324**
Sensor plugs				
	Plug, straight socket, M12	5-pin, PG7	**SEA-M12-5GS-PG7**	**175 487**
		4-pin, PG7	**SEA-GS-7**	**18 666**
		4-pin, 2.5 mm^2 O.D.	**SEA-4GS-7-2,5**	**192 008**
	Plug, straight, M8	3-pin, solderable	**SEA-GS-M8**	**18 696**
		3-pin, screw-in	**SEA-3GS-M8-S**	**192 009**
	Plug for 2 sensor cables, M12, PG11	4-pin	**SEA-GS-11-DUO**	**18 779**
		5-pin	**SEA-5GS-11-DUO**	**192 010**
Sensor cables				
	Connecting cable, M12, 4-pin, straight plug-straight socket	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
	Connecting cable, M12, 4-pin, straight plug-angled socket	1.0 m	**KM12 M12-GSWD-1-4**	**185 499**
	Connecting cable, M8, straight plug-straight socket	0.5 m	**KM8-M8-GSGD-0,5**	**175 488**
		1.0 m	**KM8-M8-GSGD-1**	**175 489**
		2.5 m	**KM8-M8-GSGD-2,5**	**165 610**
		5.0 m	**KM8-M8-GSGD-5**	**165 611**
Mounting				
	Mounting for H-rail		**CP-TS-HS35**	**170 169**
User documentation				
	User documentation for input/output modules	German	**P.BE.-CPEA-DE**	**165 125**
		English	**P.BE.-CPEA-EN**	**165 225**
		French	**P.BE.-CPEA-FR**	**165 127**
		Italian	**P.BE.-CPEA-IT**	**165 157**
		Spanish	**P.BE.-CPEA-ES**	**165 227**
		Swedish	**P.BE.-CPEA-SV**	**165 257**

CPI installation system

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

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 a DUO plug or DUO cable.

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					
Type			**CP-E16-M12-EL positive switching**	**CP-E16-M8-EL positive switching**	**CP-E32-M8-EL positive switching**
Part No.			**546 923**	**546 922**	**546 921**
No. of inputs			16		32
Allocation of inputs			Double allocation	Single allocation	Double allocation
Sensor connection type			16x M12, 5-pin	16x M8, 3-pin	32x M8, 4-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		Internal electronic fuse
Max. residual current per module		[A]	0.7		1.4
Nominal operating voltage for sensors			24		
Operating voltage range for sensors		[V]	18 ... 30 DC		
Galvanic isolation			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)		
Signal extension			0.5 ms (15 ms, 50 ms, 100 ms, parameterisable)		
Switching logic			PNP		
Input characteristic curve			To IEC 1131-2		
Connection to bus node			Via pre-assembled cables		
Diagnostics			CP communication		
			Short circuit/overload		
			Undervoltage		
LEDs			2 Module diagnostics 4 Group diagnostics 16 Channel status		2 Module diagnostics 32 Channel status

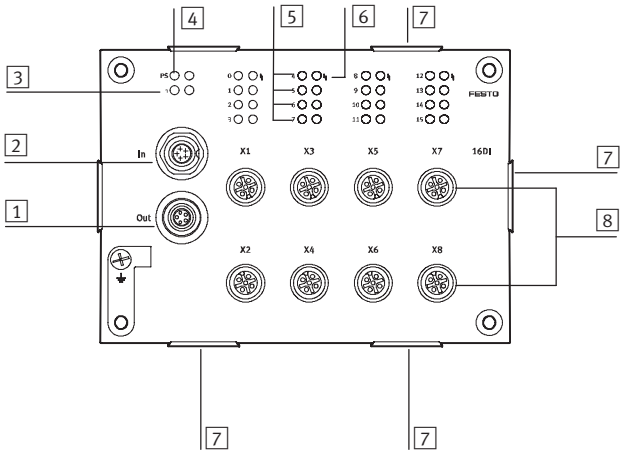
General technical data					
Type			**CP-E16-M12-EL positive switching**	**CP-E16-M8-EL positive switching**	**CP-E32-M8-EL positive switching**
Part No.			**546 923**	**546 922**	**546 921**
Dimensions (LxWxH)		[mm]	143 x 104 x 30		
Weight		[g]	260		

Operating conditions					
Type			**CP-E16-M12-EL**	**CP-E16-M8-EL**	**CP-E32-M8-EL**
Protection class to EN 60529			IP65 (when fully plugged in or fitted with protective cover)		
Ambient temperature	Operation	[°C]	–5 ... +50		
	Storage	[°C]	–20 ... +70		
Corrosion resistance class CRC[1)]			1		
CE mark (see declaration of conformity)			In accordance with EU EMC directive		
Certification			cULus listed (OL)		

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.

Connection and display components

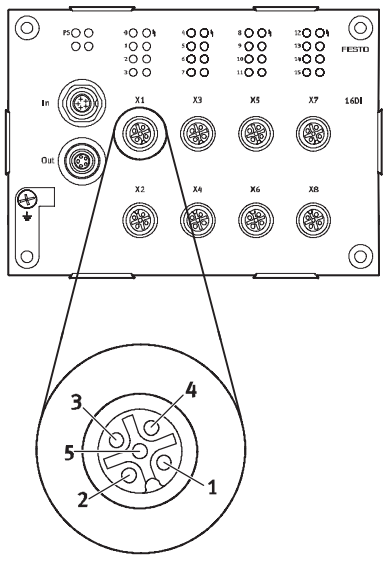
CP-E16-M12-EL



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

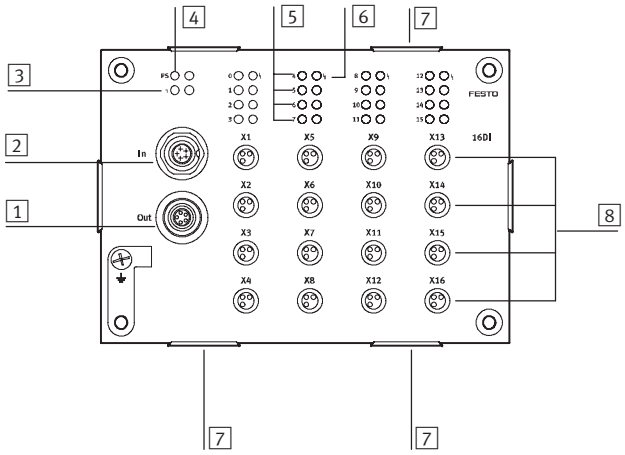


Pin	Signal	Description
1	24 V	Operating voltage 24 V
2	Ix+1*	Sensor signal
3	0 V	Operating voltage 0 V
4	Ix*	Sensor signal
5	Ground	Earth terminal

* Ix = Input x

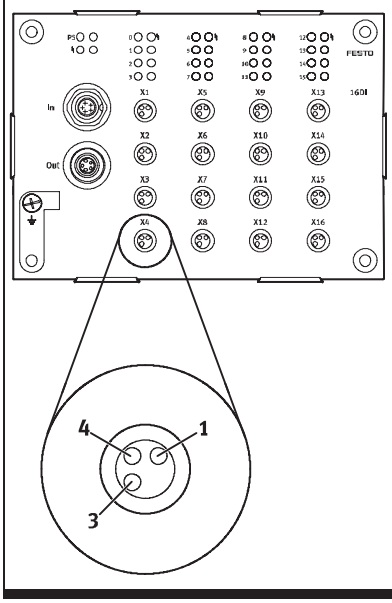
Connection and display components

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

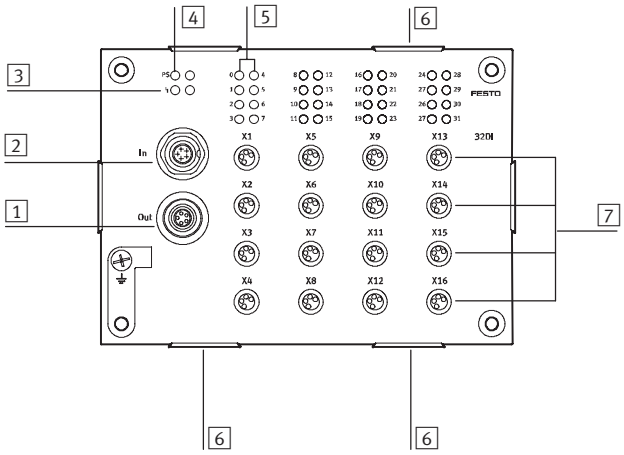


Pin	Signal	Description
1	24 V	Operating voltage 24 V
3	0 V	Operating voltage 0 V
4	Ix*	Sensor signal

* Ix = Input x

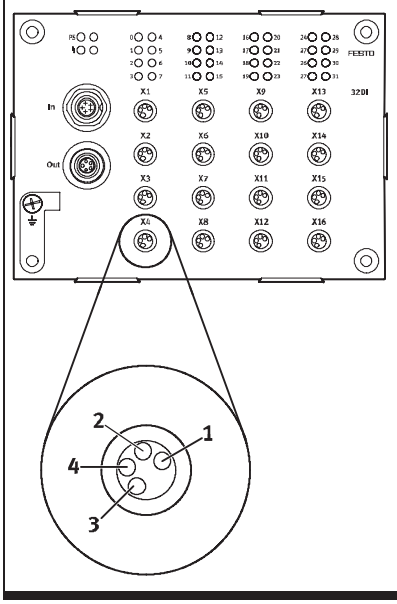
Connection and display components

CP-E32-M8-EL



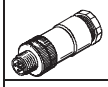
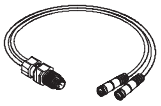
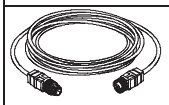
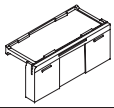
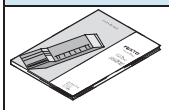
1 CP connection, outgoing
2 CP connection, incoming
3 Status LED (module) for short circuit/overload of sensor supply (red)
4 Status LED for CP communication (green)
5 Status LEDs for inputs (status display, green)
6 Fixture for inscription label holder ASCF-H-E2
7 Sensor connections (2 inputs per socket)

Pin allocation for sensor connections CP-E32-M8-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

* Ix = Input x

Ordering data

Designation			Type	Part No.
Plug connectors				
	Straight plug, M12	5-pin, PG7	**SEA-M12-5GS-PG7**	**175 487**
		4-pin, PG7	**SEA-GS-7**	**18 666**
		4-pin, 2.5 mm² O.D.	**SEA-4GS-7-2,5**	**192 008**
	Straight plug, M8	3-pin, solderable	**SEA-GS-M8**	**18 696**
		3-pin, screw-in	**SEA-3GS-M8-S**	**192 009**
	Plug for 2 cables, M12, PG11	4-pin	**SEA-GS-11-DUO**	**18 779**
		5-pin	**SEA-5GS-11-DUO**	**192 010**
Connecting cables				
	DUO cable, 1x straight plug M12	2x straight socket M8	**KM12-DUO-M8-GDGD**	**18 685**
		1x straight socket M8 and 1x angled socket M8	**KM12-DUO-M8-GDWD**	**18 688**
		2x angled socket M8	**KM12-DUO-M8-WDWD**	**18 687**
	Connecting cable, M12, 4-pin, straight plug-straight socket	2.5 m	**NEBU-M12G4-K-2.5-M12G4**[1]	**539 052**
		5.0 m	**NEBU-M12G4-K-5-M12G4**[1]	**539 052**
	Connecting cable, M8, 3-pin, straight plug-straight socket	0.5 m	**NEBU-M8G3-K-0.5-M8G3**[1]	**539 052**
		1 m	**NEBU-M8G3-K-1-M8G3**[1]	**539 052**
		2.5 m	**NEBU-M8G3-K-2.5-M8G3**[1]	**539 052**
		5 m	**NEBU-M8G3-K-5-M8G3**[1]	**539 052**
Inscription label holders				
	Inscription label holders for EL modules, bag of 10		**ASCF-H-E2**	**547 473**
User documentation				
	User documentation for input/output modules	German	**P.BE.-CPEA-CL-DE**	**539 299**
		English	**P.BE.-CPEA-CL-EN**	**539 300**
		French	**P.BE.-CPEA-CL-FR**	**539 302**
		Italian	**P.BE.-CPEA-CL-IT**	**539 303**
		Spanish	**P.BE.-CPEA-CL-ES**	**539 301**
		Swedish	**P.BE.-CPEA-CL-SV**	**539 304**

1) Modular product, further information ➔ www.festo.com/catalogue/nebu

CPI installation system

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

FESTO

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 a DUO plug or DUO cable.

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 function-ality (only in combination with the CPX CP interface)

General technical data					
Type Part No.			**CP-E08-M12-CL positive switching 538 787**	**CP-E08-M8-CL positive switching 538 788**	**CP-E16-KL-CL positive switching 538 789**
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]	18 ... 30 DC		
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		

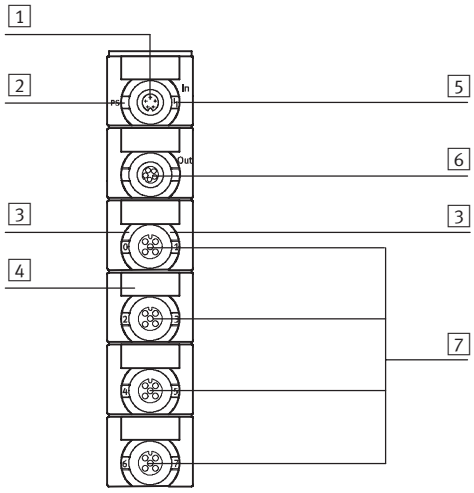
General technical data					
Type			**CP-E08-M12-CL positive switching**	**CP-E08-M8-CL positive switching**	**CP-E16-KL-CL positive switching**
Part No.			**538 787**	**538 788**	**538 789**
Material			Polybutylene terephthalate		
Dimensions (WxLxH)		[mm]	151 x 30 x 25		
Weight		[g]	165	190	145

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	Operation	[°C]	–5 ... +50		
	Storage	[°C]	–20 ... +70		
Corrosion resistance class CRC[1)]			1		
CE mark (see declaration of conformity)			In accordance with EU EMC directive		
Certification			cULus listed (OL)		

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.

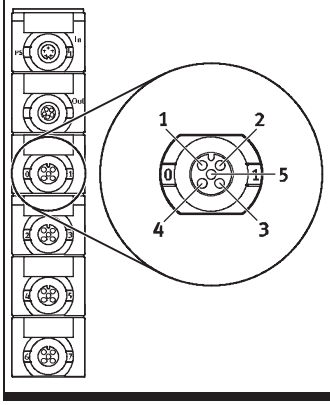
Connection and display components

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

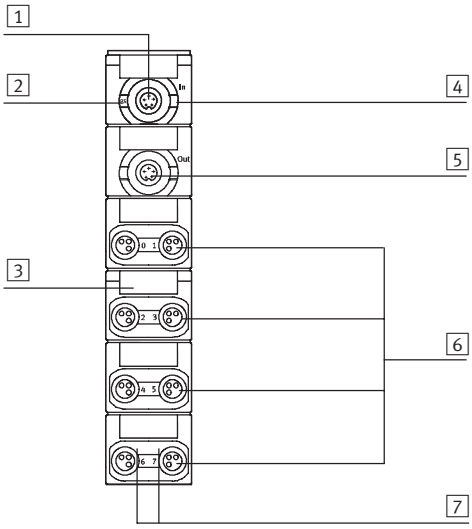
Pin allocation for sensor connections CP-E08-M12-CL

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

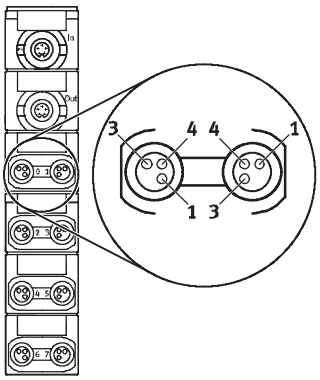
Connection and display components

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

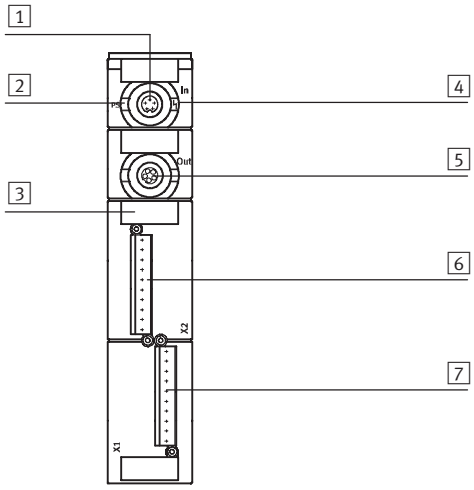
Pin allocation for sensor connections CP-E08-M8-CL

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

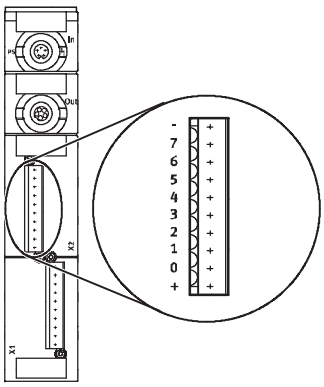
Connection and display components

CP-E16-KL-CL

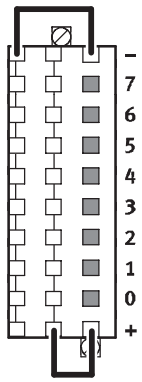


1 CP connection, incoming
2 Status LED (green)
3 Holder for inscription label (IBS 8x20)
4 Red LED for short circuit/overload indication
5 CP connection, outgoing
6 Sensor connections, plug X2
7 Sensor connections, plug X1

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

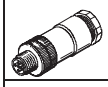
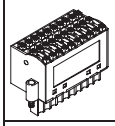
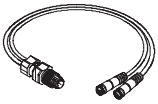
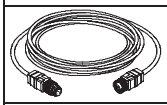
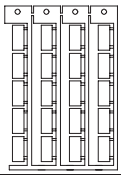
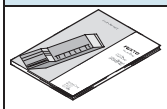
Pin allocation	Pin	Signal	Description	Pin	Signal	
	Plug X1			Plug X2		- Note
	+	24 V DC	Operating voltage	+	24 V DC	8 sensors can be connected to each of the connections X1 and X2. When using the three-row plug PS1 SAC30 or PS1-SAC31-30POL+LED, it is possible to use the second and third contact bank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

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



Connection row 0			Connection row 1		Connection row 2	
–	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			Type	Part No.
Sensor plugs				
	Plug, straight socket, M12	5-pin, PG7	**SEA-M12-5GS-PG7**	**175 487**
		4-pin, PG7	**SEA-GS-7**	**18 666**
		4-pin, 2.5 mm^2 O.D.	**SEA-4GS-7-2,5**	**192 008**
	Straight plug, M8	3-pin, solderable	**SEA-GS-M8**	**18 696**
		3-pin, screw-in	**SEA-3GS-M8-S**	**192 009**
	Plug for 2 sensor cables, M12, PG11	4-pin	**SEA-GS-11-DUO**	**18 779**
		5-pin	**SEA-5GS-11-DUO**	**192 010**
Connection sets for sensors				
	Plug, screw-in tension-spring socket with LED	3-row, 30-pin	**PS1-SAC31-30POL+LED**	**197 162**
Cables				
	DUO cable	2x straight socket	**KM12-DUO-M8-GDGD**	**18 685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18 688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18 687**
	Connecting cable, M12, 4-pin, straight plug-straight socket	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
Inscription labels				
	Inscription labels 8x20 mm in frames (20 pieces)		**IBS-8x20**	**539 388**
User documentation				
	User documentation for input/output modules	German	**P.BE.-CPEA-CL-DE**	**539 299**
		English	**P.BE.-CPEA-CL-EN**	**539 300**
		French	**P.BE.-CPEA-CL-FR**	**539 302**
		Italian	**P.BE.-CPEA-CL-IT**	**539 303**
		Spanish	**P.BE.-CPEA-CL-ES**	**539 301**
		Swedish	**P.BE.-CPEA-CL-SV**	**539 304**

CPI installation system

Technical data – Output modules CP-A08

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.

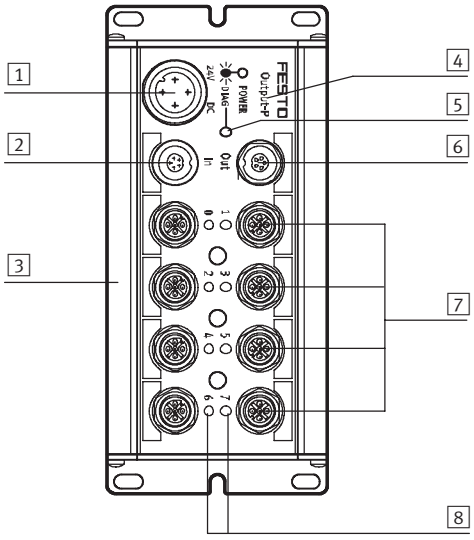
Application

- Output module with 8 outputs 24 V DC
- M12 connection technology, with 4- or 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	CP-A08N-M12 negative switching
Part No.			175 640	18 234
No. of outputs			8	
Allocation of outputs			Single allocation	
Output connection type			8x M12, 5-pin	8x M12, 4-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]	24 DC ±25%	
Load voltage connection		[V]	24 DC ±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	NPN 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	

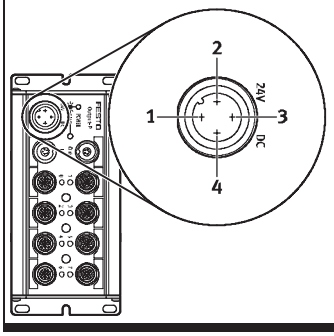
Connection and display components

CP-A08-M12...

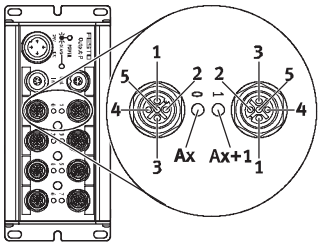
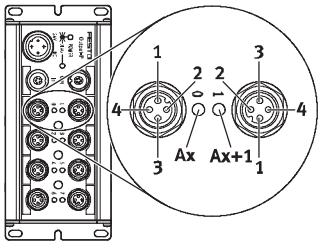


1 Load voltage connection
2 CP connection, incoming
3 Slot for inscription labels (ISB 6x10)
4 Identifier for output type:
– OUTPUT-P for PNP outputs
– OUTPUT-N for NPN outputs
5 Status LED (green)
6 CP connection, outgoing
7 Connections for actuators
8 Yellow LED for status display (one LED per output)

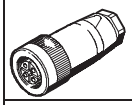
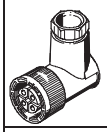
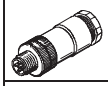
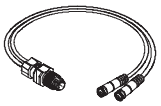
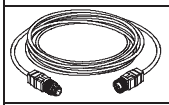
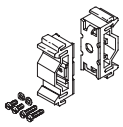
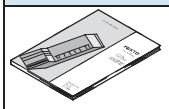
Pin allocation for load voltage connection CP-A08-M12...

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 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.
	2	Ox+1	Connected with pin 4 of plug 2/ not connected	2	n.c.	
	3	0 V	Reference potential	3	0 V	
	4	Ox	Output/connected with pin 2 of plug 1	4	Ox+1	
	5	Load	Earth terminal	5	Load	
CP-A08-M12 (NPN outputs)						
	1	24 V DC	Operating voltage	1	24 V DC	- - Note The consuming devices/load must be supplied with a 24 V operating voltage via pin 1.
	2	FE (earth)	Earth terminal	2	FE (earth)	
	3	n.c.	Not connected	3	n.c.	
	4	Ox	Output	4	Ox+1	

* Ox = Output x

Ordering data				
Designation			Type	Part No.
Power supply				
	Power supply socket, straight	for 1.5 mm^2	**NTSD-GD-9**	**18 493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm^2	**NTSD-WD-9**	**18 527**
		for 2.5 mm^2	**NTSD-WD-11**	**533 119**
Sensor plugs				
	Plug, straight socket, M12	5-pin, PG7	**SEA-M12-5GS-PG7**	**175 487**
		4-pin, PG7	**SEA-GS-7**	**18 666**
		4-pin, 2.5 mm^2 OD	**SEA-4GS-7-2,5**	**192 008**
	Plug for 2 sensor cables, M12, PG11	4-pin	**SEA-GS-11-DUO**	**18 779**
		5-pin	**SEA-5GS-11-DUO**	**192 010**
Cables				
	DUO cable	2x straight socket	**KM12-DUO-M8-GDGD**	**18 685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18 688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18 687**
	Connecting cable, M12, 4-pin, straight plug-straight socket	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
Mounting				
	Mounting for H-rail		**CP-TS-HS35**	**170 169**
User documentation				
	User documentation for input/output modules	German	**P.BE.-CPEA-DE**	**165 125**
		English	**P.BE.-CPEA-EN**	**165 225**
		French	**P.BE.-CPEA-FR**	**165 127**
		Italian	**P.BE.-CPEA-IT**	**165 157**
		Spanish	**P.BE.-CPEA-ES**	**165 227**
		Swedish	**P.BE.-CPEA-SV**	**165 257**

CPI installation system

Technical data – Output modules CP-A08-EL

FESTO

Function

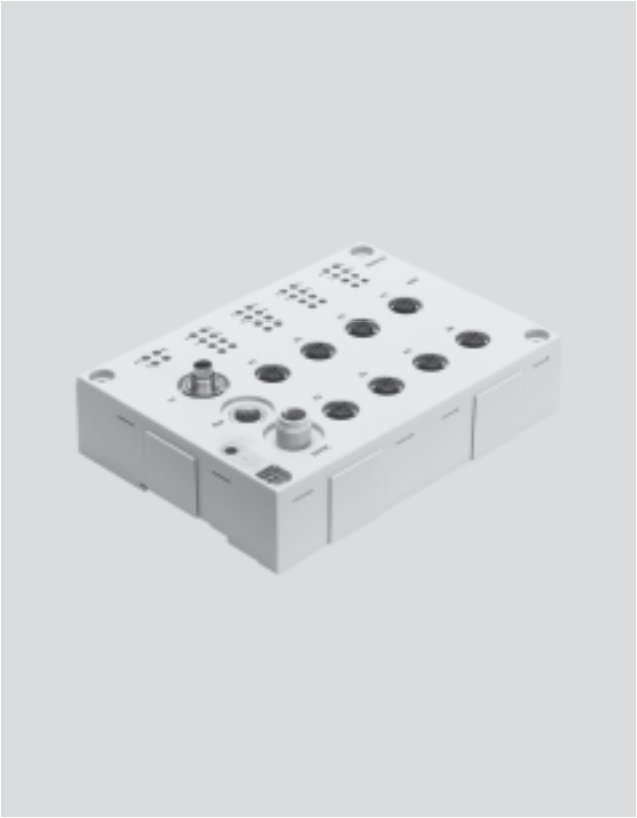
The electrical outputs actuate actuators such as individual valves, signal equipment and many more.

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



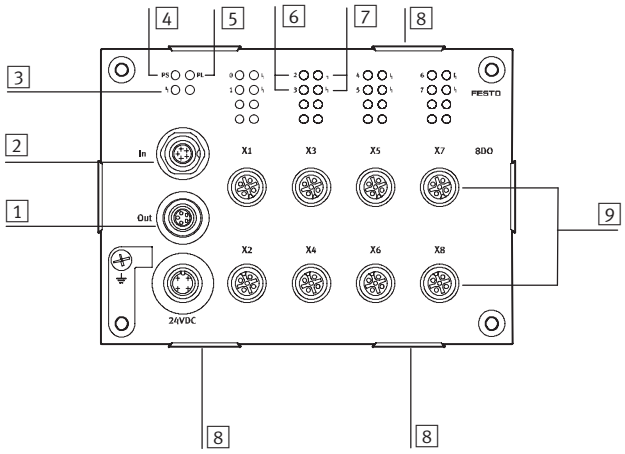
General technical data		
Type		**CP-A08-M12-EL-Z positive switching**
Part No.		**546 924**
No. of outputs		8
Allocation of outputs		Socket 1, 3, 5 and 7 with double allocation, socket 2, 4, 6 and 8 with single allocation
Sensor connection type		8x M12, 5-pin
Power supply 24 V DC		M12, 5-pin
Intrinsic 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
Fuse (short circuit)		Internal electronic fuse protection for each channel
Switching logic		PNP
Output characteristic curve		To ICE 1131-2
Galvanic isolation		None
Connection to bus node		Via pre-assembled cables
Diagnostics		CP communication
		Short circuit/overload per channel
		Undervoltage
Dimensions (LxWxH)	[mm]	143 x 104 x 30
Weight	[g]	260

Operating conditions			
Type			CP-A08-M12-EL-Z
Protection class to EN 60529			IP65 (when fully plugged in or fitted with protective cover)
Ambient temperature	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +70
Corrosion resistance class CRC[1)]			1
CE mark (see declaration of conformity)			In accordance with EU EMC directive
Certification			cULus listed (OL)

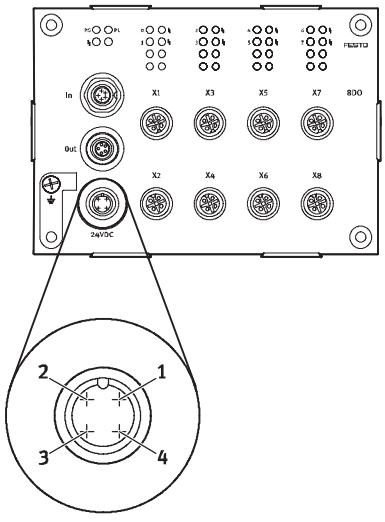
1) Corrosion resistance class 1 to Festo standard 940 070
Components requiring low corrosion resistance. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

Connection and display components

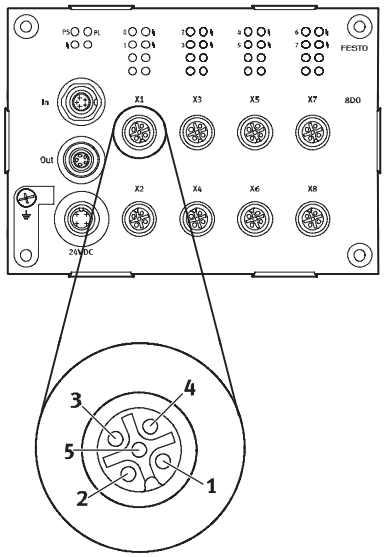
CP-A08-M12-EL-Z



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

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

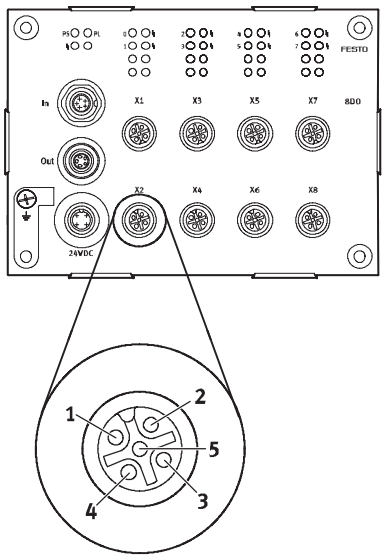
Pin allocation	Output 1, 3, 5 and 7		Description
	Pin	Signal	
CP-A08-M12-EL-Z (odd number of PNP outputs)			
	1	n.c.	Not connected
	2	Ox+1	Connected with pin 4 of output 2
	3	0 V	Reference potential
	4	Ox	Output
	5	FE	Earth terminal

Note

Two outputs can be connected to 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.

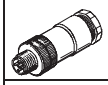
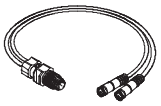
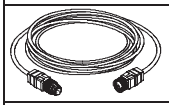
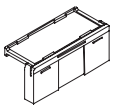
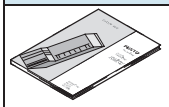
* Ox = Output x

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)			
	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			Type	Part No.
Plug connectors				
	Straight plug, M12	5-pin, PG7	**SEA-M12-5GS-PG7**	**175 487**
		4-pin, PG7	**SEA-GS-7**	**18 666**
		4-pin, 2.5 mm^2 O.D.	**SEA-4GS-7-2,5**	**192 008**
	Plug for 2 cables, M12, PG11	4-pin	**SEA-GS-11-DUO**	**18 779**
		5-pin	**SEA-5GS-11-DUO**	**192 010**
Connecting cables				
	DUO cable, 1x straight plug M12	2x straight socket M8	**KM12-DUO-M8-GDGD**	**18 685**
		1x straight socket M8 and 1x angled socket M8	**KM12-DUO-M8-GDWD**	**18 688**
		2x angled socket M8	**KM12-DUO-M8-WDWD**	**18 687**
	Connecting cable, M12, 4-pin, straight plug-straight socket	2.5 m	**NEBU-M12G4-K-2.5-M12G4**[1]	**539 052**
		5.0 m	**NEBU-M12G4-K-5-M12G4**[1]	**539 052**
Inscription label holders				
	Inscription label holders for EL modules, bag of 10		**ASCF-H-E2**	**547 473**
User documentation				
	User documentation for input/output modules	German	**P.BE.-CPEA-CL-DE**	**539 299**
		English	**P.BE.-CPEA-CL-EN**	**539 300**
		French	**P.BE.-CPEA-CL-FR**	**539 302**
		Italian	**P.BE.-CPEA-CL-IT**	**539 303**
		Spanish	**P.BE.-CPEA-CL-ES**	**539 301**
		Swedish	**P.BE.-CPEA-CL-SV**	**539 304**

1) Modular product, further information ➔ www.festo.com/catalogue/nebu

CPI installation system

Technical data – Output modules CP-A04

FESTO

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)

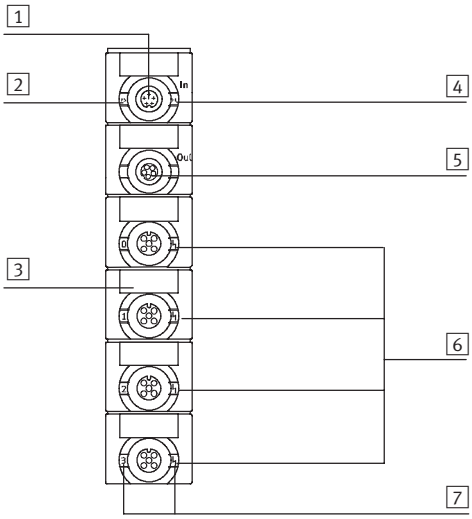
General technical data		
Type		**CP-A04-M12-CL**
		positive switching
Part No.		**538 790**
No. of outputs		4
Allocation of outputs		Socket 1 and 3 with double allocation, socket 2 and 4 with single allocation
Sensor connection type		4x M12, 5-pin
Power supply 24 V DC		From the bus node, basic unit, 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)
Material		Polybutylene terephthalate
Dimensions (LxWxD)	[mm]	151 x 30 x 25
Weight	[g]	165

Operating conditions			
Type			**CP-A04-M12-CL**
Protection class to EN 60529			IP65/IP67 (when fully plugged in or fitted with protective cap)
Ambient temperature	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +70
Corrosion resistance class CRC[1)]			1
CE mark (see declaration of conformity)			In accordance with EU EMC directive
Certification			cULus listed (OL)

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.

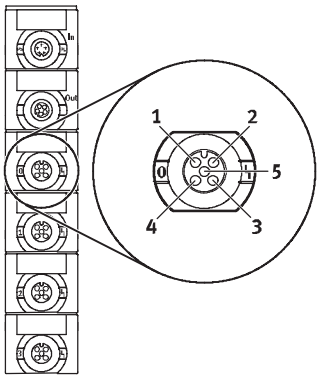
Connection and display components

CP-A04-M12-CL

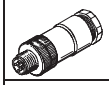
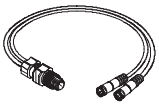
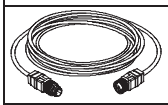
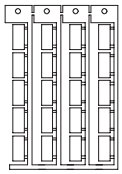
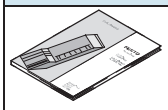


1 CP connection, incoming
2 Status LED (green)
3 Holder for inscription label (IBS 8x20)
4 Red LED for short circuit/overload indication
5 CP connection, outgoing
6 Output
7 Green LED for status display (one LED per output)

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

* Ox = Output x

Ordering data				
Designation			Type	Part No.
Sensor plugs				
	Plug, straight socket, M12	5-pin, PG7	**SEA-M12-5GS-PG7**	**175 487**
		4-pin, PG7	**SEA-GS-7**	**18 666**
		4-pin, 2.5 mm^2 O.D.	**SEA-4GS-7-2,5**	**192 008**
	Plug for 2 sensor cables, M12, PG11	4-pin	**SEA-GS-11-DUO**	**18 779**
		5-pin	**SEA-5GS-11-DUO**	**192 010**
Cables				
	DUO cable	2x straight socket	**KM12-DUO-M8-GDGD**	**18 685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18 688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18 687**
	Connecting cable, M12, 4-pin, straight plug-straight socket	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
Inscription labels				
	Inscription labels 8x20 mm in frames (20 pieces)		**IBS-8x20**	**539 388**
User documentation				
	User documentation for input/output modules	German	**P.BE.-CPEA-CL-DE**	**539 299**
		English	**P.BE.-CPEA-CL-EN**	**539 300**
		French	**P.BE.-CPEA-CL-FR**	**539 302**
		Italian	**P.BE.-CPEA-CL-IT**	**539 303**
		Spanish	**P.BE.-CPEA-CL-ES**	**539 301**
		Swedish	**P.BE.-CPEA-CL-SV**	**539 304**

CPI installation system

Technical data – MPA valve terminals

FESTO

- Flow rate
  MPA1: Up to 360 l/min
  MPA2: Up to 700 l/min

- Valve width
  MPA1: 10 mm
  MPA2: 21 mm

- Voltage
  24 V DC

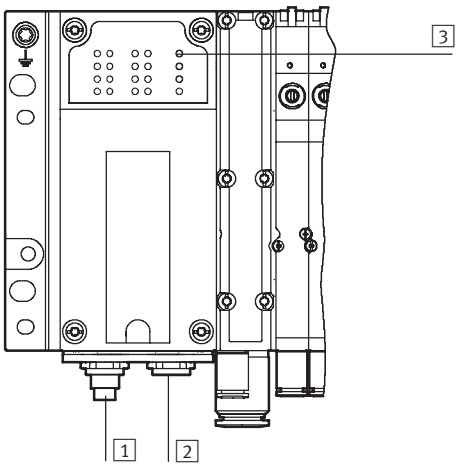
CPI interface for communication between an MPA valve terminal and a CPI master. It activates an MPA valve terminal with up to 32 solenoid coils on max. 32 valve positions.

General technical data			
Type			**MPA-CPI-VI**
Module No.			**546 280**
CP interface, incoming			Plug M9, 5-pin
CP interface, outgoing			Socket M9, 5-pin
Max. no. of solenoid coils			32
LED display (product-specific)	PS		Common message regarding power supply
	PL		Power supply for valves
	Symbol		Module fault
Nominal operating voltage		[V]	24 DC
Operating voltage range		[V]	24 DC ±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, polyamide
Dimensions			→ LEERER MERKER
Weight		[g]	200
Technical data on valves			→ 4 / 2.2-33

Operating conditions			
Protection class to EN 60529			IP65 (when fully plugged in or fitted with protective cover)
Ambient temperature	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +40
Corrosion resistance class CRC[1)]			1
CE mark (see declaration of conformity)			In accordance with EU EMC directive
Certification			cULus listed (OL)

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.

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			Type	Part No.
Valve terminal connection				
	Connecting cable WS-WD	0.25 m	**KVI-CP-3-WS-WD-0,25**	**540 327**
		0.5 m	**KVI-CP-3-WS-WD-0,5**	**540 328**
		2 m	**KVI-CP-3-WS-WD-2**	**540 329**
		5 m	**KVI-CP-3-WS-WD-5**	**540 330**
		8 m	**KVI-CP-3-WS-WD-8**	**540 331**
	Connecting cable GS-GD	2 m	**KVI-CP-3-GS-GD-2**	**540 332**
		5 m	**KVI-CP-3-GS-GD-5**	**540 333**
		8 m	**KVI-CP-3-GS-GD-8**	**540 334**

CPI installation system

Technical data – CPV-SC valve terminals

- Flow rate
  170 l/min
- Valve width
  10 mm
- Voltage
  24 V DC

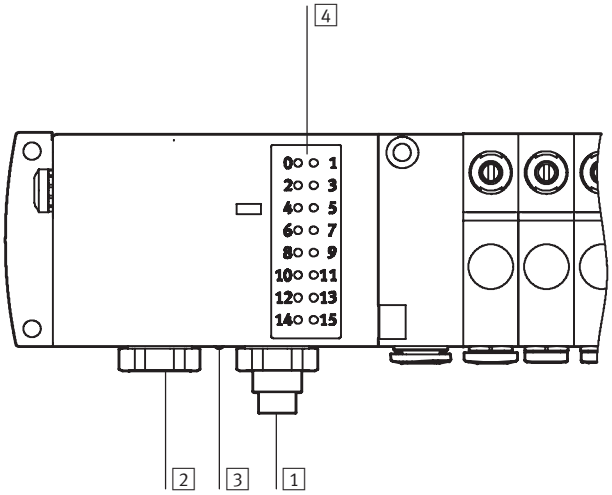
CPI interface for communication between a CPV-SC valve terminal and a CPI master. It activates a CPV-SC valve terminal with up to 16 solenoid coils.

General technical data			
Type			CPVSC1-AE16-CPI
Module No.			541 975
CP interface, incoming			Plug M9, 5-pin
CP interface, outgoing			Socket M9, 5-pin
Max. no. of solenoid coils			16
LED display (product-specific)			Status LED for CP communication
			Status LEDs for valves
Nominal operating voltage		[V DC]	24
Operating voltage range		[V DC]	20.4 ... 26.4
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]	Max. 100
Materials			Polymer
Dimensions			→ 4 / 3.1-29
Weight		[g]	150
Technical data on valves			→ 4 / 3.1-25

Operating conditions			
Protection class to EN 60529			IP40 (when fully plugged in or fitted with protective cover)
Ambient temperature	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +40
Corrosion resistance class CRC[1)]			1
CE mark (see declaration of conformity)			In accordance with EU EMC directive
Certification			cULus listed (OL)

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.

Connection and display components

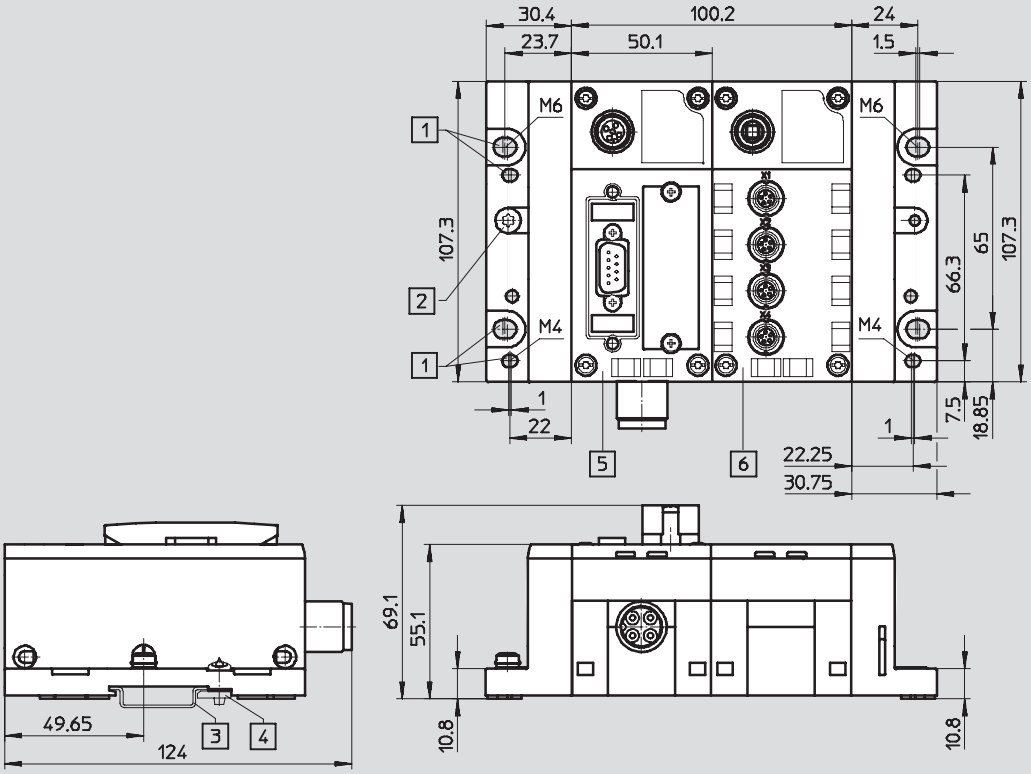


1 CP connection, incoming
2 CP connection, outgoing
3 Status LED for CP communication
4 Status LEDs for valves

Ordering data – Accessories				
Designation			Type	Part No.
Valve terminal connection				
	Connecting cable WS-WD	0.25 m	**KVI-CP-3-WS-WD-0,25**	**540 327**
		0.5 m	**KVI-CP-3-WS-WD-0,5**	**540 328**
		2 m	**KVI-CP-3-WS-WD-2**	**540 329**
		5 m	**KVI-CP-3-WS-WD-5**	**540 330**
		8 m	**KVI-CP-3-WS-WD-8**	**540 331**
	Connecting cable GS-GD	2 m	**KVI-CP-3-GS-GD-2**	**540 332**
		5 m	**KVI-CP-3-GS-GD-5**	**540 333**
		8 m	**KVI-CP-3-GS-GD-8**	**540 334**

Dimensions – Fieldbus node/control block Download CAD data ➔ **www.festo.com/en/engineering**

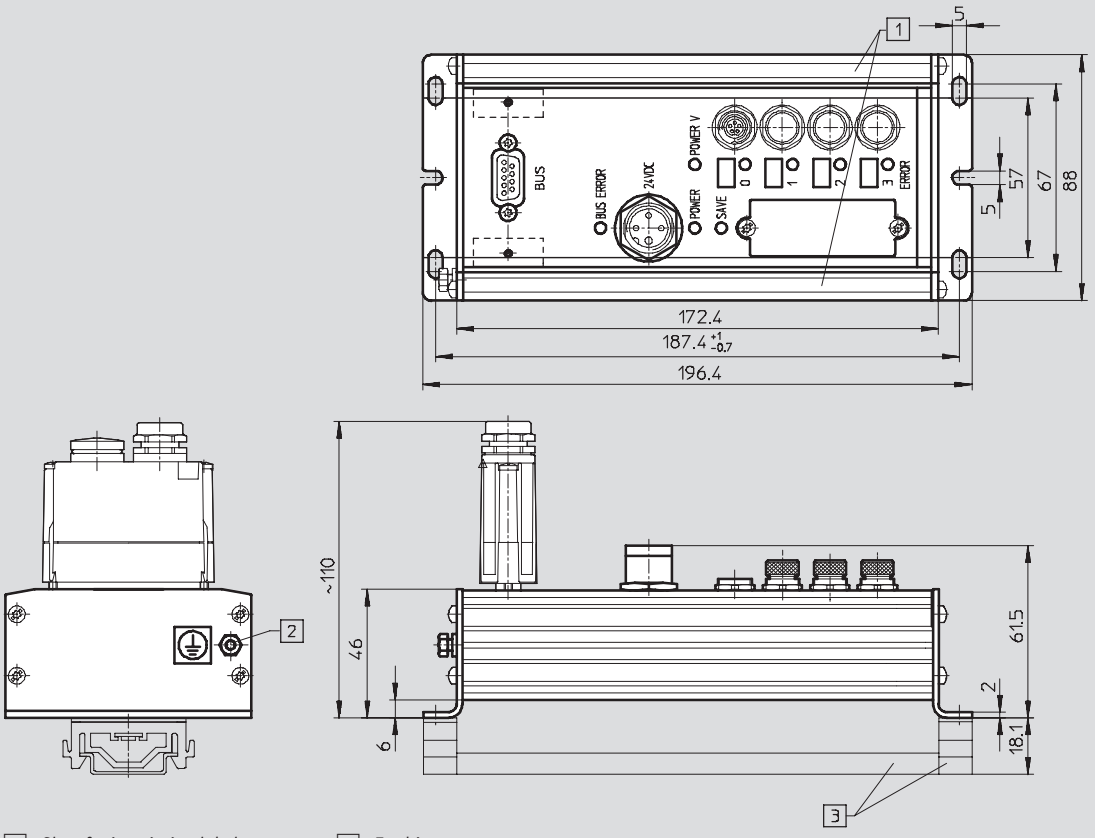
CPX-FB... /CPX-FEC and CPX-CP-4-FB



1 Mounting holes
2 Earthing screw
3 H-rail
4 H-rail mounting
5 CPX fieldbus node or CPX control block
6 CPX-CP interface

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

Fieldbus node



1 Slots for inscription label
2 Earthing screw
3 H-rail with support base

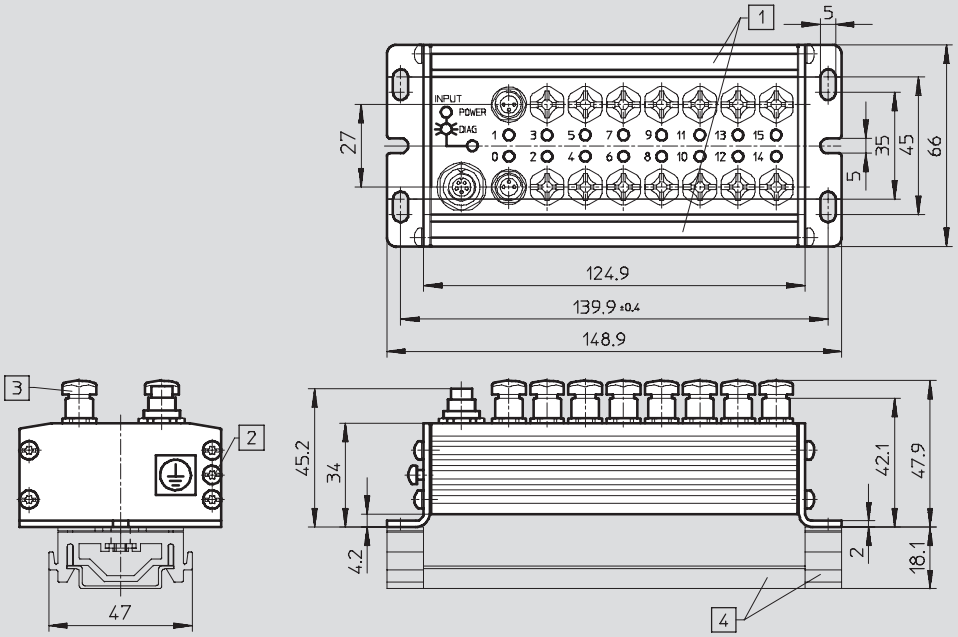
Note

The dimensions are valid for the fieldbus node types:
- CP-FB05-E
- CP-FB06-E
- CP-FB11-E
- CP-FB13-E

Different height ~110 (incl. fieldbus plug) for
- CP-FB06-E with M23
- CP-FB11-E with M12
- CP-FB13-E with 2x M12

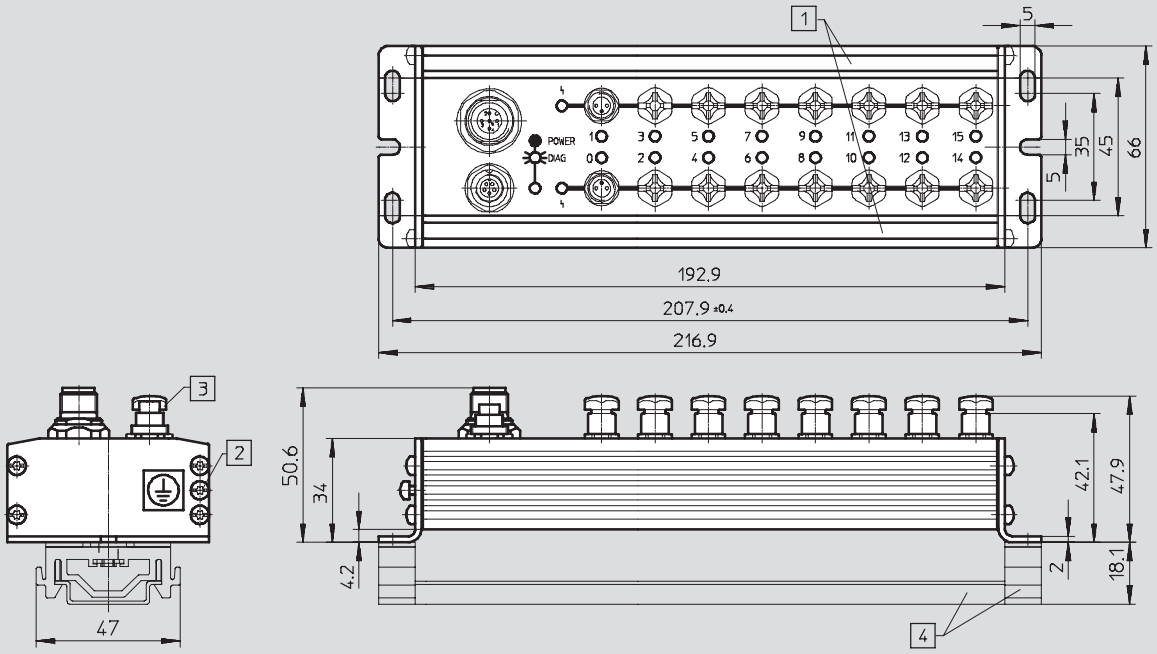
Dimensions – Sturdy input modules Download CAD data ➔ **www.festo.com/en/engineering**

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

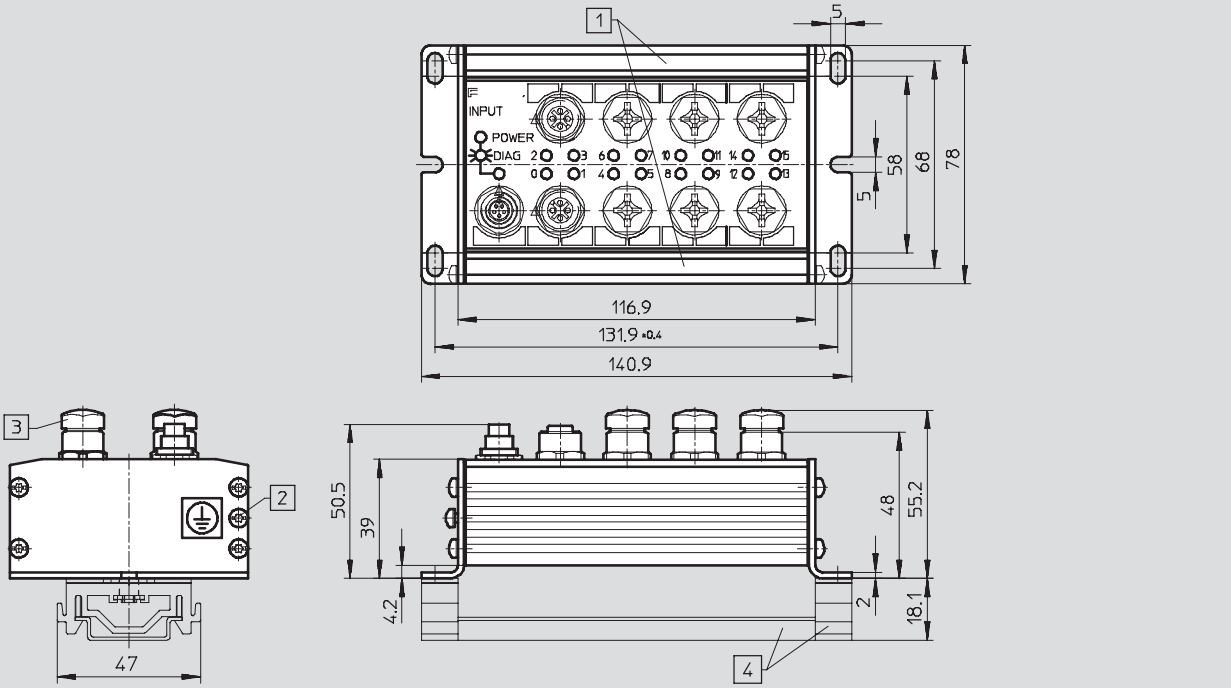
CP-E16-M8-Z



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

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

CP-E16-M12x2-5POL/CP-E16N-M12x2



1 Slots for inscription label

2 Earthing screw M3

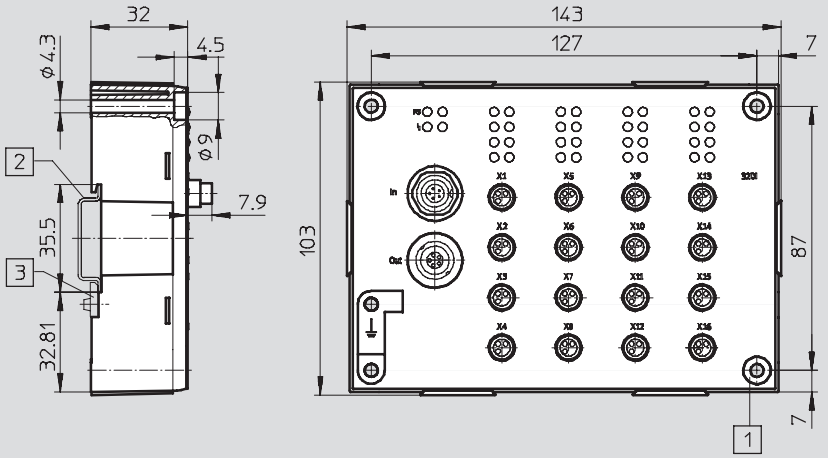
3 Protective cap (included in scope of delivery)

4 H-rail with support base

Dimensions – Economical input modules

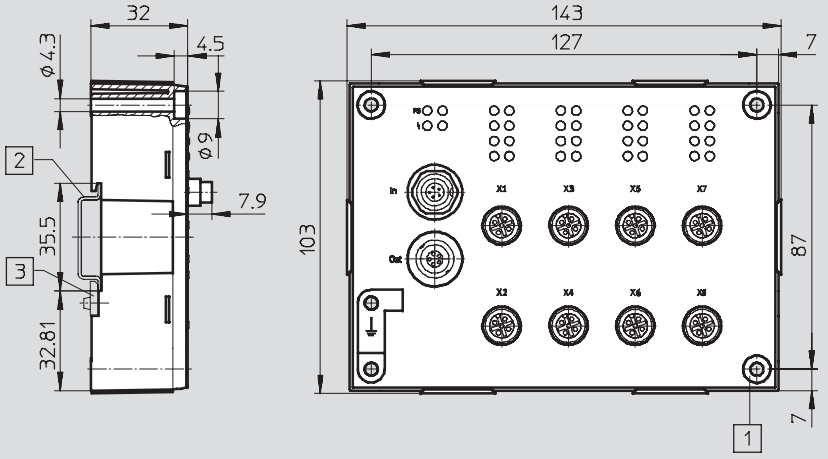
Download CAD data ➔ **www.festo.com/en/engineering**

CP-E16-M12-M8-EL



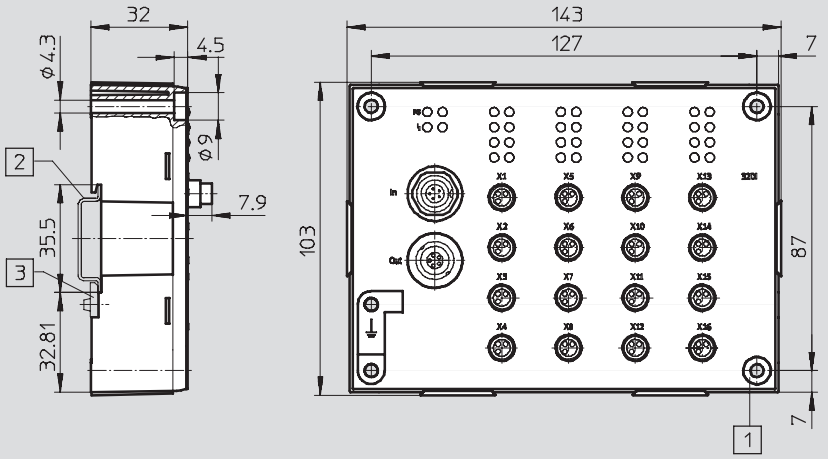
1 Through-hole for surface mounting
2 H-rail
3 Mounting kit for H-rail (included in the scope of delivery)

CP-E16-M12-M12-EL



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

CP-E32-M8-EL

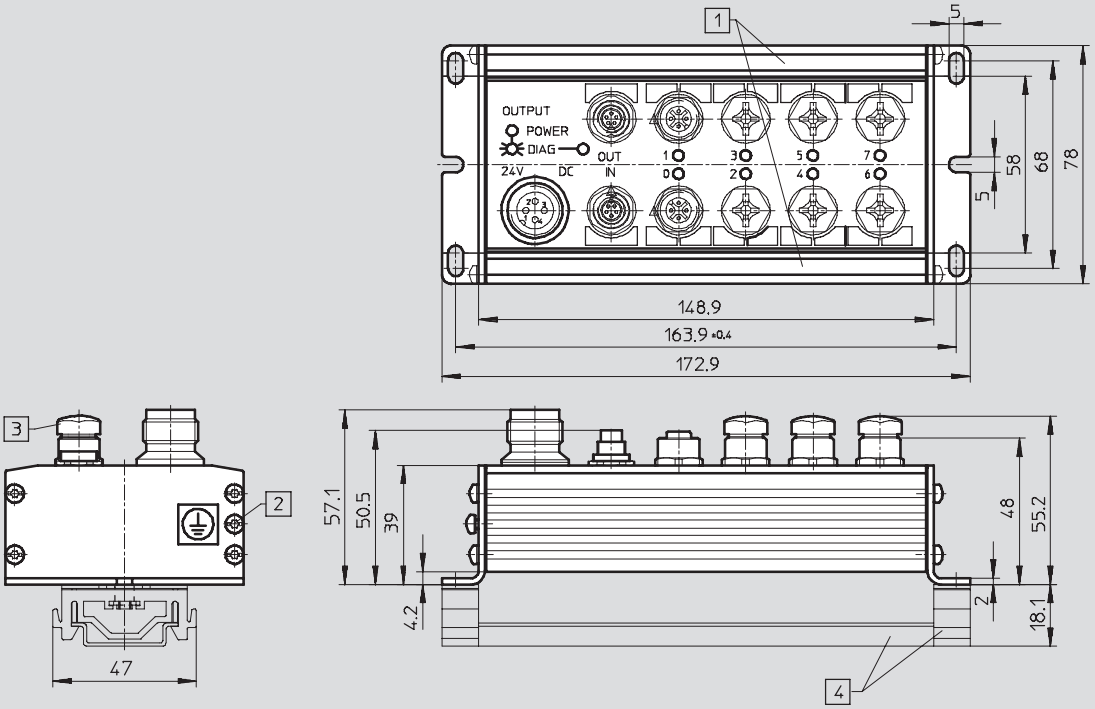


1 Through-hole for surface mounting
2 H-rail
3 Mounting kit for H-rail (included in the scope of delivery)

Dimensions – Sturdy output modules

Download CAD data ➔ **www.festo.com/en/engineering**

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



1 Slots for inscription label

2 Earthing screw M3

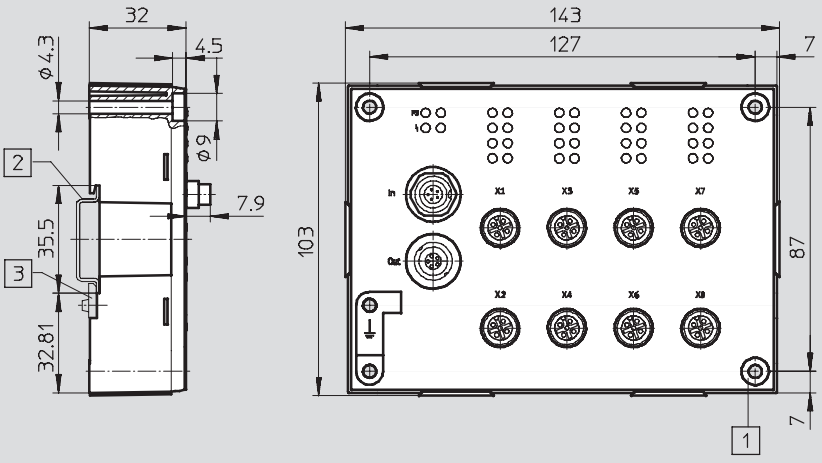
3 Protective cap (included in scope of delivery)

4 H-rail with support base

Dimensions – Economical output module

Download CAD data ➔ **www.festo.com/en/engineering**

CP-A08-M12-EL-Z



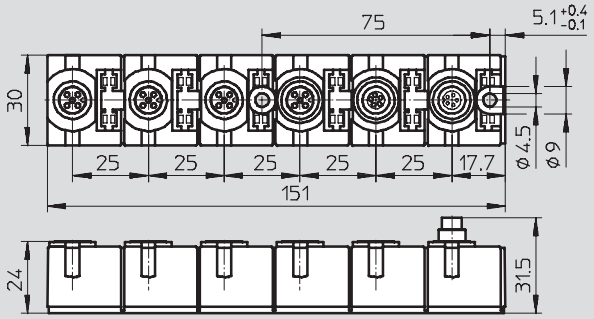
1 Through-hole for surface mounting

2 H-rail

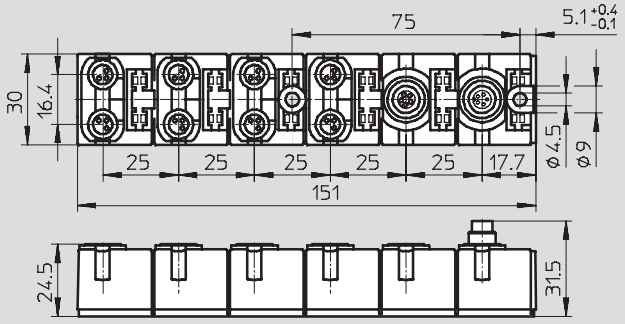
3 Mounting kit for H-rail (included in the scope of delivery)

Dimensions – Compact CP modules Download CAD data ➔ **www.festo.com/en/engineering**

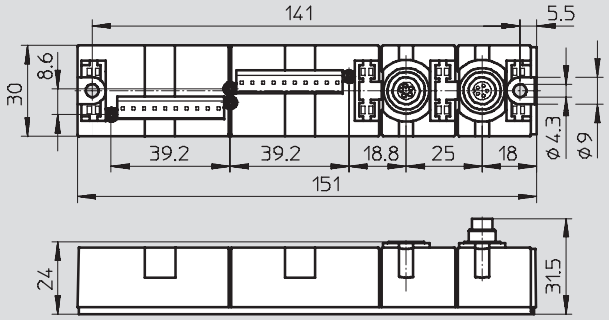
CP-E08-M12-CL/CP-A04-M12-CL



CP-E08-M8-CL



CP-E16-KL-CL



CPI installation system

Order processing information

FESTO

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
➔ 4 / 4.6-93

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 are two ways of placing an order for the electrical CPI installation system:

- By completing the order form on the following pages
- 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 electrical CP modules, the CP cables and the required accessories are ordered via the ordering procedure for the CPI installation system
➔ 4 / 4.6-88

The valve terminals are configured separately:

- CPV valve terminal CPV10/14/18-VI-FB-....
  ➔ 4 / 2.1-60
- MPA valve terminals MPA-CPI-VI
  ➔ 4 / 2.2-1
- CPV-SC valve terminals CPVSC1-AE16-CPI
  ➔ 4 / 3.1-1
- CPA valve terminals CPA10/14-IFB-CP....
  ➔ 4 / 2.1-120

CPI installation system

Ordering data – Modular products

FESTO

M Mandatory data					O Options
Module No.	**CP electrics**		**Fieldbus node or control block**	**Fieldbus connection socket/ plug**	**Supply**
539 641	CTEC		CPX, C06, C11, C13, C14, C23, C32, C33, CT3	GA, GB, GC, GD, GE, GF, GO, GI, GL, GM, GP, GH, GZ	S, QP, QR
Ordering example					
539 641	**CTEC**	–	**C06**	**GC**	**S**
1	**2**		**3**	**4**	**5**

Ordering table

				Condi-tions	Code		Enter code
M	1	Module No.	**539 641**				
	2	CP electrics	CPI installation system		**CTEC**		CTEC
	3	Fieldbus node or control block	Place holder for CPX terminal, CP interface		**-CPX**		
			Fieldbus node for Interbus + CP interface	1	**-C06**		
			Fieldbus node for DeviceNet + CP interface		**-C11**		
			Fieldbus node for Profibus DP + CP interface		**-C13**		
			Fieldbus node for CANopen + CP interface		**-C14**		
			Fieldbus node for CC-Link + CP interface		**-C23**		
			Fieldbus nodes for Ethernet/IP + CP interface		**-C32**		
			Fieldbus node for Profinet 2x M12 + CP interface		**-C33**		
			Front End Controller (FEC Remote Control or IO) + CP interface		**-CT3**		
O	4	Fieldbus connection socket/plug	Fieldbus connection 2x M12, 5-pin for DeviceNet/CAN	2	**GA**		
			Connection set, 5-pin clamp for DeviceNet/CAN	2	**GB**		
			Without node-specific connection technology		**GC**		
			Fieldbus plug IP65 for DNet/CAN	2	**GD**		
			Sub-D fieldbus plug for Profibus DP	3	**GE**		
			Fieldbus connection 2x M12, 5-pin RK for Profibus DP	3	**GF**		
			Connection block 2x M12, B-coded, 5-pin for Profibus DP	3	**GO**		
			Connection set 9-pin, Sub-D for Interbus	4	**GI**		
			Fieldbus connection screw terminal for CC	5	**GL**		
			Fieldbus connection IP65, 9-pin, Sub-D for CC-Link	5	**GM**		
			Connection block 2x M12 for Interbus	4	**GP**		
			Connection set, IP65, RJ45 for Ethernet	6	**GH**		
			Straight plug, M12, D-coded for Ethernet	7	**GZ**		
	5	Supply	Interlinking block with system supply	8	**S**		
			Interlinking block with system supply, 7/8", 5-pin	8	**QP**		
↓			Interlinking block with system supply, 7/8", 4-pin	8	**QR**		

1 **C06** Observe maximum number of inputs/outputs (96/96)
2 **GA, GB, GD** Only with fieldbus node (3) C11, C14
3 **GE, GF, GO** Only with fieldbus node (3) C13
4 **GI, GP** Only with fieldbus node (3) C06
5 **GL, GM** Only with fieldbus node (3) C23
6 **GH** Only with Front End Controller (3) CT3
7 **GZ** Only with fieldbus node (3) C32, C33
8 **S, QP, QR** Not with place holder (3) CPX.
Must be chosen with fieldbus node (3) C06, C11, C13, C14, C23, CT3, C32, C33

Transfer order code

539 641	**CTEC**	–		
1	**2**	**3**	**4**	**5**

M **Mandatory data**

String 1 ... 4

6 Connecting cable 1 ... 4 per string: Q, R, S, K, L, U, V, W

7 Module 1 ... 4 per string: E, M, GE, F, GF, GN, A, GA, BE, BD, BF, BM, O, P, X, Y

String 1	String 2	String 3	String 4
Q A	K GE	K E	

6 + 7

Ordering table

				Conditions	Code		Enter code
M		String 1 ... 4		9	-		-
	6	Connecting cable 1 ... 4 per string	Connecting cable WS-WD, 0.25 m	10	Q		Enter the equipment selected in the order code
			Connecting cable WS-WD, 0.5 m	10	R		
			Connecting cable WS-WD, 2 m	10	S		
			Connecting cable WS-WD, 5 m	10	K		
			Connecting cable WS-WD, 8 m	10	L		
			Connecting cable GS-GD, 2 m	10	U		
			Connecting cable GS-GD, 5 m	10	V		
			Connecting cable GS-GD, 8 m	10	W		
	7	Module 1 ... 4 per string	Sturdy 16-fold input module, 16x M8, PNP	11 12	E		
			Sturdy 16-fold input module, 16x M8, Z	11 12	M		
			Compact 8-fold input module, 8x M8, PNP, 3-pin	11	GE		
			Sturdy 16-fold input module, 8x M12, PNP, 5-pin	11 12	F		
			Compact 8-fold input module, 4x M12, PNP, 5-pin	11	GF		
			Compact 16-fold input module, IP20, terminals	11	GN		
			Sturdy 8-fold output module, PNP, 5-pin	11	A		
			Compact 4-fold output module, 4x M12, PNP, 5-pin, 8 outputs	11	GA		
			Economical 32-fold input module, 16x M8, PNP, 4-pin	11	BE		
			Economical 16-fold input module, 16x M8, PNP, 3-pin	11	BD		
			Economical 16-fold input module, 8x M12, PNP, 5-pin	11	BF		
			Economical 8-fold output module, 8x M12, PNP, 5-pin	11	BM		
			Place holder for valve terminal with 8 solenoid coils (8 outputs) (MPA-CPI)	11	O		
			Place holder for valve terminal with 16 solenoid coils (16 outputs) (CPV, CPA, CPV-SC and MPA-CPI)	11	P		
			Place holder for valve terminal with 24 solenoid coils (24 outputs) (MPA-CPI)	11	X		
			Place holder for valve terminal with 32 solenoid coils (32 outputs) (MPA-CPI)	11	Y		

9 **String 1 ... 4** The first string at least must be equipped
The strings must be continuously equipped.
The following applies per string: max. 32 inputs, max. 32 outputs.
The following critical equipment also applies: 1x module (7) E, M, F; 1x A

10 **Q, R, S, K, L, U, V, W**
A module (7) must always be selected to follow the connecting cable (6).
Total length per string: max. 10 m

11 **E, M, GE, F, GF, GN, A, GA, BE, BD, BF, BM, O, P, X, Y**
A connecting cable (6) must always be selected for a module (7).

12 **E, M, F** No subsequent module selection (7) permitted

Transfer order code

String 1	String 2	String 3	String 4

6 + 7

0 Options →	
User documentation	**Accessories**
D, E, F, S, I, V	...S, ...W, ...P, ...D, ...R, ...C, ...X, ...K, ...H, U, ...L, ...N, ...M, ...I, ...J, T, Z, ...GS, ...GT
– **E** (8)	+ **5S 4H 2M** (9)

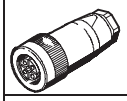
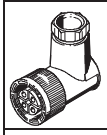
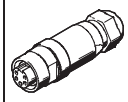
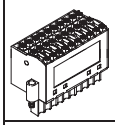
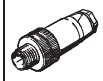
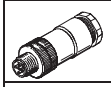
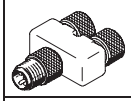
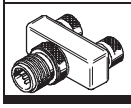
Ordering table

				Conditions	Code		Enter code
0	8	User documentation	German		-D		
			English		-E		
			French		-F		
			Spanish		-S		
			Italian		-I		
			Swedish		-V		
	9	Accessories			+		+
		Sensor plug, M12 straight, Pg7	1 ... 99	13	...S		
		4-pin, for 2.5 mm cable O.D.	1 ... 99	13	...W		
		5 pin, Pg7	1 ... 99	13	...P		
		Cable socket straight, Pg9, 5-pin	1 ... 99	14	...D		
		Sensor plug, M8 straight, solderable	1 ... 99	15	...R		
		straight, screw-in	1 ... 99	15	...C		
		DUO plug, M12 (2 cable outlets)	1 ... 99	16	...X		
		5-pin, for 2 cables	1 ... 99	16	...K		
		H-rail mounting set for modules	1 ... 99	17	...H		
		H-rail mounting for CPX modules	1	18	U		
		Connection set CP-E16-KL-CL (2x tension-spring sockets, LED)	1 ... 99	19	...L		
		Power supply socket straight (for 1.5 mm²)	1 ... 99	18 20	...N		
		straight (for 2.5 mm²)	1 ... 99	18 20	...M		
		angled (for 1.5 mm²)	1 ... 99	18 20	...I		
		angled (for 2.5 mm²)	1 ... 99	18 20	...J		
		10 inscription labels for CP-E...-EL, CP-A08-M12-EL-Z	1	21	T		
		20 inscription labels for CP-E...-CL, CP-A04-M12-CL	1	22	Z		
		Socket, for operating voltage straight, 7/8" 5-pin	1 ... 99	18 23	...GS		
		straight, 7/8" 4-pin	1 ... 99	18 24	...GT		

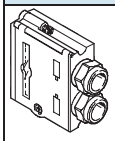
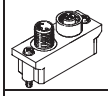
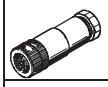
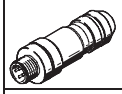
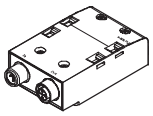
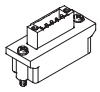
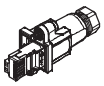
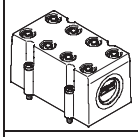
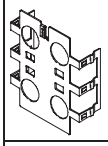
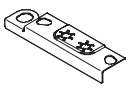
13 **S, W, P** Only with module (7) F, A, GF, GA
14 **D** Only with module (7) M
15 **R, C** Only with module (7) E, M, GE
16 **X, K** Only with module (7) F, A, GF, GA
17 **H** Only with module (7) E, M, F, A
18 **U, N, M, I, J, GS, GT** Only with fieldbus node (3) C06, C11, C13, C14, C23, CT3,C32, C33
19 **L** Only with module (7) GN
20 **N, M, I, J** Only with connecting cable (6) S
21 **T** Only with module (7) BE, BD, BF, BM
22 **Z** Only with module (7) GE, GA, GF, GN
23 **GS** Only with supply (5) QP
24 **GT** Only in combination with supply (5) QR

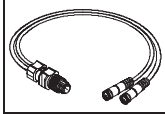
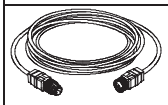
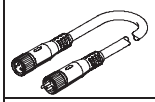
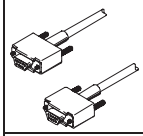
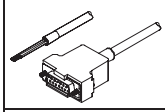
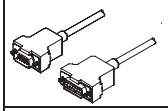
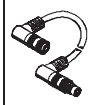
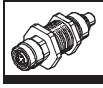
Transfer order code

–		+	
8		9	

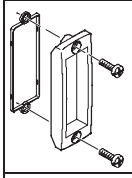
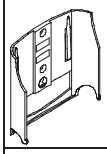
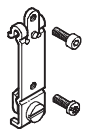
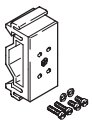
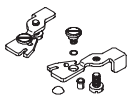
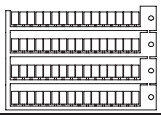
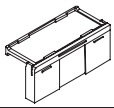
Ordering data				
Designation			Type	Part No.
Plug connectors – Power supply				
	Power supply socket, straight	for 1.5 mm²	**NTSD-GD-9**	**18 493**
		for 2.5 mm²	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm²	**NTSD-WD-9**	**18 527**
		for 2.5 mm²	**NTSD-WD-11**	**533 119**
	Power supply socket for CPX system supply	7/8" connection, 5-pin	**NECU-G78G5-C2**	**543 107**
		7/8" connection, 4-pin	**NECU-G78G4-C2**	**543 108**
Connection sets for power supply and sensors				
	Plug, screw-in tension-spring socket	3-row, 30-pin	**PS1 SAC30**	**197 161**
	Plug, screw-in tension-spring socket with LED	3-row, 30-pin	**PS1-SAC31-30POL+LED**	**197 162**
Sensor plugs				
	Plug M12, straight socket	5-pin, PG7	**SEA-M12-5GS-PG7**	**175 487**
		4-pin, PG7	**SEA-GS-7**	**18 666**
		4-pin, 2.5 mm² O.D.	**SEA-4GS-7-2,5**	**192 008**
	Plug M8, straight	3-pin, solderable	**SEA-GS-M8**	**18 696**
		3-pin, screw-in	**SEA-3GS-M8-S**	**192 009**
	Plug M12 for 2 sensor cables, PG11	4-pin	**SEA-GS-11-DUO**	**18 779**
		5-pin	**SEA-5GS-11-DUO**	**192 010**
	Push-in T-connector	2x socket M8, 3-pin 1x plug M8, 4-pin	**NEDU-M8D3-M8T4**	**544 391**
	Push-in T-connector	2x socket M12, 5-pin 1x plug M12, 4-pin	**NEDU-M12D5-M12T4**	**541 596**

Ordering data

Designation		Type	Part No.
Plug connectors – Fieldbus connection			
 Sub-D plug for INTERBUS	Incoming	FBS-SUB-9-BU-IB-B	532 218
	Outgoing	FBS-SUB-9-GS-IB-B	532 217
Sub-D plug for DeviceNet/CANopen		FBS-SUB-9-BU-2x5POL-B	532 219
Sub-D plug for Profibus DP		FBS-SUB-9-GS-DP-B	532 216
Sub-D plug for CC-Link		FBS-SUB-9-GS-2x4POL-B	532 220
Sub-D plug		FBS-SUB-9-GS-1x9POL-B	534 497
 Bus connection M12 adapter (B-coded) for Profibus DP		FBA-2-M12-5POL-RK	533 118
Bus connection Micro Style 2xM12 for DeviceNet/CANopen		FBA-2-M12-5POL	525 632
 Socket M12 for Micro Style connection		FBSD-GD-9-5POL	18 324
Plug M12 for Micro Style connection		FBS-M12-5GS-PG9	175 380
 Bus connection M12x1, 4-pin (D-coded) for Ethernet		NECU-M-S-D12G4-C2-ET	543 109
 Connection block M12 adapter (B-coded) for Profibus DP		CPX-AB-2-M12-RK-DP	541 519
Connection block M12 adapter (B-coded) for INTERBUS		CPX-AB-2-M12-RK-IB	534 505
 Bus connection Open Style for 5-pin terminal strip for DeviceNet/CANopen		FBA-1-SL-5POL	525 634
 Bus connection 5-pin terminal strip for DeviceNet/CANopen		FBSD-KL-2x5POL	525 635
 Bus connection screw terminal for CC-Link		FBA-1-KL-5POL	197 962
 RJ45/plug		FBS-RJ45-8-GS	534 494
Accessories – Fieldbus connection			
 Threaded sleeve, 4 pieces		UNC4-40/M3x6	533 000
 Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable through-feeds M9 – 1 cable through-feed for multi-pin plug		AK-8KL	538 219
 Screening plate for M12 connections		CPX-AB-S-4-M12	526 184
 Earthing element for right-hand/left-hand end plates (5 pieces)		CPX-EPFE-EV	538 892

Ordering data				
Designation			Type	Part No.
Connecting cables				
	DUO cable M12-2xM8, 4-pin/2x3-pin	2x straight socket	**KM12-DUO-M8-GDGD**	**18 685**
		2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18 688**
		2x angled socket	**KM12-DUO-M8-WDWD**	**18 687**
	Connecting cable M8-M8, straight plug-straight socket	0.5 m	**KM8-M8-GSGD-0,5**	**175 488**
		1.0 m	**KM8-M8-GSGD-1**	**175 489**
		2.5 m	**KM8-M8-GSGD-2,5**	**165 610**
		5.0 m	**KM8-M8-GSGD-5**	**165 611**
	Extension cable M12-M12, 5-pin, straight plug-straight socket	1.5 m	**KV-M12-M12-1,5**	**529 044**
		3.5 m	**KV-M12-M12-3,5**	**530 901**
	Connecting cable M12-M12, 4-pin, straight plug-straight socket	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
	Connecting cable M12-M12, 4-pin, straight plug-angled socket	1.0 m	**KM12-M12-GSWD-1-4**	**185 499**
	Modular system for connecting cables		**NEBU-...** ➔ **www.festo.com/catalogue/nebu**	**–**
	Programming cable		**KDI-PPA-3-BU9**	**151 915**
	Connecting cable FED, pre-assembled at one end		**FEC-KBG7**	**539 642**
	Connecting cable FED, pre-assembled at both ends		**FEC-KBG8**	**539 643**
Connecting cable – CP modules				
	Connecting cable WS-WD, angled plug-angled socket	0.25 m	**KVI-CP-3-WS-WD-0,25**	**540 327**
		0.5 m	**KVI-CP-3-WS-WD-0,5**	**540 328**
		2 m	**KVI-CP-3-WS-WD-2**	**540 329**
		5 m	**KVI-CP-3-WS-WD-5**	**540 330**
		8 m	**KVI-CP-3-WS-WD-8**	**540 331**
	Connecting cable GS-GD, straight plug-straight socket	2 m	**KVI-CP-3-GS-GD-2**	**540 332**
		5 m	**KVI-CP-3-GS-GD-5**	**540 333**
		8 m	**KVI-CP-3-GS-GD-8**	**540 334**
	Connector plug for CP cable (control cabinet implementation)		**KVI-CP-3-SSD**	**543 252**

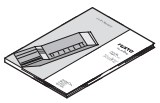
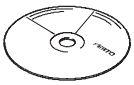
Ordering data

Designation		Type	Part No.
Protective caps			
 Inspection cover, transparent		**AK-SUB-9/15-B**	**533 334**
 Cover for RJ45 connection		**AK-Rj45**	**534 496**
 Protective cap for sealing unused sockets (10 pieces)	for M8 connections	**ISK-M8**	**177 672**
	M9	**FLANSCHDOSE SER.712**	**356 684**
	for M12 connections	**ISK-M12**	**165 592**
Mounting attachments			
 Retainer CPX-MMI		**CPX-MMI-1-H**	**534 705**
 Mounting for H-rail, CPX-MMI		**CPX-MMI-1-NRH**	**536 689**
 Mounting for H-rail, CP modules		**CP-TS-HS35**	**170 169**
 Mounting for H-rail		**IBGH-03-4,0**	**18 649**
Inscription labels			
 Inscription labels 6x10 mm in frames (64 pieces)		**IBS-6x10**	**18 576**
 Inscription labels 8x20 mm in frames (20 pieces) for compact modules (CP-...-CL)		**IBS-8x20**	**539 388**
 Inscription label holders for EL modules, bag of 10		**ASCF-H-E2**	**547 473**

Ordering data – Documentation

Designation			Type	Part No.
	User documentation for bus node CPX-FB6	German	**P.BE-CPX-FB6-DE**	**526 433**
		English	**P.BE-CPX-FB6-EN**	**526 434**
		Spanish	**P.BE-CPX-FB6-ES**	**526 435**
		French	**P.BE-CPX-FB6-FR**	**526 436**
		Italian	**P.BE-CPX-FB6-IT**	**526 437**
		Swedish	**P.BE-CPX-FB6-SV**	**526 438**
	User documentation for bus node CPX-FB11	German	**P.BE-CPX-FB11-DE**	**526 421**
		English	**P.BE-CPX-FB11-EN**	**526 422**
		Spanish	**P.BE-CPX-FB11-ES**	**526 423**
		French	**P.BE-CPX-FB11-FR**	**526 424**
		Italian	**P.BE-CPX-FB11-IT**	**526 425**
		Swedish	**P.BE-CPX-FB11-SV**	**526 426**
	User documentation for bus node CPX-FB13	German	**P.BE-CPX-FB13-DE**	**526 427**
		English	**P.BE-CPX-FB13-EN**	**526 428**
		Spanish	**P.BE-CPX-FB13-ES**	**526 429**
		French	**P.BE-CPX-FB13-FR**	**526 430**
		Italian	**P.BE-CPX-FB13-IT**	**526 431**
		Swedish	**P.BE-CPX-FB13-SV**	**526 432**
	User documentation for bus node CPX-FB14	German	**P.BE-CPX-FB14-DE**	**526 409**
		English	**P.BE-CPX-FB14-EN**	**526 410**
		Spanish	**P.BE-CPX-FB14-ES**	**526 411**
		French	**P.BE-CPX-FB14-FR**	**526 412**
		Italian	**P.BE-CPX-FB14-IT**	**526 413**
		Swedish	**P.BE-CPX-FB14-SV**	**526 414**
	User documentation for bus node CPX-FB23	German	**P.BE-CPX-FB23-DE**	**526 403**
		English	**P.BE-CPX-FB23-EN**	**526 404**
	User documentation for bus node CPX-FB32	German	**P.BE-CPX-FB32-DE**	**693 134**
		English	**P.BE-CPX-FB32-EN**	**693 135**
		Spanish	**P.BE-CPX-FB32-ES**	**693 136**
		French	**P.BE-CPX-FB32-FR**	**693 137**
		Italian	**P.BE-CPX-FB32-IT**	**693 138**
		Swedish	**P.BE-CPX-FB32-SV**	**693 139**
	User documentation for bus node CPX-FB33	German	**P.BE-CPX-PNIO-DE**	**548 759**
		English	**P.BE-CPX-PNIO-EN**	**548 760**
		Spanish	**P.BE-CPX-PNIO-ES**	**548 761**
		French	**P.BE-CPX-PNIO-FR**	**548 762**
		Italian	**P.BE-CPX-PNIO-IT**	**548 763**
		Swedish	**P.BE-CPX-PNIO-SV**	**548 764**
	User documentation for control block CPX-FEC	German	**P.BE-CPX-FEC-DE**	**538 474**
		English	**P.BE-CPX-FEC-EN**	**538 475**
		Spanish	**P.BE-CPX-FEC-ES**	**538 476**
		French	**P.BE-CPX-FEC-FR**	**538 477**
		Italian	**P.BE-CPX-FEC-IT**	**538 478**
		Swedish	**P.BE-CPX-FEC-SV**	**538 479**

Ordering data – Documentation

Designation			Type	Part No.
	User documentation for CPX CP interface	German	**P.BE-CPX-CP-DE**	**539 293**
		English	**P.BE-CPX-CP-EN**	**539 294**
		Spanish	**P.BE-CPX-CP-ES**	**539 295**
		French	**P.BE-CPX-CP-FR**	**539 296**
		Italian	**P.BE-CPX-CP-IT**	**539 297**
		Swedish	**P.BE-CPX-CP-SV**	**539 298**
	User manual for operator unit CPX-MMI-1	German	**P.BE-CPX-MMI-1-DE**	**534 824**
		English	**P.BE-CPX-MMI-1-EN**	**534 825**
		French	**P.BE-CPX-MMI-1-FR**	**534 827**
		Italian	**P.BE-CPX-MMI-1-IT**	**534 828**
		Swedish	**P.BE-CPX-MMI-1-SV**	**534 829**
		Spanish	**P.BE-CPX-MMI-1-ES**	**534 826**
	User documentation for sturdy input/output modules	German	**P.BE.-CPEA-DE**	**165 125**
		English	**P.BE.-CPEA-EN**	**165 225**
		French	**P.BE.-CPEA-FR**	**165 127**
		Italian	**P.BE.-CPEA-IT**	**165 157**
		Spanish	**P.BE.-CPEA-ES**	**165 227**
		Swedish	**P.BE.-CPEA-SV**	**165 257**
	User documentation for compact input/output modules	German	**P.BE.-CPEA-CL-DE**	**539 299**
		English	**P.BE.-CPEA-CL-EN**	**539 300**
		French	**P.BE.-CPEA-CL-FR**	**539 302**
		Italian	**P.BE.-CPEA-CL-IT**	**539 303**
		Spanish	**P.BE.-CPEA-CL-ES**	**539 301**
		Swedish	**P.BE.-CPEA-CL-SV**	**539 304**
	System description	German	**P.BE-CPSYS-DE**	**165 126**
		English	**P.BE-CPSYS-EN**	**165 226**
		French	**P.BE-CPSYS-FR**	**165 128**
		Italian	**P.BE-CPSYS-IT**	**165 158**
		Spanish	**P.BE-CPSYS-ES**	**165 228**
		Swedish	**P.BE-CPSYS-SV**	**165 258**
Software				
	Programming software	German	**FST4.1DE**	**537 927**
		English	**FST4.1GB**	**537 928**