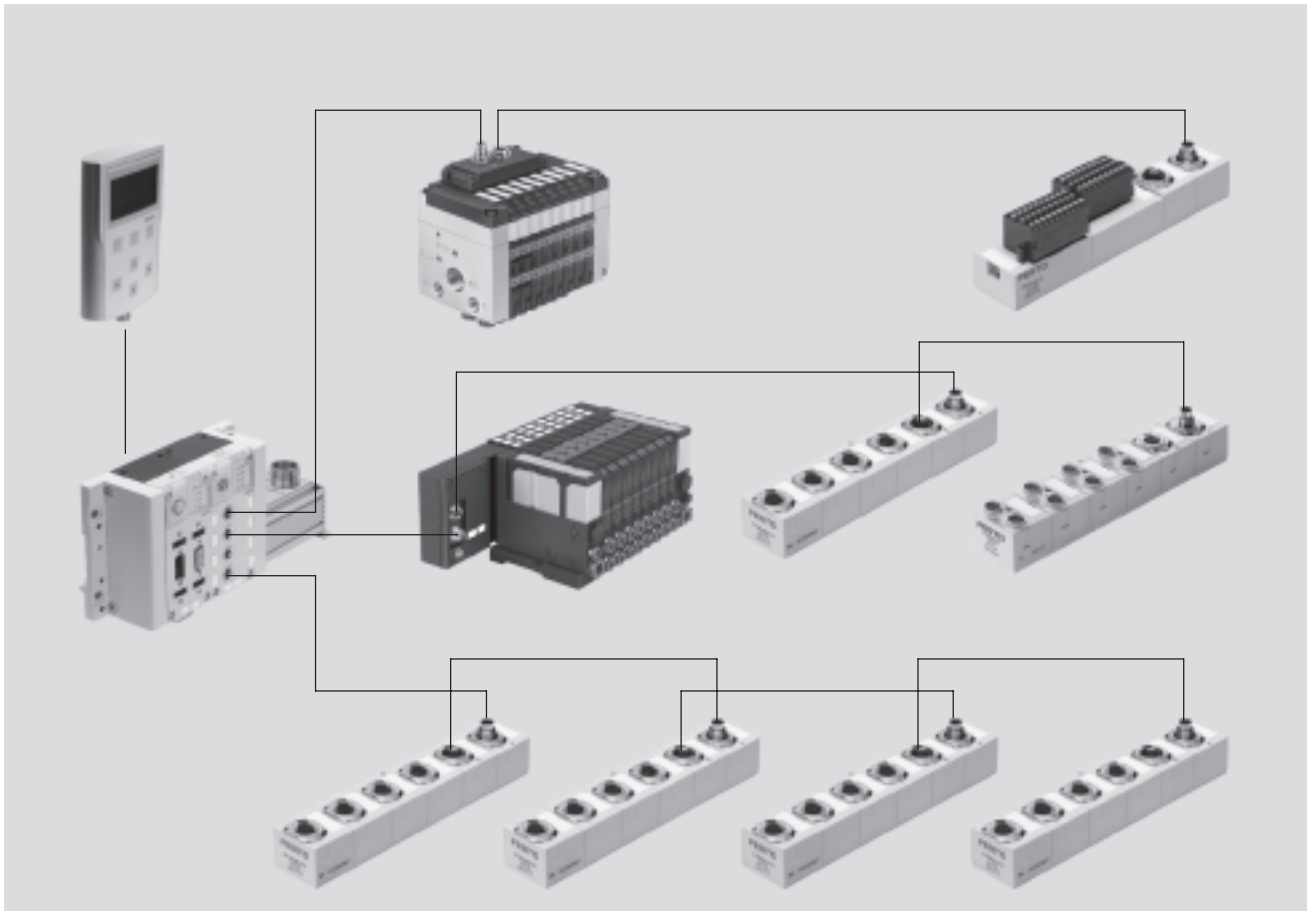# CPI installation system

- Decentralised installation system for short cycle times

- Central fieldbus connection for optimum cost-effectiveness

- Open to a wide range of fieldbus protocols

- Diagnosis via LEDs and fieldbus

- Max. 64 inputs and 64 outputs can be connected (incl. solenoid coils)

- Power supply and bus connection via the same line

- Programmable with integrated controller

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

Fieldbus systems/electrical peripherals
CP installation system

4.6

CPI installation system

Key features

Innovative

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

Sturdy

- Electrical accessories to IP65
- Proven valve terminals CPV (compact) and CPA (modular 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

Flexible

- A number of CP interfaces can be combined under one fieldbus node
- Four CP strings up to 10 m in length permit optimum decentralisation
- Max. 32 inputs and 32 outputs/ valves per string
- Valves available:
  – Compact CPV10/14/18 with flow rates of 400, 800, 1600 l/min
  – Modular CPA 10/14 with flow rates of 350, 650 l/min
- Input modules with 8 … 16 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 diagnosis and status LEDs
- Diagnosis 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 sub-base 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
- 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.
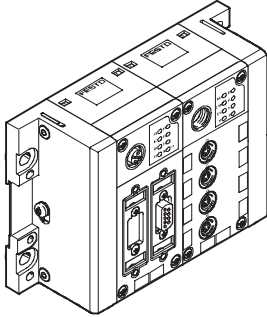

Fieldbus systems/electrical peripherals
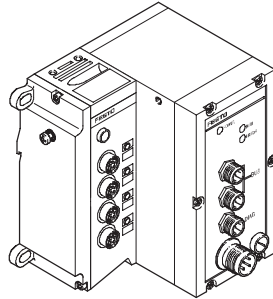CP installation system

4.6
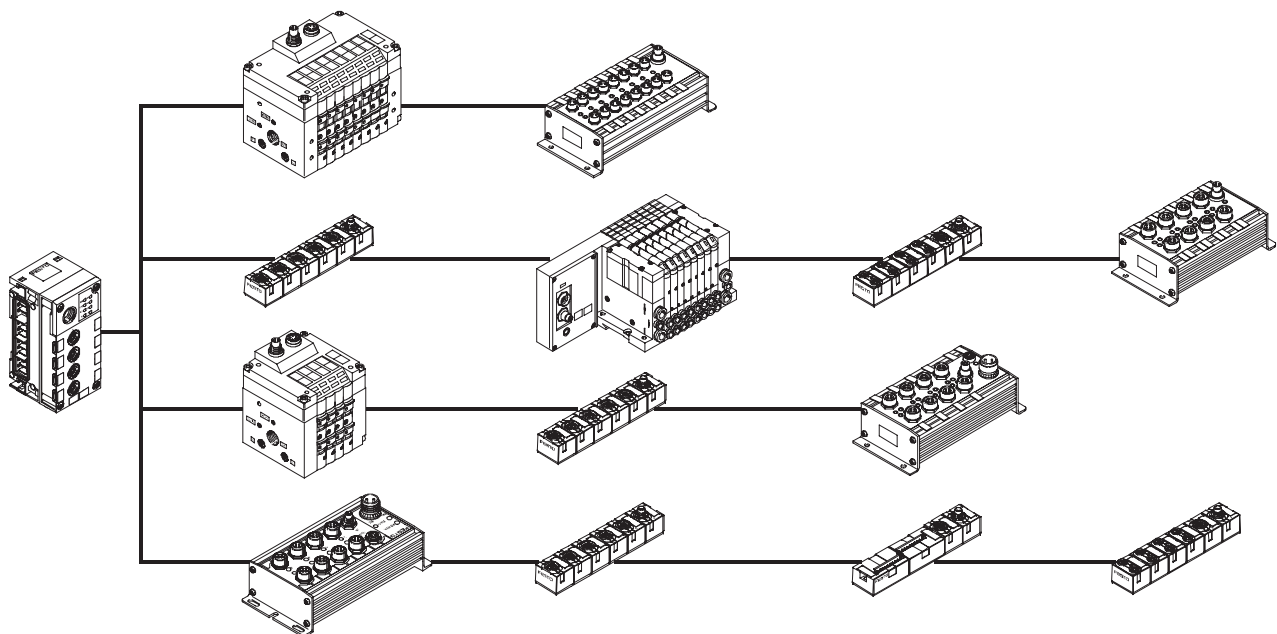
CPI installation system

Key features

Fieldbus/control block	Fieldbus/control block	CP fieldbus node	Valve terminal
CPX with CP interface	Type 03/04 with CP interface		with CP string extension
CPX-...	ISF3-03	CP-E	CPV, CPA-SC, CPV-SC, CDVI-DN
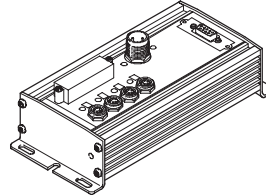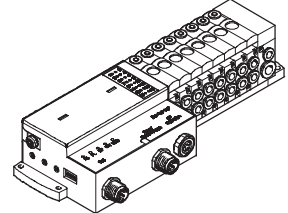
CPI installation system
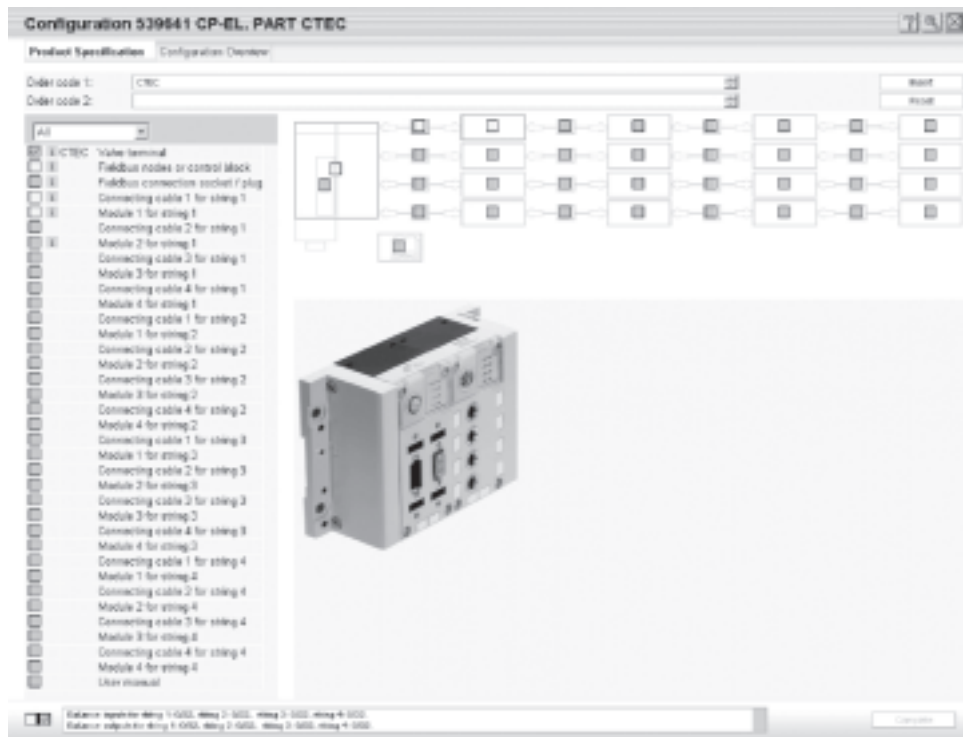
Ordering system

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

A configurator is available to help you select a suitable CPI system. This makes it much easier for you to find the right product.

To order components from the CPI system series, type CTEC, use the order code.

Ordering system for type 55E
➔ 4 / 3.1-30

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, select the online version of the digital product catalogue from the "Products" submenu: this will bring you directly to the home page for the Pneumatic Catalogue. Activate the "Direct Search" menu.

Here you can specify a "Module No." (e.g. 539641), the "Type" (e.g. CTEC) or "Article name" (e.g. CP electrics) to find your "Search result". Click on the blue shopping basket to complete the selected product according to your specifications (this does not initiate an order). You will then be prompted to configure the product.

Select "Configurator".
You can then configure the CPI system step by step (from the top down) according to your requirements. Select the "Finish" menu to continue on with the ordering process.
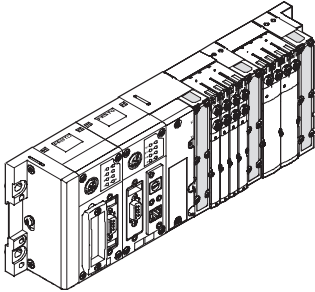
Fieldbus systems/electrical peripherals
CP installation system

4.6

CPI installation system

Peripherals overview

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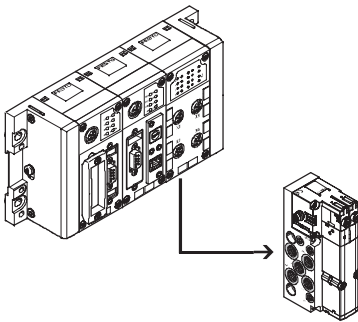
Advantages
- Can be positioned directly at the actuator, can even be integrated
- Short tube length to the actuator permits short switching times
- Optimum pneumatic timing and performance possible

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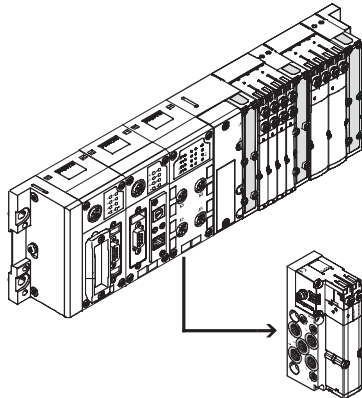- More complex electrical installation

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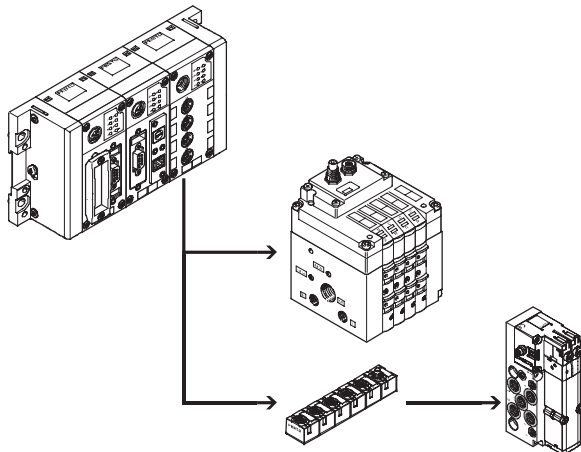

Advantages

- 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)
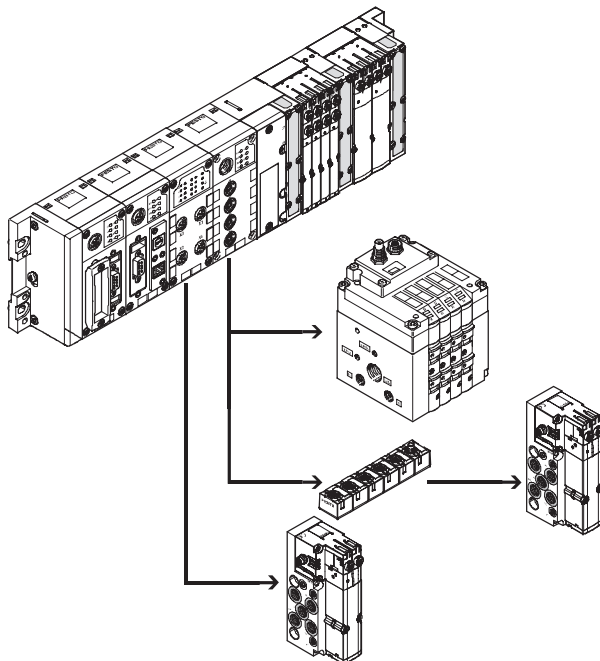

Advantages

- CPI system with reduced installation complexity for groups of actuators/sensors
- Customised 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 loads

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, reduced installation complexity with concentrated and widely separated actuators
- Permits the implementation of an optimum electrical and pneumatic control loop system
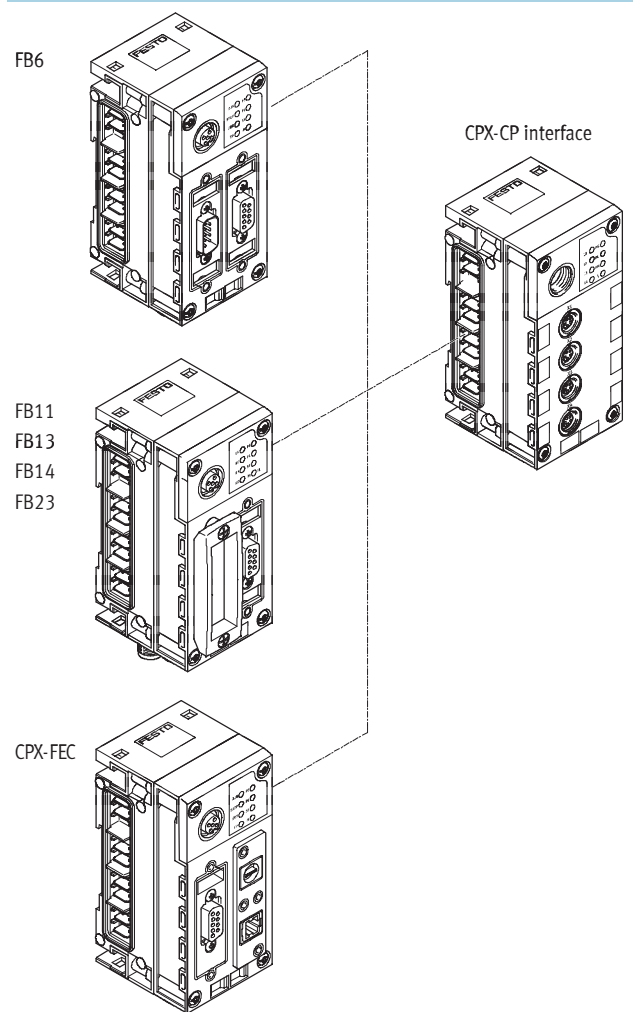
Disadvantages

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

Fieldbus systems/electrical peripherals
CP installation system

4.6

CPI installation system

Peripherals overview

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

Fieldbus node

Different bus nodes are used for integration in the control systems of various manufacturers.
The CPI system can therefore be operated on over 90% of the most commonly used fieldbus systems.

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

Control block

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

- Ethernet
- TCP/IP
- Web

Overview	Bus protocol/fieldbus node	Special features
FB6	**Interbus**	
	FB6	• Up to 96 digital inputs/outputs • 6 analogue inputs/outputs
	DeviceNet	
CPX-CP interface	FB11	• Up to 512 digital inputs/outputs • 18 analogue inputs/outputs
	Profibus-DP	
	FB13	• Up to 512 digital inputs/outputs • 18 analogue inputs/outputs
FB11 FB13 FB14 FB23	**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
CPX-FEC	**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 • A number of CP interfaces can be connected • Data pre-processing or autonomous control of the CPX terminal possible

CPI installation system

Peripherals overview

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

As an added advantage, the CPI system offers extremely user-friendly access possibilities via the CPX fieldbus node and the CPX-FEC:

• Data pre-processing
• Diagnosis 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

Fieldbus Direct

Special feature	Application	Characteristics of Fieldbus Direct	

The Fieldbus Direct product range is the most compact way of connecting valves to a fieldbus. The fieldbus node is directly integrated in the electrical actuation of the valve terminal and therefore takes up only a minimal amount of space.

Fieldbus Direct is a system for the compact connection of a valve terminal to 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 CP installation system to be used.

- 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 diagnosis and condition monitoring

- ⎎ - Note

The range of functions and combination options of CPV, CPV-SC, CPA-SC, CDVI valves are described in detail in
➜ 4 / 3.1-1 Valve terminal CPV-SC
➜ 4 / 3.1-27 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 and CPA 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:
- 16 input signals
- 16 output signals for output modules 24 V DC or solenoid coils
- Logic and sensor supply for the output modules

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

CPI installation system

Connection options

Fieldbus Direct with CP string extension

CPV valve terminal

Fieldbus
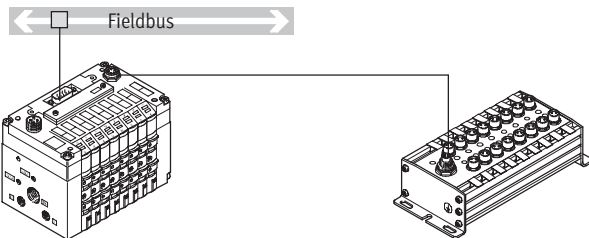
- Max. 16 valves in 8 valve slices
- Size 10, 14 and 18 mm
- 16 inputs M8, M12 or spring-loaded terminals each with sensor supply

Further information
→ 4 / 4.7-2

CPA-SC

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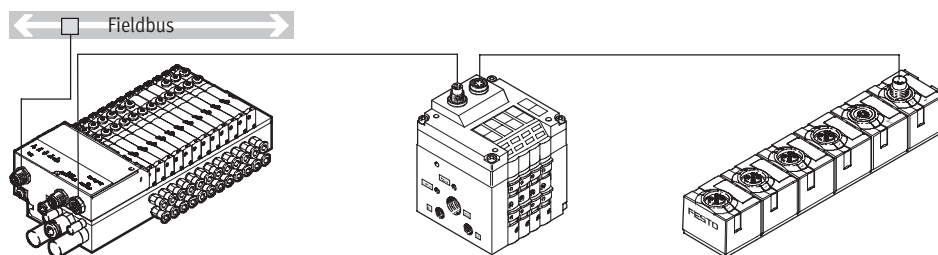
- 4 to 24 valve positions
- DeviceNet connection
- Profibus-DP
- 4 to 32 solenoid coils

Further information
→ 4 / 3.1-27

CPV-SC

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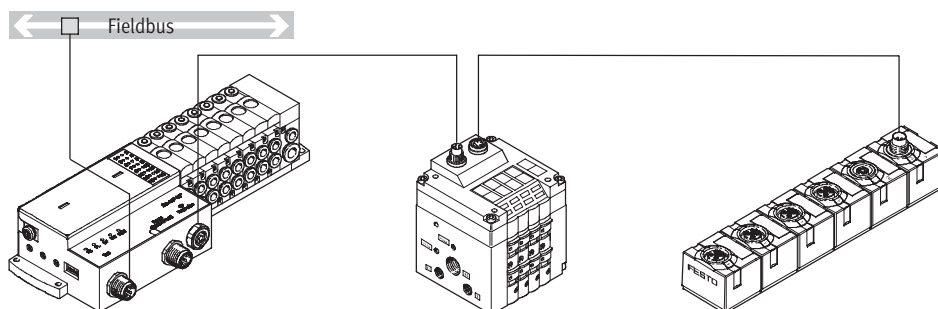
- 4 to 16 valve positions
- DeviceNet connection
- Profibus-DP
- 4 to 16 solenoid coils

Further information
→ 4 / 3.1-1

CDVI-DN

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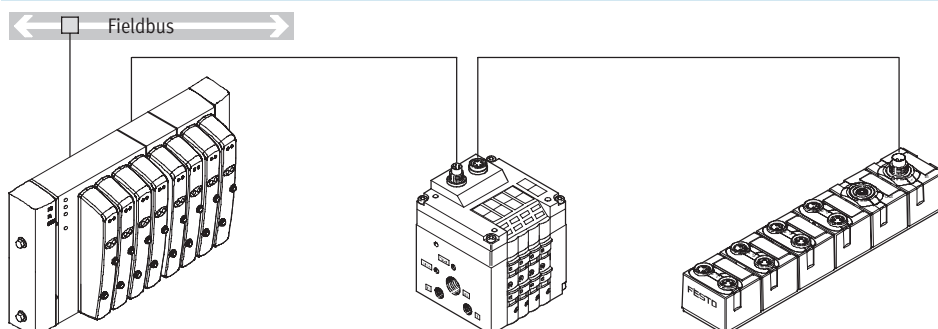
- 4, 6, 8 or 12 valve positions
- DeviceNet connection
- 4 to 24 solenoid coils

Further information
→ 4 / 3.4-2

Fieldbus systems/electrical peripherals
CP installation system

4.6

CPI installation system

Connection options

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 allows the functions and components of the CP installation system to be used.

Characteristics

- 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 traversing movements 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 permit 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 expansion 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 output modules
- Load voltage supply for the valve terminals
- Logic supply for the output module

- ⬛ - Note

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

Axis controller SPC200 with CP interface

← Fieldbus →

- 4 or 6 function cards
- Max. 64 inputs and 64 outputs via fieldbus
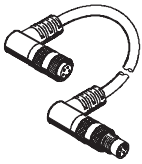- DeviceNet, Interbus or Profibus connection

Further information
→ Volume 5

CPI installation system

Connection options

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

KVI-CP-3-...

- 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

- ┋ - Note

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

CP input/output modules in sturdy and compact design or as 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 standards or application:
- M12-5-pin
- M8-3-pin
- 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 for selection:

- 16 inputs
- 8 inputs
- 8 outputs
- 4 outputs
- CPV with 4, 6 or 8 valve slices (max. 16 valves)
- CPA with 2 ... 16 valves

Valve terminals with CP interface			
CPV valve terminal			
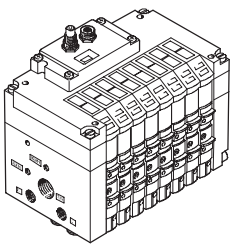
CPV10
CPV14
CPV18

- Max. 16 valves in 8 valve slices
- Width 10, 14, 18 mm
- CP functionality

Further information
→ 4 / 2.1-2 Valve terminal CPV

CPA valve terminal			

CPA10
CPA14

- Max. 16 valves
- Width 10, 14 mm
- CP functionality

Further information
→ 4 / 2.1-88 Valve terminal CPA

Fieldbus systems/electrical peripherals
CP installation system

4.6

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 provide the option of repair or replacement of the internal electronic components.

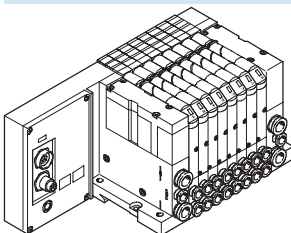CP-E...Z or output modules have a separate load voltage supply, which means less load on the CP interface and CP cable and more power for the

connected consuming devices. This also permits 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.
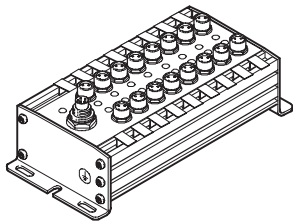
CP input modules of sturdy design
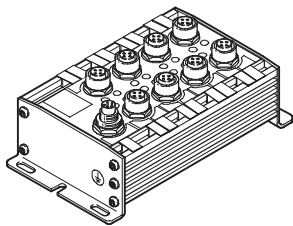
	CP-E16-M12x2-5POL CP-E16N-M12x2-5POL	• 16 inputs 24 V DC • Signal status display via 16 LEDs • Operating status display • CP functionality	• M12 plug, double allocation • 1x M9 CP connection • PNP/NPN, IP65
	CP-E16-M8 CP-E16N-M8	• 16 inputs 24 V DC • Signal status display via 16 LEDs • Operating status 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	• Electrical isolation through additional power supply • M8 plug, single allocation • 1x M9 CP connection • Separate sensor supply • PNP/NPN, IP65
	CP-E16-KL-IP20-Z	• 2x 8 inputs 24 V DC • Signal status display via 16 LEDs • Operating status display • CP functionality	• Screw terminal or tension-spring sockets • 1x M9 CP connection • Separate sensor supply • PNP/NPN, IP20
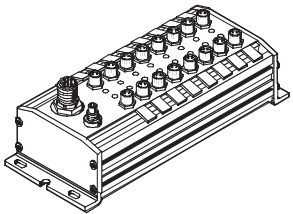
CP output modules of sturdy design
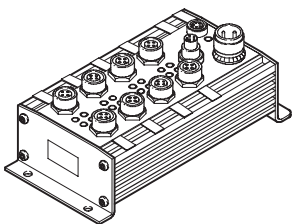
	CP-A08-M12-5POL CP-A08N-M12	• 8 outputs 24 V DC • Output signal display via 8 LEDs • Operating status display • M12 plug, single allocation • CP functionality	• 2x M9 CP connection • Separate load voltage • Outputs resistant to overloads and short circuits • PNP/NPN, IP65

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 compact design

In addition to the sturdy CP input/output modules there is the new 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: modules with tension spring terminals 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:
– CP/CPI system
– CPV, CPV-SC, CPA-SC, CDVI
– CPX-CP interface

Application:
• The modules can be positioned closer to the actuators thanks to the smaller dimensions.
• Same function, configuration and commissioning as conventional sturdy CP modules.
• The compact CP modules and the CP modules previously available can be operated together on a string.

• Functions of the CPI system. The maximum number of modules per CP string is thus changed as follows:
  – CPI system: max. 4 modules or max. 32 inputs and 32 outputs
  – CP system, Fieldbus Direct (CPV Direct), CPV-SC/CPA-SC, CDVI: 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
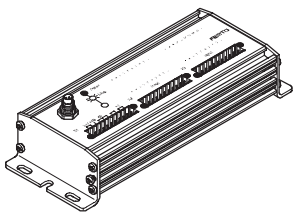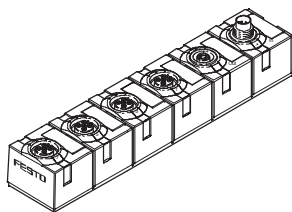• Operating status display
• CPI functionality

• 8x M8 plug, 3-pin, single allocation
• 2x M9 CP connection
• PNP, IP65/67
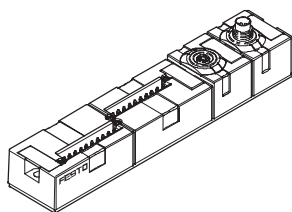
CP-E16-KL-CL

• 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
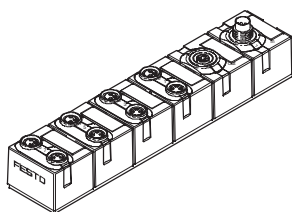• PNP, IP20

CP output modules of compact design
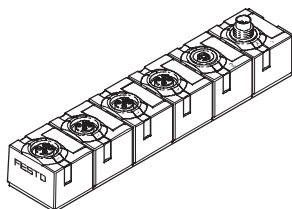
CP-A04-M12x2-CL

• 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

Fieldbus systems/electrical peripherals
CP installation system

4.6

CPI installation system

FESTO

H-rail mounting

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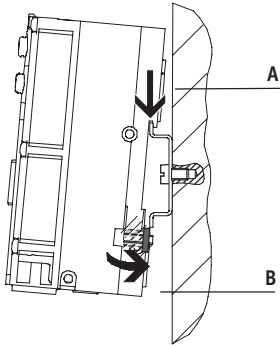
The H-rail mounting is formed in the reverse profile of the CPX interlinking blocks. The CPX terminal can be attached to the H-rail using the H-rail mounting.

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

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

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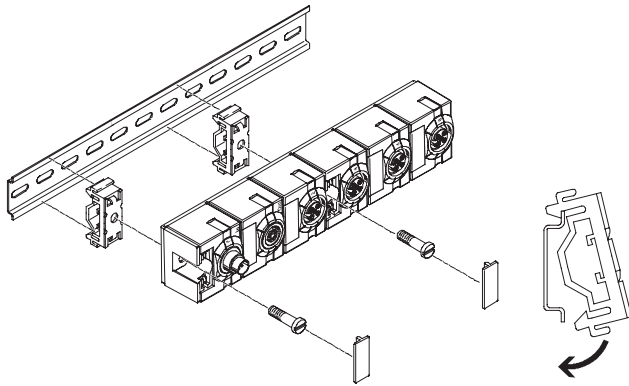
For the CP modules there is a mounting kit that can be used on an H-rail. With the compact CP modules, the mounting holes are covered by inscription labels.

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

Wall mounting

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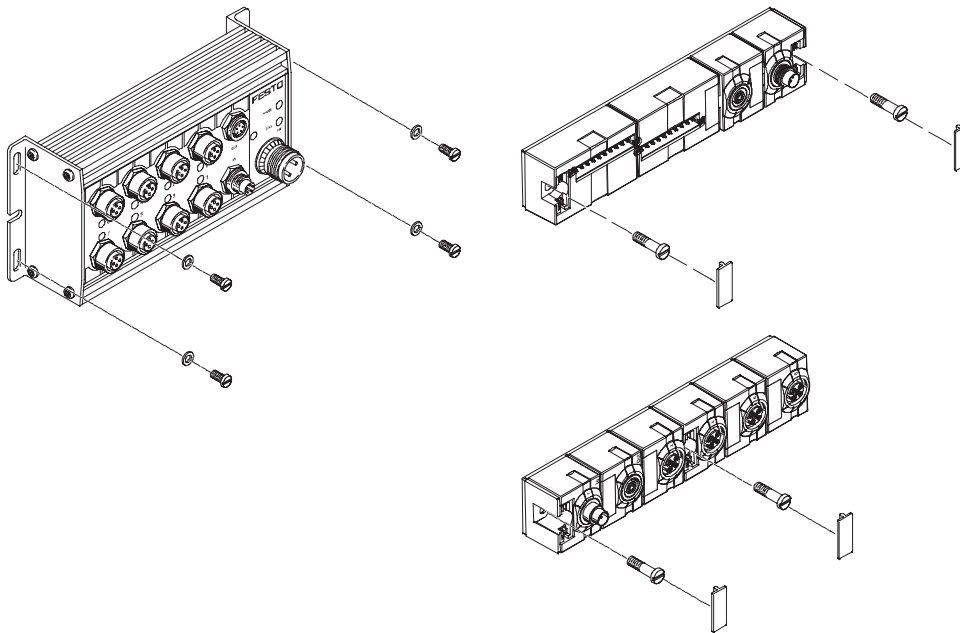
The CP modules (with screws up to 4 mm in diameter) can be mounted on even surfaces in almost any position using the mounting holes.

With the compact CP modules, the mounting holes are covered by inscription labels.

Fieldbus systems/electrical peripherals
CP installation system

4.6

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 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.
Input modules without additional power supply provide a maximum
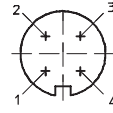
sensor supply of 500 mA or 800 mA, while input modules with additional power supply provide up to 2 A of residual current for the connected sensors.

Example of circuits for additional power supply
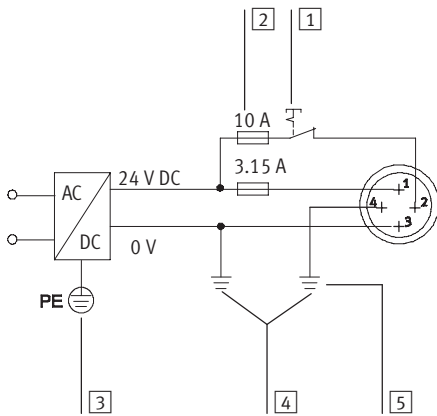
1. Load voltage supply (can be disconnected separately)
2. External fuses
3. Protective earth
4. Equipotential bonding
5. Earth connection on pin 4, rated for 12 A

Pin allocation of power supply plug

Terminal allocation	Pin	Signal	Designation
	1	24 V DC	Supply for electronics and inputs
	2	24 V DC	Load supply for valves/outputs
	3	0 V	Equipotential bonding
	4	0 V	Earth connection and equipotential bonding, rated for 12 A

Power supply concept of the CPX terminal

Circuit diagram for M18 power supply (example)

System supply

Internal wiring for power supply

$24V_{EL/SEN}$
$0V_{EL/SEN}$ — Electronics and sensors/inputs

$24V_{OUT}$
$0V_{OUT}$ — Actuators/outputs

$24V_{VAL}$
$0V_{VAL}$ — Valves

FE — Functional earth

| 7/8" | 4 | 2 | 5 | 1 | 3 |
| M18 | 1 | 3 | 2 | 3 | 4 |

Pin allocation
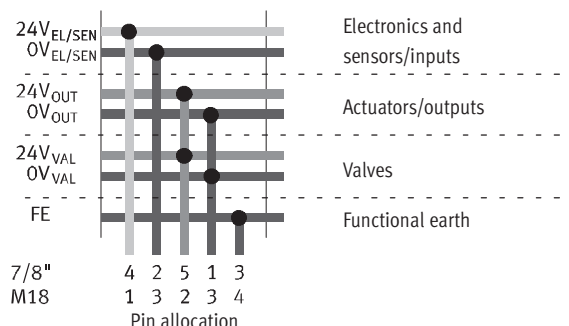
- - Note

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.

Principle

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

A distinction is made between supply for

- electronics and sensors/inputs
- valves
- actuators/outputs

Interlinking blocks

Many applications require segmenting of the voltage into zones. This is true in particular of the separate discon- nection 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 or a 5-pin 7/8" plug.

General limit values and guidelines

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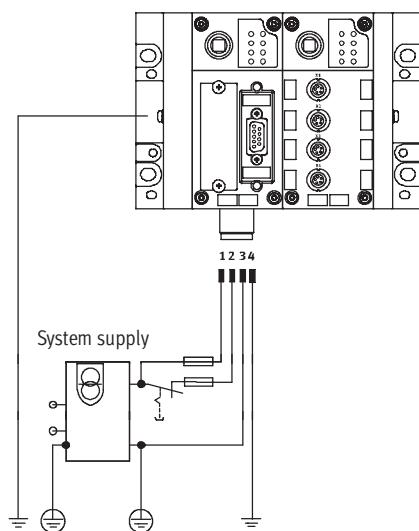
The system supply provides the internal voltage for the entire CPX system with

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

Additional power supply for valves

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

- max. 16 A for valves per additional power supply

All other voltages are fed through. The additional power supply for the valves must always be located to the right of the system supply.

CP interface

The CP interface cancels the electrical isolation between the power supply of the electronics/sensors and valves. For this reason, the power supply units at the CP interface and to its left connected to an interlinking block with system supply or additional power supply for valves must have a common negative terminal/earthing.

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

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

- max. 1.6 A per CP string

CPI installation system

Key features – Diagnosis

Diagnosis

General information	Diagnosis via LED	Diagnosis via control program/CPX-MMI

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.

- 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.

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

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

Diagnosis via CPX terminal
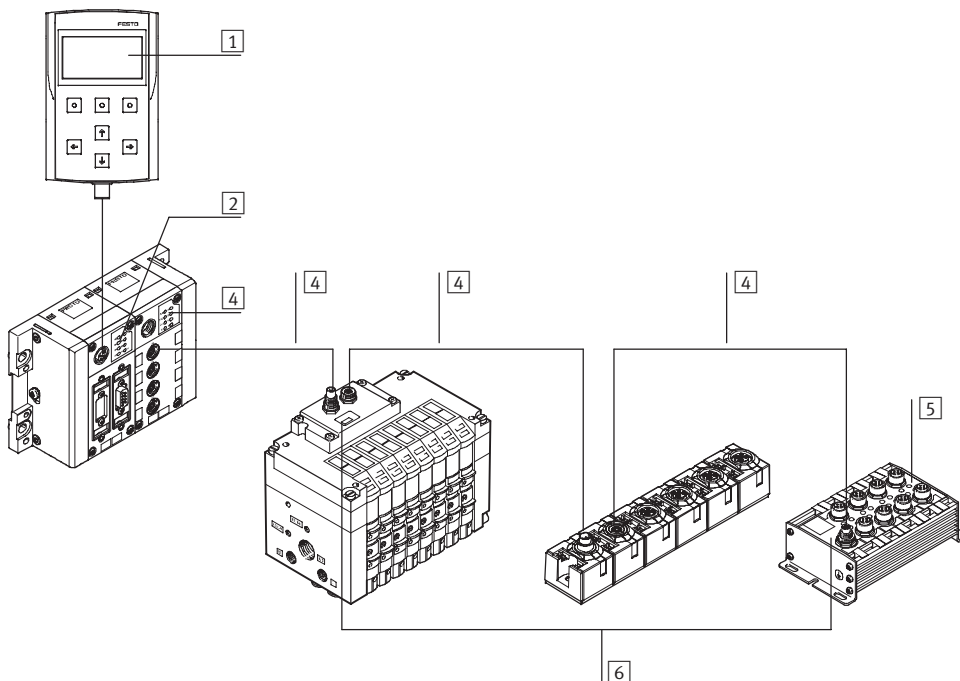
1 Diagnosis via controller/fieldbus node
2 Bus-specific LED
3 String diagnosis via LED on the CP interface
4 Diagnosis via CP string
5 Diagnosis via LED on CP module
6 Status display on CP module

Diagnosis via CP fieldbus node
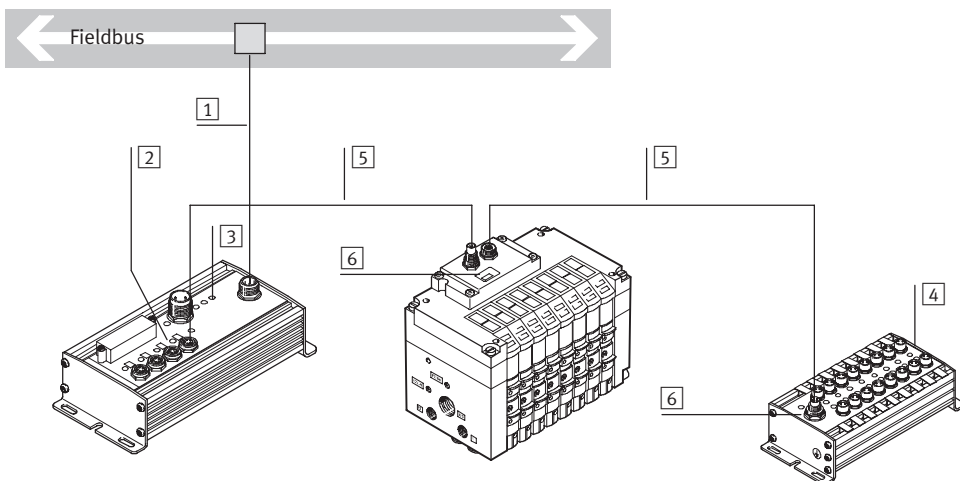
Fieldbus

1 Diagnosis via fieldbus
2 String diagnosis via LED on fieldbus node
3 Bus-specific LED
4 Diagnosis using LED on CP module
5 Diagnosis via CP string
6 Status display on CP module

CPI installation system

Key features – CP interface

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 key (after the operating voltage is switched on at the CP interface).

The configuration is always 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.

Fieldbus systems/electrical peripherals
CP installation system

4.6

CPI installation system

Selection aid

System selection aid

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

Module selection aid

	CP functionality	CPI functionality	Additional power supply	Address requirement for digital inputs	Address requirement for digital outputs	Max. acceptable current load [A]	→ Page
Input modules							
CP-E16-M8	■	–	–	16	–	0.54	4 / 4.6-39
CP-E16N-M8	■	–	–	16	–	0.59	4 / 4.6-39
CP-E16-M12x2-5POL	■	–	–	16	–	0.59	4 / 4.6-39
CP-E16N-M12x2	■	–	–	16	–	0.59	4 / 4.6-39
CP-E16-M8-Z	■	–	■	16	–	1.04	4 / 4.6-39
CP-E16-KL-IP20-Z	■	–	■	16	–	2.09	4 / 4.6-39
CP-E08-M12-CL	–	■	–	8	–	0.835	4 / 4.6-47
CP-E08-M8-CL	–	■	–	8	–	0.835	4 / 4.6-47
CP-E16-KL-CL	–	■	–	16	–	0.835	4 / 4.6-47
Output modules							
CP-A08-M12-5POL	■	–	■	–	8	2.09	4 / 4.6-53
CP-A08N-M12	■	–	■	–	8	2.09	4 / 4.6-53
CP-A04-M12-CL	–	■	–	–	4	1.035	4 / 4.6-53
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 / 2.1-87
CPA14	■	–	–	–	16	0.5	4 / 2.1-87

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 / 2.1-88 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
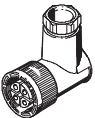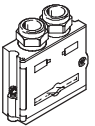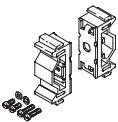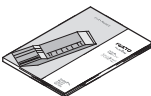
Pin allocation for fieldbus interface (plug view)						
Plug view	Pin	Festo Sub-D plug (IP65)	Manufacturer-specific signal designation			
			Festo fieldbus interface	ABB CS31	Moeller SUCONET K	
					Sub-D, 9-pin	DIN (round), 5-pin
	1					
	2					
	3	B	S+	Bus1	3 (T_A/R_A)	4 (T_A/R_A)
	4					
	5					
	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

Fieldbus systems/electrical peripherals
CP installation system

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

INTERBUS

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.

Fieldbus systems/electrical peripherals
CP installation system

4.6

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 / 2.1-88 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
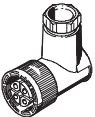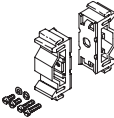
Pin allocation	Pin No.[1]	Signal	Designation
Incoming			
Plug view	1	DO	Data out
	2	/DO	Data out inverse
	3	DI	Data in
	4	/DI	Data in inverse
	5	Load	Reference conductor
	6	FE	Functional earthing for installation remote bus
	7	+24 V	Installation remote bus supply
	8	+0 V	Installation remote bus supply
	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.

Fieldbus systems/electrical peripherals
CP installation system

4.6

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.

CPI installation system

FESTO

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 / 2.1-88 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
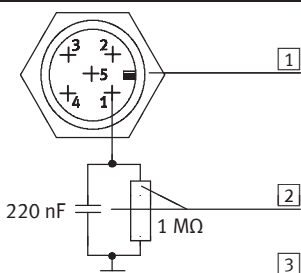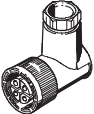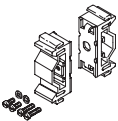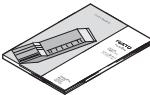
1 Plug for fieldbus cable
2 Operating voltage connection for CP and valves
3 Operating voltage LEDs
4 String LEDs
5 Save key
6 Bus status LEDs

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		

CPI installation system

FESTO

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

PROFI

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

Fieldbus systems/electrical peripherals
CP installation system

4.6

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.

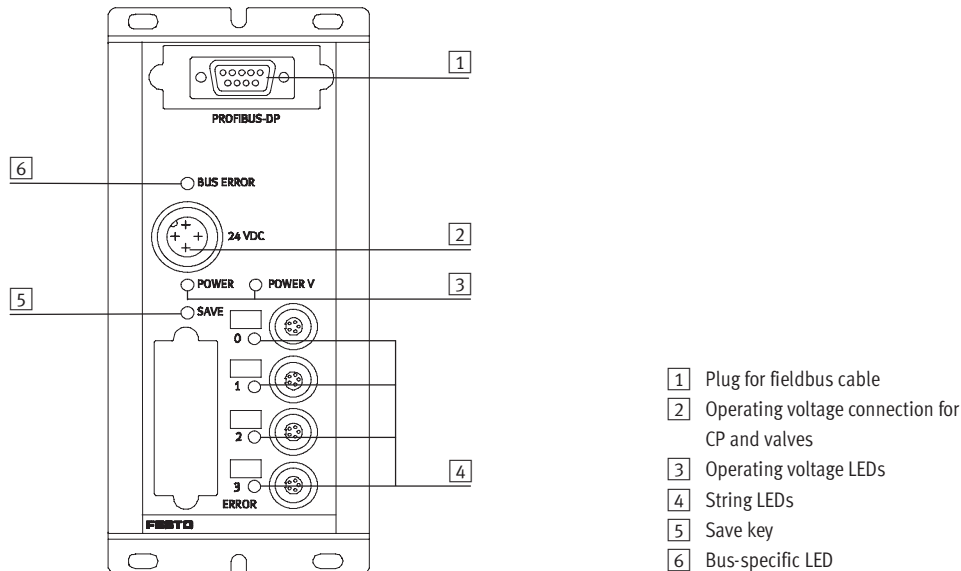# CPI installation system

Technical data – Fieldbus node CP-FB13-E

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 / 2.1-88 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

CPI installation system

Technical data – Fieldbus node CP-FB13-E
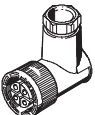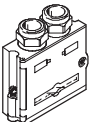
Connection and display components

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
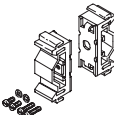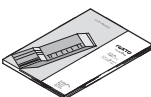
Pin allocation for Profibus DP interface			
Pin allocation	Pin	Signal	Designation
Plug, Sub-D			
	1	n.c.	Not connected
	2	n.c.	Not connected
	3	RxD/TxD-P	Received/transmitted data P
	4	CNTR-P[1]	Repeater control signal
	5	DGND	Data reference potential (M5V)
	6	VP	Supply voltage (P5V)
	7	n.c.	Not connected
	8	RxD/TxD-N	Received/transmitted data N
	9	n.c.	Not connected
	Hous-ing	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 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				
	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**

Fieldbus systems/electrical peripherals
CP installation system

4.6

CPI installation system

Technical data – Input modules CP-E16

Function

Digital input modules facilitate the connection of proximity sensors or other 24 V DC sensors (inductive, capacitive, etc.).
M12 plugs with double allocation are separated using a DUO plug or DUO cable.

Applications

- 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.
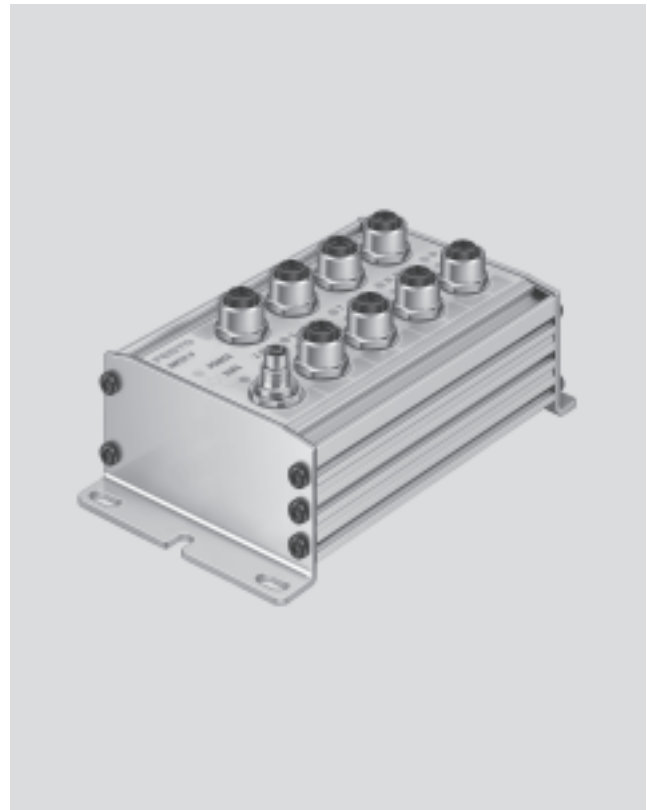
General technical data			CP-E16-M8 positive switching 18 205	CP-E16N-M8 negative switching 18 243	CP-E16-M12x2-5POL positive switching 175 561
Type					
Part No.					
No. of inputs			16		
Allocation of inputs			Single allocation		Double allocation
Sensor connection type			16x M8, 3-pin		8x M12, 5-pin
Power supply 24 V DC			Coming from bus node		
Intrinsic current consumption, 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		
Electrical 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-fabricated cables		
Protection class to EN 60529			IP65 (when fully plugged-in or fitted with protective cover)		
Temperature range	Operation	[°C]	−5 ... +50		
	Storage	[°C]	−20 ... +70		
Material			Die-cast aluminium		
Dimensions		[mm]	148.9 x 66 x 47.9		140.9 x 78 x 55.2
Weight		[g]	400		500

CPI installation system

Technical data – Input modules CP-E16

FESTO

| General technical data			CP-E16N-M12x2 negative switching	CP-E16-M8-Z positive and negative switching		CP-E16-KL-IP20-Z positive and negative switching	
Type							
Part No.			**18 244**	**189 670**		**197 983**	
No. of inputs			16			2x 8	
Allocation of inputs			Double allocation	Single allocation			
Sensor connection type			8x M12, 4-pin	16x M8, 3-pin		Screw terminal or tension-spring sockets	
Power supply 24 V DC			Coming from bus node	Coming from bus node, connection for additional sensor supply			
Intrinsic current consumption, electronics		[mA]	90	40		90	
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				
Electrical isolation			None			Yes	
Switching level				PNP	NPN	PNP	NPN
	Signal 0	[V]	≥11	≤6	≥−8.6	≤6	≥−8.6
	Signal 1	[V]	≤5	≥8.6	≤−6	≥8.6	≤−6
Input delay		[ms]	Typically 5	Typically 3			
Switching logic			NPN	PNP/NPN		PNP/NPN	
Input characteristic curve			To IEC 1131-2				
Connection to bus node			Via pre-fabricated cables				
Protection class to EN 60529			IP65 (when fully plugged-in or fitted with protective cover)				
Temperature range	Operation	[°C]	−5 ... +50				
	Storage	[°C]	−20 ... +70				
Material			Die-cast aluminium				
Dimensions		[mm]	140.9 x 78 x 55.2	216.9 x 66 x 50.6		175 x 66 x 53.2	
Weight		[g]	500	420		320	

CPI installation system

Technical data – Input modules CP-E16

Connection and display components

CP-E16-M12x2-5POL and CP-E16N-M12x2
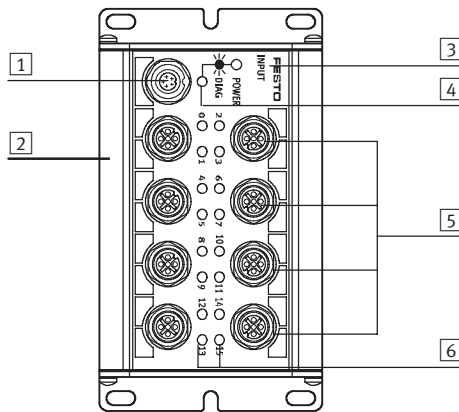
1	CP connection
2	Slot for inscription labels (ISB 6x10)
3	Identification of input type: – INPUT-P for PNP inputs – INPUT-N for NPN inputs
4	Status LED (green)
5	Sensor connections
6	Green LED for status display (one LED per input)

Pin allocation for sensor connections CP-E16-M12x2-5Pol

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

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

Pin allocation	Pin	Signal	Designation	Pin	Signal
	1	24 V	Operating voltage 24 V	1	24 V
	2	Ix+1*	Sensor signal	2	Ix+3*
	3	0 V	Operating voltage 0 V	3	0 V
	4	Ix*	Sensor signal	4	Ix+2*

* Ix = Input x

Connection and display components
CP-E16-M8-Z
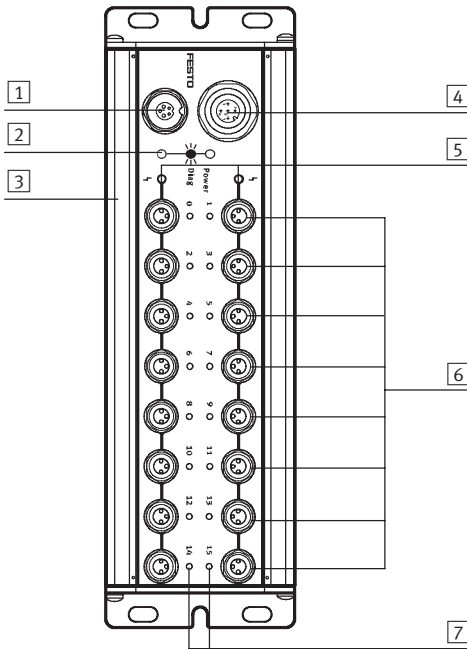
1	CP connection
2	Status LED (green)
3	Slot for inscription labels (ISB 6x10)
4	Connection for sensor supply
5	Red LED for short circuit display or sensor voltage failure (one LED per input group)
6	Sensor connections
7	Green LED for status display (one LED per input)

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

Pin allocation	Pin	Signal	Designation	
	1	24 V DC ±25%	Operating voltage	**-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.
	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	Load	Earth terminal	

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

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

*   Ix = Input x

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

*   Ix = Input x

Connection and display components

CP-E16-KL-IP20-Z

1	Connection for sensor supply
2	Sensor connections (8 inputs per input group)
3	Slot for inscription labels (ISB 6x10)
4	CP connection
5	Status LED (green)
6	Red LED for short circuit/overload display (one LED per input group)
7	Green LED for status display (one LED per input)

Pin allocation for power supply and operation mode CP-E16-KL-IP20-Z

Pin allocation	Pin	Signal	Designation	
	1	24 V DC ±25%	Operating voltage 24 V	**Note**
	2	24 V DC ±25%	Bridged with 1	
	3	PNP/NPN	Coding with negative/positive switching: – PNP operation (pin 3 and 4 bridged) – NPN operation (pin 3 and 2 bridged)	External sensor supply for CP-E16-KL-IP20-Z: Specified for PNP or NPN operation (type CP-E16-KL-IP20-Z). The input module provides PNP or NPN inputs. The setting for PNP or NPN operation is made by installing an external bridge on the sensor supply connection.
	4	0 V	Operating voltage 0 V	
	5	FE	Functional earthing	
	6	FE	Functional earthing	
	7	8*	Not in use but bridged with 8	
	8	7*	Not in use but bridged with 7	
	9	0 V	Bridged with 10	
	10	0 V		

* A separate load supply for the valves/outputs can be looped through via pin 7 and 8. The relevant potential can be passed on to the next module via the other internal bridges (24 V, FE, 0 V).

Pin allocation for sensor supply CP-E16-KL-IP20-Z

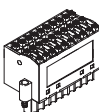| Pin allocation	Pin	Signal	Designation	Pin	Signal	
	Plug X2			Plug X3		**Note**
	+	24 V DC	Operating voltage	+	24 V DC	8 sensors can be connected to each of the connections X2 and X3. The voltage supplied externally via pin 1/2 and pin 9/10 of the plug X1 is supplied to the + and – terminals of X2 and X3 for supplying the sensors.
	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	
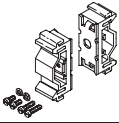
Ordering data			
Designation		Type	Part No.
Power supply			
	Plug, tension-spring socket screw-in (4 pieces)	1-row, 10-pin	PS1-SAC10-10POL	197 159
	Plug, screw terminal socket plug-in (4 pieces)	1-row, 10-pin	PS1-ZC13-10POL-SCHRAUBKL	160 800
	Power supply socket, straight, M12		FBSD-GD-9-5POL	18 324
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 OD	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
Connection sets for power supply and sensors			
	Connection set, standard tension-spring socket, screw-in, consisting of • PS1 SAC30 • PS1 SAC31	3/1-row	SEA-KL-SAC10/30	526 256
	Plug, tension-spring socket plug-in (4 pieces)	1-row, 10-pin	PS1-ZC13Z-10POL-ZUGFEDER	183 733
	Plug, screw terminal socket plug-in (4 pieces)	1-row, 10-pin	PS1-ZC13-10POL-SCHRAUBKL	160 800
	Plug, tension-spring socket screw-in	3-row, 30-pin	PS1 SAC30	197 161
	Plug, tension-spring socket screw-in, with LED	3-row, 30-pin	PS1-SAC31-30POL+LED	197 162
Sensor cable			
	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	1.0m	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

Fieldbus systems/electrical peripherals
CP installation system

4.6

Ordering data		
Designation	Type	Part No.
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**

Fieldbus systems/electrical peripherals
CP installation system

4.6

CPI installation system

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

Function

Digital input modules facilitate the connection of proximity sensors or other 24 V DC sensors (inductive, capacitive, etc.).
Plugs with double allocation are separated using a DUO plug or DUO cable.

Applications

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

General technical data			CP-E08-M12-CL positive switching	CP-E08-M8-CL positive switching	CP-E16-KL-CL positive switching
Type					
Part No.			**538 787**	**538 788**	**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, 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		
Electrical 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			Using pre-assembled cables		
Diagnosis			Undervoltage		
			Short circuit/overload, sensor supply		

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

Operating conditions			CP-E08-M12-CL	CP-E08-M8-CL	CP-E16-KL-CL
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 cover)		IP20
Temperature range	Operation	[°C]	−5 … +50		
	Storage	[°C]	−20 … +70		
Corrosion resistance class CRC[1]			1		
CE symbol (declaration of conformity)			In accordance with EU EMC directive		
Certification			c UL us - Listed (OL)		

1) Corrosion resistance class 1 according 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
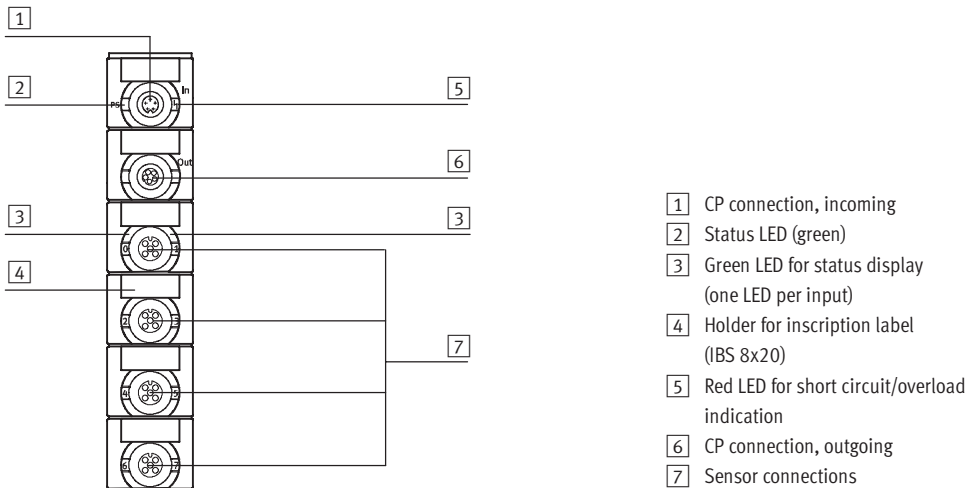
Connection and display components

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	Designation
	1	24 V	Operating voltage 24 V
	2	Ix+1*	Sensor signal
	3	0 V	Operating voltage 0 V
	4	Ix*	Sensor signal
	5	Load	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 (ISB 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	Designation	Pin	Signal
	1	24 V	Operating voltage 24 V	1	24 V
	3	0 V	Operating voltage 0 V	3	0 V
	4	Ix*	Sensor signal	4	Ix+1*

*　Ix = Input x

CPI installation system

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

Connection and display components

CP-E16-KL-CL
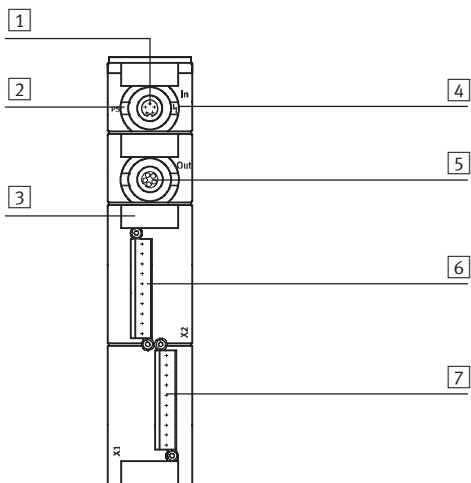
1 CP connection, incoming
2 Status LED (green)
3 Holder for inscription label
  (ISB 8x20)
4 Red LED for short circuit/overload
  indication
5 CP connection, outgoing
6 Sensor connections, plug X2
7 Sensor connections, plug X1

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

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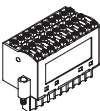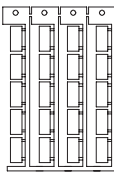
Plug connection for power supply for sensors (PS1-SAC31-30POL+LED)

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

CPI installation system

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 OD	**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**
Connection sets for sensors				
	Plug, tension-spring socket screw-in, 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**

Fieldbus systems/electrical peripherals
CP installation system

4.6

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			CP-A08-M12-5POL positive switching	CP-A08N-M12 negative switching
Type				
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	

CPI installation system

Technical data – Output modules CP-A08

Connection and display components

CP-A08-M12…
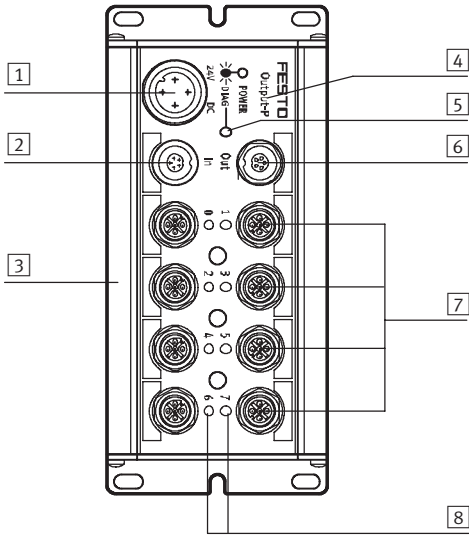
1	Load voltage connection
2	CP connection, incoming
3	Slot for inscription labels (ISB 6x10)
4	Identifier for output type: – OUTPUT-P for PNP outputs – OUTPUT-N for NPN outputs
5	Status LED (green)
6	CP connection, outgoing
7	Connections for actuators
8	Yellow LED for status display (one LED per output)
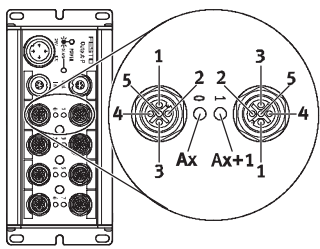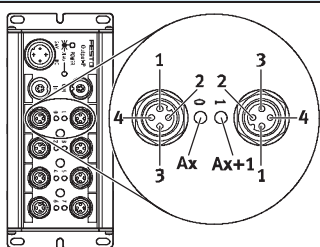
Pin allocation for load voltage connection CP-A08-M12…

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

4.6

CPI installation system

Technical data – Output modules CP-A08
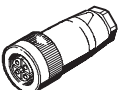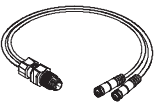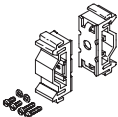
Pin allocation for outputs						
Terminal allocation	Pin	Signal	Designation	Pin	Signal	
CP-A08-M12-5POL (PNP outputs)						
	1	n.c.	Not connected	1	n.c.	**Note**
	2	Ox+1	Connected with pin 4 of plug 2/ not connected	2	n.c.	Two outputs can be connected to output sockets 0, 2, 4 and 6 of the CP output module by means of internal connection between pin 2 of the even numbered output and pin 4 of the opposite odd numbered output.
	3	0 V	Reference potential	3	0 V	
	4	Ox	Output/connected with pin 2 of plug 1	4	Ox+1	
	5	Load	Earth terminal	5	Load	
CP-A08-M12 (NPN outputs)						
	1	24 V DC	Operating voltage	1	24 V DC	**Note**
	2	FE (earth)	Earth terminal	2	FE (earth)	The consuming devices/load must be supplied with a 24 V operating voltage via pin 1.
	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-A04

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 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		Sockets 1 and 3 with double allocation, sockets 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, electronics	[mA]	Typically 35
Max. output current per channel	[A]	Max. 0.5, max. 2 outputs, parallel connection possible
Operating voltage	[V]	24 DC ±25%
Fuse protection for power output		Internal electronic short-circuit protection per output
Switching logic		PNP
Output characteristic curve		Per ICE 1131-2
Electrical isolation		None
Connection to bus node		Using pre-assembled cables
Diagnosis		Undervoltage
		Short circuit at actuator output (per channel)
Protection class to EN 60529		IP65/IP67 (when fully plugged-in or fitted with protective cover)
Temperature range	Operation [°C]	−5 … +50
	Storage [°C]	−20 … +70
Material		Polybutylene terephthalate
Dimensions (L x W x D)	[mm]	151 x 30 x 25
Weight	[g]	165

Fieldbus systems/electrical peripherals
CP installation system

4.6
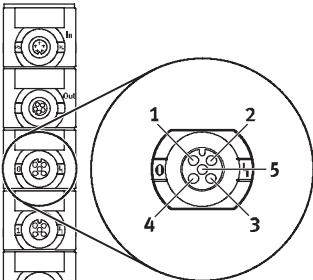
Operating conditions			
Type			**CP-A04-M12-CL**
Protection class to EN 60529			IP65/IP67 (when fully plugged-in or fitted with protective cover)
Temperature range	Operation	[°C]	−5 ... +50
	Storage	[°C]	−20 ... +70
Corrosion resistance class CRC[1]			1
CE symbol (declaration of conformity)			In accordance with EU EMC directive
Certification			c UL us - Listed (OL)

1) Corrosion resistance class 1 according 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
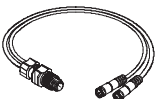
Connection and display components

CP-A04-M12-CL

1 CP connection, incoming
2 Status LED (green)
3 Holder for inscription label
   (ISB 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)
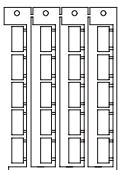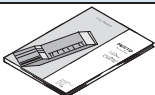
Pin allocation for outputs						
Terminal allocation	Output 1 and 3		Designation	Output 2 and 4		
	Pin	Signal		Pin	Signal	
CP-A08-M12-5POL (PNP outputs)						
	1	n.c.	Not connected	1	n.c.	⌇ Note
	2	Ox+1	Connected with pin 4 of plug 2/ not connected	2	n.c.	Two outputs can be connected to output sockets 1 and 3 of the CP output module by means of internal connection between pin 2 of the odd numbered output and pin 4 of the underlying even numbered output.
	3	0 V	Reference potential	3	0 V	
	4	Ox	Output/connected with pin 2 of plug 1	4	Ox+1	
	5	FE (earth)	Earth terminal	5	FE (earth)	

*   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 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**
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**

Fieldbus systems/electrical peripherals
CP installation system

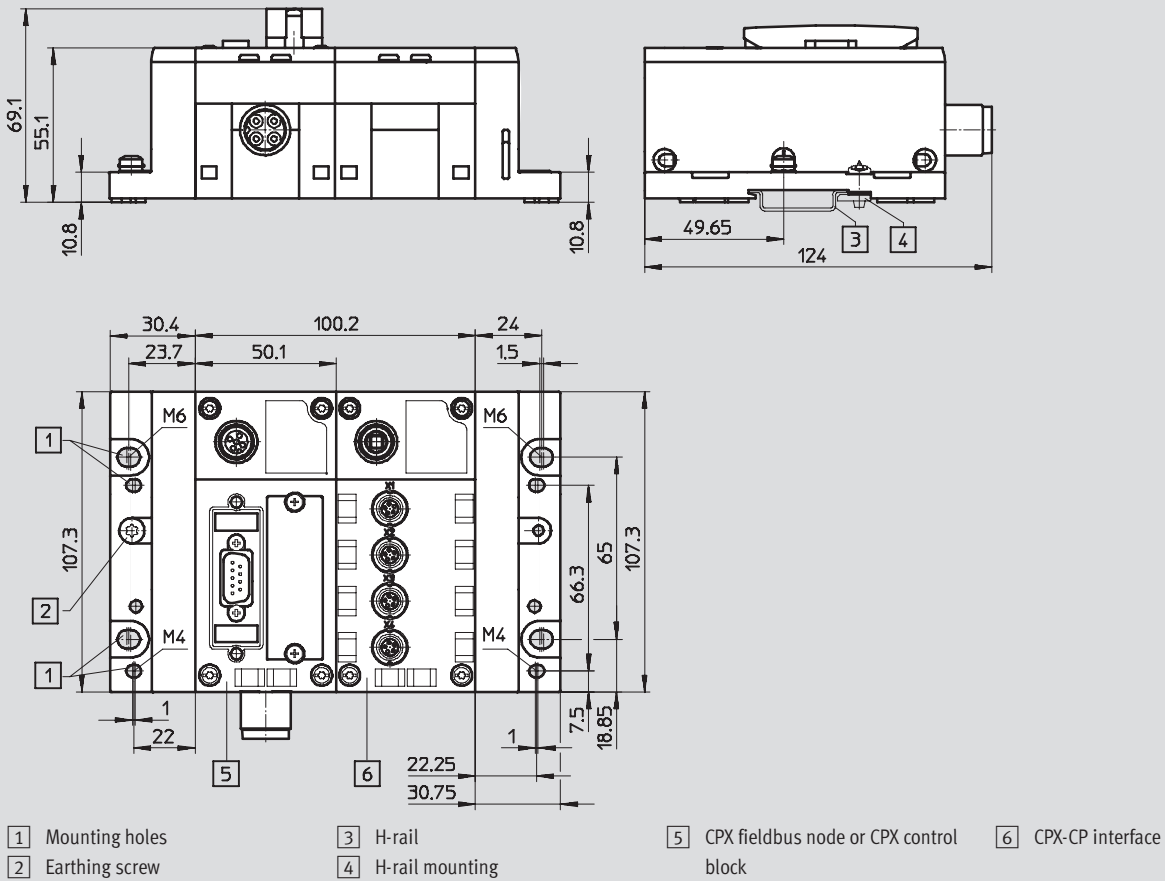**4.6**

CPI installation system

Technical data

Dimensions – Fieldbus node/control block

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

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

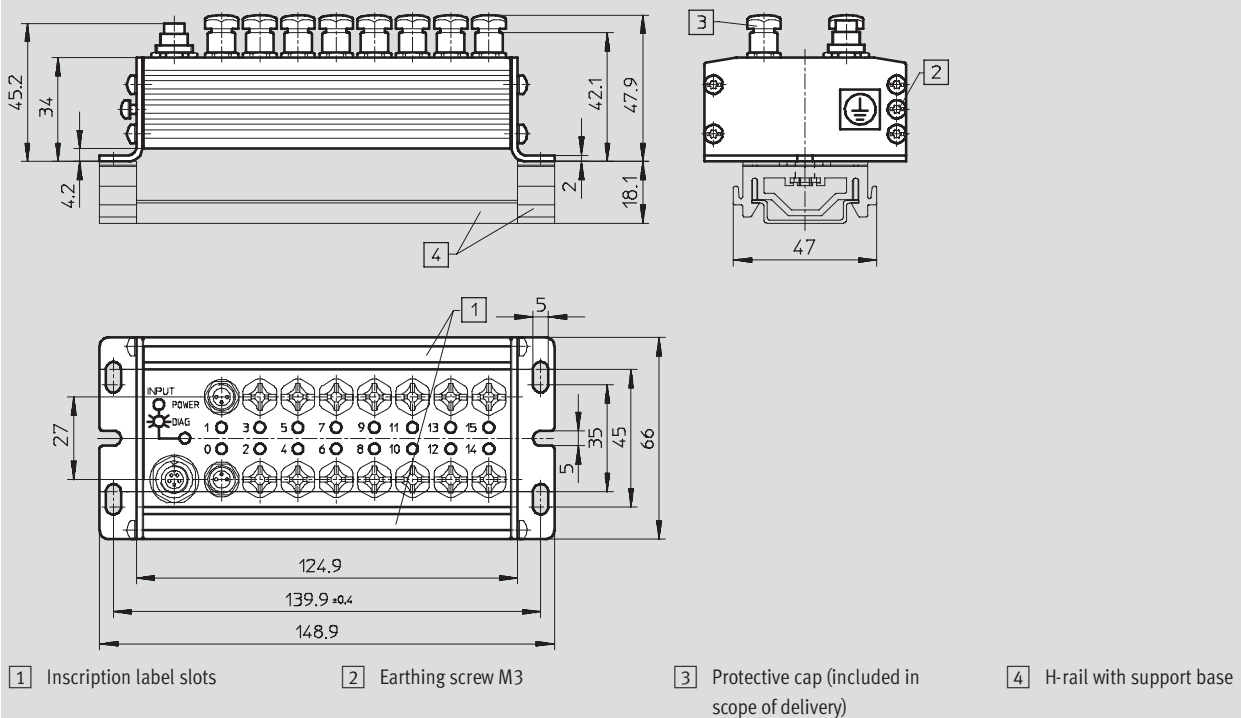|				
1	Mounting holes	3	H-rail	5	CPX fieldbus node or CPX control block
2	Earthing screw	4	H-rail mounting	6	CPX-CP interface

CPI installation system

Technical data

CP-E16-M8

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

CP-E16-M8-Z

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

CPI installation system

Technical data

Dimensions – 16-fold input modules	Download CAD data → **www.festo.com/en/engineering**

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

☐1	Inscription label slots	☐2	Earthing screw M3	☐3	Protective cap (included in scope of delivery)	☐4	H-rail with support base

CP-E16-KL-IP20-Z

☐1	Inscription label slots	☐2	Earthing screw M3	☐3	Protective cap (included in scope of delivery)	☐4	H-rail with support base
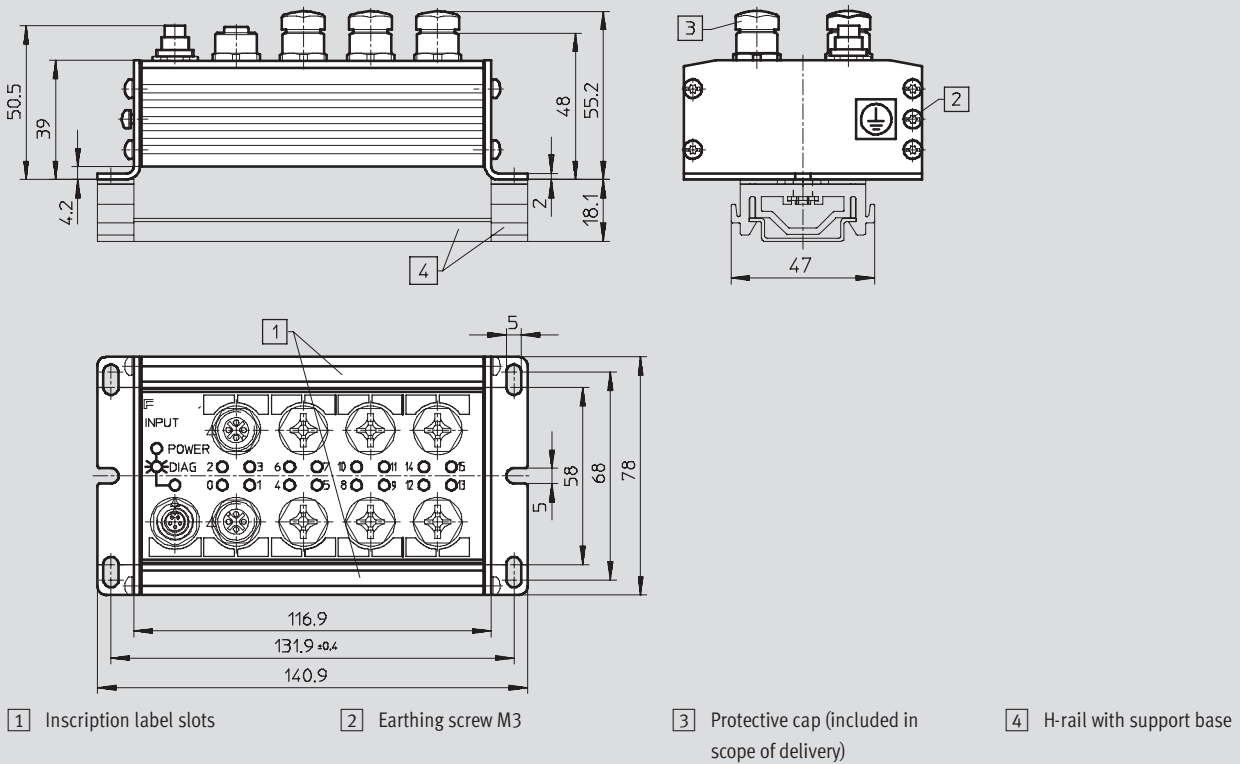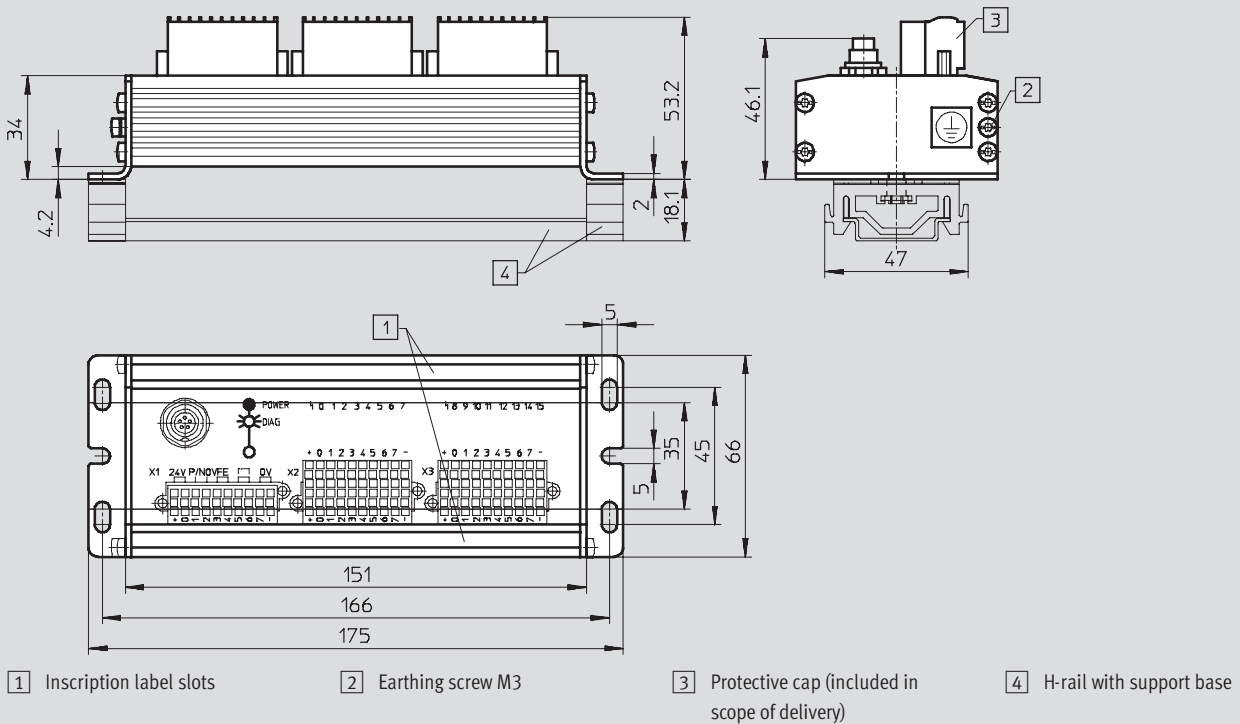
CPI installation system

Technical data

Dimensions – 8-fold output modules　　　　　　　　Download CAD data ➔ **www.festo.com/en/engineering**

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

☐	Description
1	Inscription label slots
2	Earthing screw M3
3	Protective cap (included in scope of delivery)
4	H-rail with support base
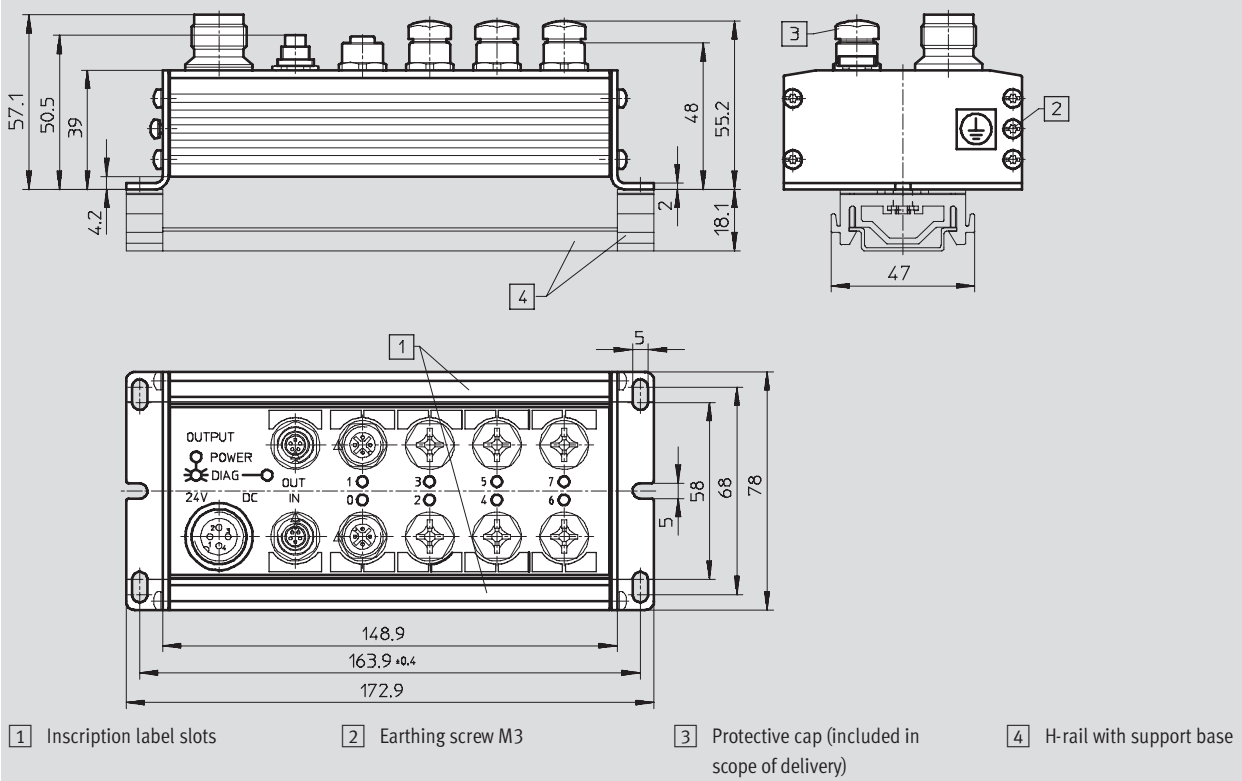
CPI installation system

Technical data

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

CP-E08-M12-CL/CP-A04-M12-CL
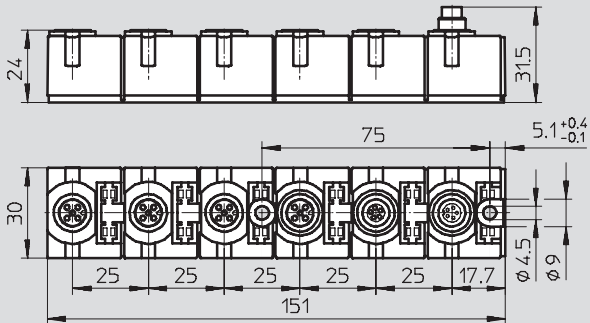
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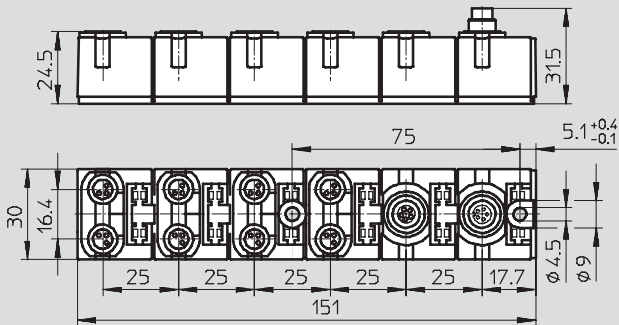
CP-E16-KL-CL
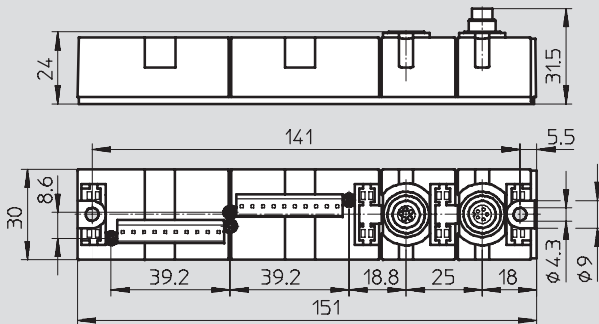
CPI installation system

Order processing information

Configuration guidelines

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

master and the CP modules connected.

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

– with CPI functionality
– without CPI functionality

CP modules with CPI functionality

CP modules with CPI functionality offer the following features:
– Incoming and outgoing CP interface
– Any arrangement of the modules within a CP string

– Max. 4 modules per CP string
– Max. 32 inputs and 32 outputs can be connected to each string depending on the version (previous version 16I/16O)

CP modules without CPI functionality

CP modules from the previous generation offer the following features:
– CP valve terminals and CP output modules have an incoming and outgoing CP interface
– CP input modules have an incoming

CP interface only 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 CPU 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 / 4.6-71

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 initiating an order for the electrical installation system CPI:
– 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 CP installation system
➔ 4 / 4.6-66

The CPV and CPA valve terminals are configured separately:
– CPV valve terminals for operation within the CPI installation system, CPV10/14/18-VI-FB-….
➔ Info 213
➔ 4 / 2.1-58
– CPA valve terminals for operation within the CPI installation system, CPA10/14-IFB-CP….
➔ Info 214
➔ 4 / 2.1-118

CPI installation system

Ordering data – Modular products

FESTO

M	Mandatory data			O	Options	→

Module No.	CP electrical components	Fieldbus node/control block	Fieldbus connection socket/plug	Supply
539 641	CTEC	CPX, C06, C11, C13, C14, C23, CT3	GA, GB, GC, GD, GE, GF, GI, GL, GM, GP, GH	S, QP
Ordering example				
539 641	**CTEC**	**– C06**	**GI**	**S**
1	2	3	4	5

Ordering table			Condi-tions	Code	Enter code
M 1	Module No.	539 641			
2	CP electrical components	CP installation system		**CTEC**	CTEC
3	Fieldbus node or control block	Position holder for CPX terminal, CP interface		**-CPX**	
		Fieldbus node for Interbus + CP interface	1 2	**-C06**	
		Fieldbus node for DeviceNet + CP interface	2	**-C11**	
		Fieldbus node for Profibus DP + CP interface	2	**-C13**	
		Fieldbus node for CANopen + CP interface	2	**-C14**	
		Fieldbus node for CC-Link + CP interface	2	**-C23**	
		Front End Controller (FEC Remote Control or IO) + CP interface	2	**-CT3**	
O 4	Fieldbus connection socket/plug	Fieldbus connection, 2xM12, 5-pin, DNet/CAN	3	**GA**	
		Connection set, 5-pin clamp, for DNet/CAN	3	**GB**	
		Without node-specific connection technology		**GC**	
		Fieldbus plug IP65 for DNet/CAN	3	**GD**	
		Sub-D fieldbus plug for Profibus-DP	4	**GE**	
		Fieldbus connection 2xM12, 5-pin RK, for Profibus DP	4	**GF**	
		Connection set, 9-pin, Sub-D Interbus	5	**GI**	
		Fieldbus connection screw terminal for CC	6	**GL**	
		Fieldbus connection IP65, 9-pin, Sub-D for CC-Link	6	**GM**	
		Connection block 2xM12 for Interbus	5	**GP**	
		Connection set, IP65, RJ45 for Ethernet	7	**GH**	
5	Supply	Interlinking block with system supply	8	**S**	
		Interlinking block with system supply, 7/8", 5-pin	8	**QP**	

1 **C06** Observe maximum number of inputs/outputs (96/96).
2 **C06, C11, C13, C14, C23, CT3** Only with supply S.
3 **GA, GB, GD** Only with module C11, C14.
4 **GE, GF** Only with module C13.

5 **GI, GP** Only with module C06.
6 **GL, GM** Only with module C23.
7 **GH** Only with module CT3.
8 **S, QP** Not in combination with CPX.

Transfer order code

539 641	CTEC	–			
1	2	3		4	5

CPI installation system

Ordering data – Modular products

[M] Mandatory data	**[O] Options**		→

String 1	String 2	String 3	String 4

6 Connecting cable: Q, R, S, K, L, U, V, W
7 Module: E, M, GE, F, GF, GN, A, GA, P

–	**S GA R GF K M**	–	**K F**	–	**Q GE S GF V P U GN**	–	

6 + 7

Ordering table				
Module No.	539 641	Conditions	Code	Enter code
↓	String 1 … 4		⑨	-	-
[M] 6	Connecting cable 1 … 4 per string	Connecting cable WS-WD, 0.25 m	⑩	Q	Enter equipment selection for module positions in 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, 16xM8, PNP	⑪ ⑫	E	
		Sturdy 16-fold input module, 16xM8, Z	⑪ ⑫	M	
		Compact 8-fold input module, 8xM8, PNP, 3-pin	⑪	GE	
		Sturdy 16-fold input module, 8xM12, PNP, 5-pin	⑪ ⑫	F	
		Compact 8-fold input module, 4xM12, 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, 4xM12, PNP, 5-pin	⑪	GA	
↓		Place holder for valve terminal CPV/CPA	⑪	P	

⑨ **String 1 … 4** The strings must be continuously allocated; minimum string 1.
The following applies to each string:
Max. 4 positions can be equipped.
Max. 32 inputs and max. 32 outputs.
Critical equipment: 1x E, M, F; 4x GE, GF, GN; 1x A, P; 3x GA.

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

⑪ **E, M, GE, F, GF, GN, A, GA, P**
A connecting cable must always be selected for a module.

⑫ **E, M, F** Subsequent module no longer permitted.

Transfer order code

–		–		–		–	

6 + 7

CPI installation system

Ordering data – Modular products

→ ⓪ **Options**

User documentation	Sensor plug	Cable socket	DUO plug	H-rail mounting set	H-rail mounting	Connection set CP-E16-KL-CL	Mains connection
D, E, F, S, I, V	...S, ...W, ...P, ...R, ...C	...D	...X, ...K	...H	...U	...L	M, N, I, J
– **E**	+ **5S**	**2D**	**X**	**3H**		**3L**	**M**
8	**9**						

Ordering table						
Module No.		539 641		Conditions	Code	Enter code
↓ ⓪ **8**	User documentation	German			**-D**	
		English			**-E**	
		French			**-F**	
		Spanish			**-S**	
		Italian			**-I**	
		Swedish			**-V**	
9	Accessories				**+**	+
	Sensor plug	straight, M12, Pg7	1 ... 99	13	**...S**	
		4-pin, M12, for 2.5 mm cable diameter	1 ... 99	13	**...W**	
		M12, 5-pin, Pg7	1 ... 99	13	**...P**	
		straight, M8, solderable	1 ... 99	14	**...R**	
		straight, M8, screw-in	1 ... 99	14	**...C**	
	Cable socket	straight, 5-pin, Pg9	1 ... 99	15	**...D**	
	DUO plug	M12 (2 cable lengths)	1 ... 99	16	**...X**	
		5-pin	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, 1.5 mm^2	1	18	**N**	
		straight, 2.5 mm^2	1	18	**M**	
		angled, 1.5 mm^2	1	18	**I**	
		angled, 2.5 mm^2	1	18	**J**	

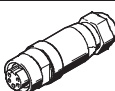|		
13 **S, W, P**	Only with module F, A, GF, GA.	
14 **R, C**	Only with module E, M, GE.	
15 **D**	Only with module M.	
16 **X, K**	Only with module F, A, GF, GA.	
17 **H**	Only with module E, M, F, A.	
18 **U, N, M, I, J**	Only with module C06, C11, C13, C14, C23, CT3.	
19 **L**	Only with module GN.	

Fieldbus systems/electrical peripherals
CP installation system

4.6
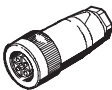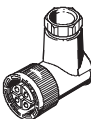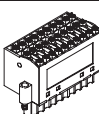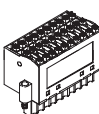
Transfer order code

– [_____] + [_____] [_____] [_____] [_____] [_____] [_____] [_____]
8   **9**

CPI installation system

Accessories
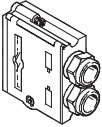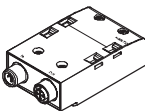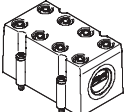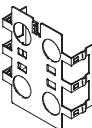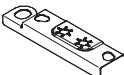
Ordering data				
Designation			Type	Part No.
Plug connectors – Power supply				
	Power supply socket, straight	for 1.5 mm^2	NTSD-GD-9	18 493
		for 2.5 mm^2	NTSD-GD-13,5	18 526
	Power supply socket, angled	for 1.5 mm^2	NTSD-WD-9	18 527
		for 2.5 mm^2	NTSD-WD-11	533 119
	Plug, tension-spring socket, screw-in (4 pieces)	1-row, 10-pin	PS1-SAC10-10POL	197 159
	Power supply socket for CPX system supply	7/8" connection	NECU-G78G5-C2	543 107
Connection sets for power supply and sensors				
	Connection set, standard tension-spring socket, screw-in, consisting of • PS1 SAC30 • PS1 SAC31	3/1-row	SEA-KL-SAC10/30	526 256
	Plug, tension-spring socket, plug-in (4 pieces)	1-row, 10-pin	PS1-ZC13Z-10POL-ZUGFEDER	183 733
	Plug, screw terminal socket, plug-in (4 pieces)	1-row, 10-pin	PS1-ZC13-10POL-SCHRAUBKL	160 800
	Plug, tension-spring socket, screw-in	3-row, 30-pin	PS1 SAC30	197 161
	Plug, tension-spring socket, screw-in, 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 mm^2 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

CPI installation system

Accessories
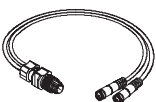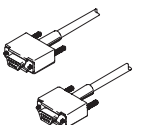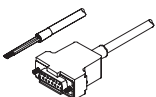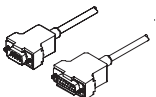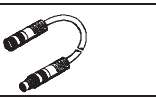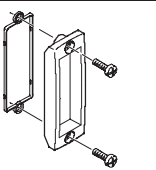
Ordering data				
Designation			Type	Part No.
Plug connectors – Fieldbus connection				
	Sub-D plug for INTERBUS	Incoming	**FBS-SUB-9-BU-IB-B**	**532 218**
		Outgoing	**FBS-SUB-9-GS-IB-B**	**532 217**
	Sub-D plug for DeviceNet/CANopen		**FBS-SUB-9-BU-2x5POL-B**	**532 219**
	Sub-D plug for Profibus DP		**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 plug (B-coded) for Profibus DP		**FBA-2-M12-5POL-RK**	**533 118**
	Bus connection Micro Style 2xM12 for DeviceNet/CANopen		**FBA-2-M12-5POL**	**525 632**
	Socket M12 for Micro Style connection		**FBSD-GD-9-5POL**	**18 324**
	Plug M12 for Micro Style connection		**FBS-M12-5GS-PG9**	**175 380**
	Connection block M12 adapter (B-coded) for Profibus DP		**CPX-AB-2-M12-RK-DP**	**541 519**
	Connection block M12 adapter plug (B-coded) for INTERBUS		**CPX-AB-2-M12-RK-IB**	**534 505**
	Bus connection Open Style for 5-pin terminal strip for DeviceNet/CANopen		**FBA-1-SL-5POL**	**525 634**
	Bus connection 5-pin terminal strip for DeviceNet/CANopen		**FBSD-KL-2x5POL**	**525 635**
	Bus connection screw terminal for CC-Link		**FBA-1-KL-5POL**	**197 962**
	RJ45/plug		**FBS-RJ45-8-GS**	**534 494**
Accessories – Fieldbus connection				
	Threaded sleeve, 4 pieces		**UNC4-40/M3x6**	**533 000**
	Cover for CPX-AB-8-KL-4POL (IP65/67) – 8 cable feeds M9 – 1 cable 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**
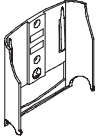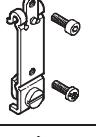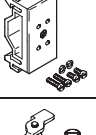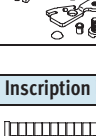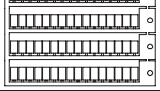
Ordering data			
Designation		Type	Part No.
Connecting cables			
DUO cable M12-2xM8, 4-pin/2x3-pin	2x straight socket	**KM12-DUO-M8-GDGD**	**18 685**
	2x straight/angled socket	**KM12-DUO-M8-GDWD**	**18 688**
	2x angled socket	**KM12-DUO-M8-WDWD**	**18 687**
Connecting cable, M8-M8, straight plug-straight 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**
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**
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**

Fieldbus systems/electrical peripherals
CP installation system

4.6

Ordering data

Designation		Type	Part No.
Mounting components			
	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**

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**

Ordering data – Documentation				
Designation			Type	Part No.
	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 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**
	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**
	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**
	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**

Fieldbus systems/electrical peripherals
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