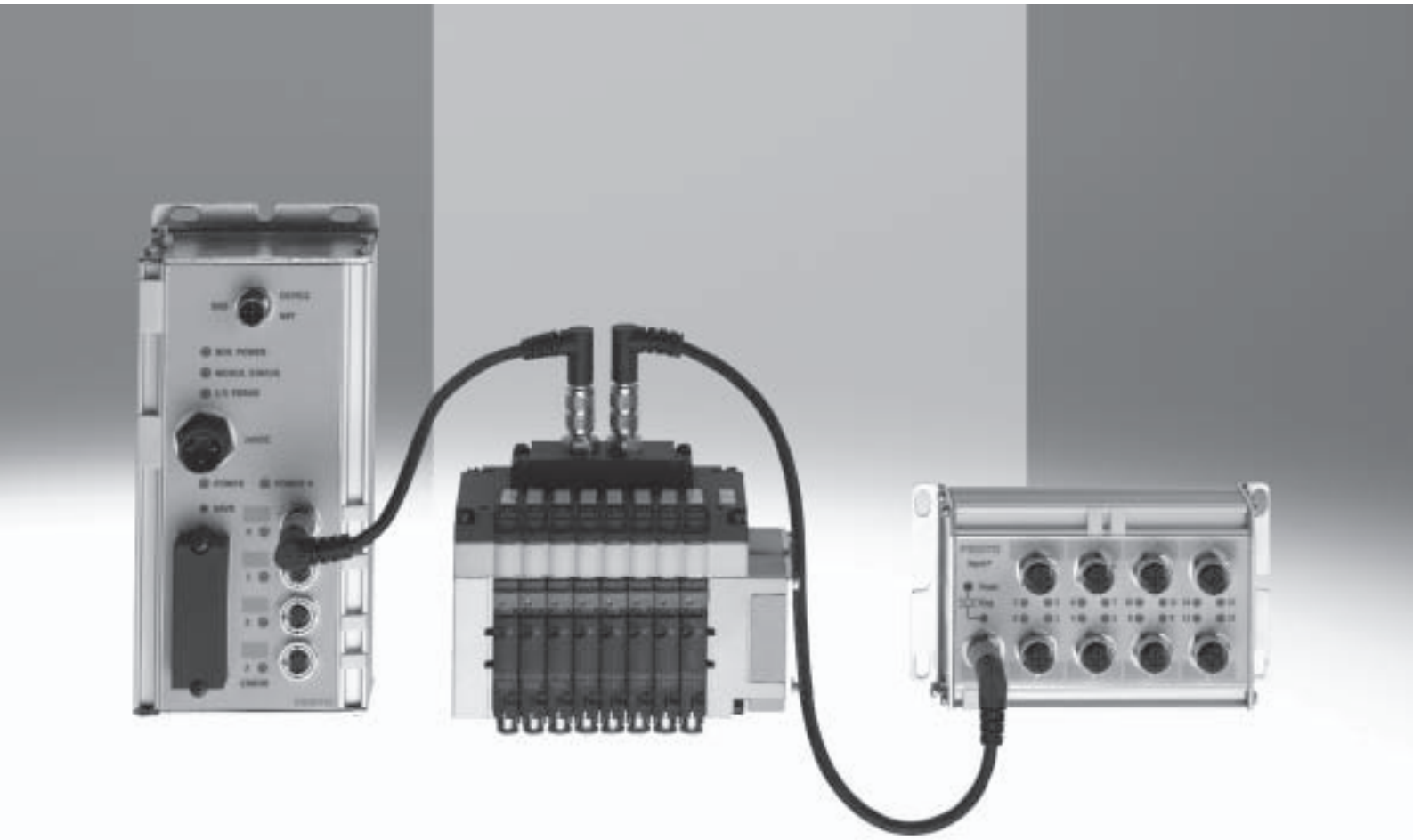
CP installation system

Installation-saving thanks to Festo plug and work®

FESTO

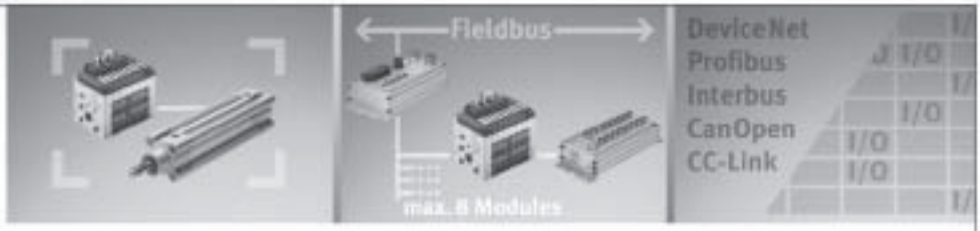


A central bus connection
for a decentralised system

Info 221

Maximum cycle rates with minimum installation effort

CP installation system
If maximum cycle rates are required and installation work is to be limited to just a few wires, there is only one option: the CP installation system. This provides the best possible proximity of valve terminals to drives, because the fieldbus nodes of the CP system are in direct dialogue with the valve terminals and the electrical input and output modules. Decentralised assembly with central electrical installation.



Decentralised installation, centralised networking, for large I/O units.

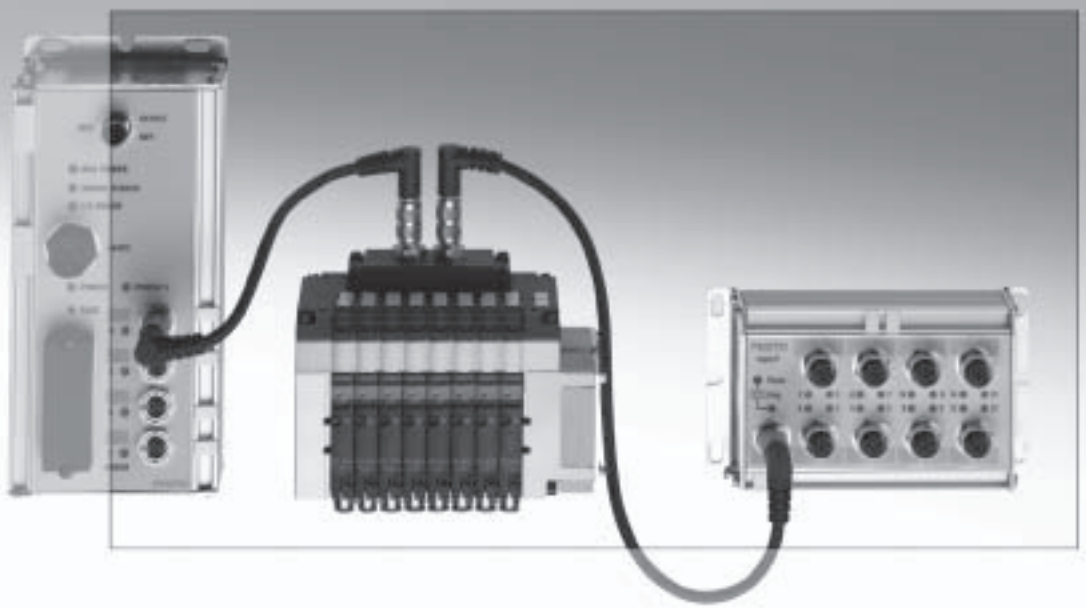
Integration guaranteed
Festo valve terminals are the first choice in a wide variety of fieldbus systems and corresponding, subordinate networking concepts. They are available in centralised and modular, decentralised and compact versions. A wide selection of installation variants, specialised solutions and an extensive range of electrical accessories, including cables and connectors, guarantee maximum flexibility.

Convincing concept
The low weight of the compact valve terminals means that they can be installed right where they are needed. This direct proximity to the actuator drastically reduces switching times. The perfect balance between size and flow rate rounds off the concept.

Versatile diagnostics and maintenance
The CP installation system supports a wide range of diagnostics options.

New: the compact CP I/O modules (CL)
Ideal for handling and assembly, or for the electronics and light assembly industries. The smaller dimensions allow installation directly next to the sensors and actuators. Depending on place of use, in IP65/IP67 or, as spring-loaded terminal modules, more at home in the control cabinet.

New: the expanded CP options
Information on the new "CPI installation system" can be found in the brochure of the same name (Info 243), which is available in the Download Area on www.festo.com.



- Connection of the most commonly used fieldbus protocols
- Decentralised assembly with simple electrical installation
- Access to proven basic products

The CP installation system: one platform for a number of tasks with an even greater number of advantages.

Advantages for designers

- Easy integration in existing control systems
- Easy to switch between a number of fieldbus protocols
- Up to 8 modules (valve terminals, CP input/output modules with only one fieldbus node and power supply
- Installed right where it's needed, reduced installation space thanks to maximum performance in the smallest space
- Flexible adaptation to the automation application
- Installation-saving solutions save time

Advantages for purchasers

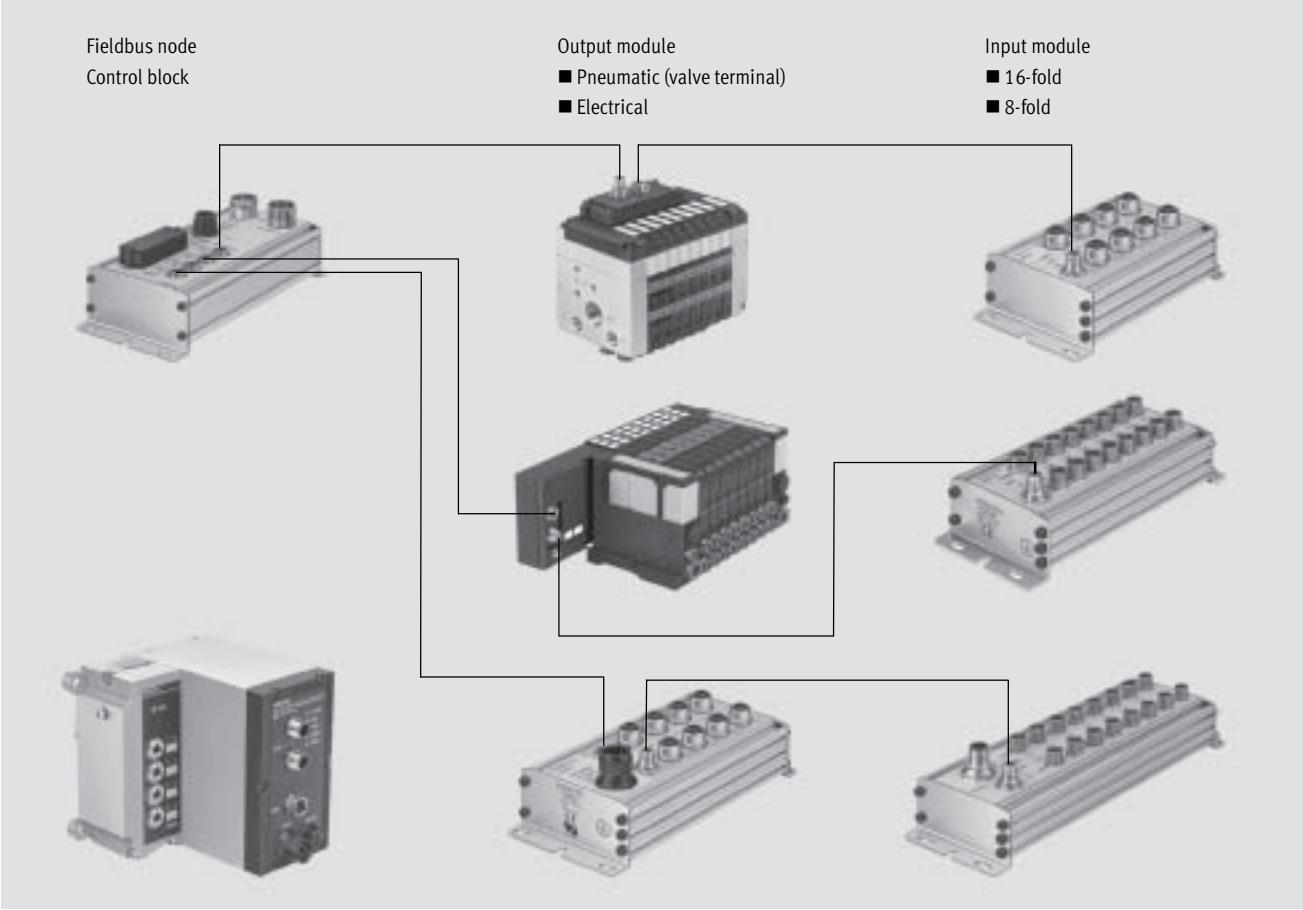
- Reduced costs thanks to single sourcing, optimised product selection and warehousing
- Reliable ordering thanks to the Festo product configurator with plausibility check
- Reduced costs thanks to installation with ready-to-connect cables and plug and work
- Pneumatically innovative and proven technology reduces follow-up costs
- Fully pre-assembled and tested units
- Low operating costs and reduced costs thanks to smaller range of parts

Advantages for commissioning and maintenance

- Simple expansion and fast and reliable switching of modules
- High machine availability
- Simple, step-by-step installation and commissioning
- Competent support and comprehensive product documentation
- Integrated diagnostics concept reduces system downtimes

CP installation system

Key features



Proven

- Complete concept for decentralised machine and system structure
- 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

Sturdy

- Fieldbus node in metal housing
- Electrical accessories to IP65
- Proven valve terminals CPV (compact) and CPA (modular sub-bases)
- Electrical input and output modules in metal and plastic housing
- Sturdy connection technology M12, alternatively M8

Versatile

- Four CP strings up to 10 m permit optimum decentralisation
- 16 inputs and 16 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 or 16 inputs with or without auxiliary power supply
- Universal electrial outputs 4-fold or 8-fold
- IP20 module with 16 inputs for control cabinet installation

Reliable

- Sturdy modules and accessories
- Ready to install system including CP cables
- 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 fieldbus
- Intelligent system (teach-in button) ”learns” current configuration
- Easy replacement of modules at any time

CP installation system

Key features

CP installation system

The CP 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 CP 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.

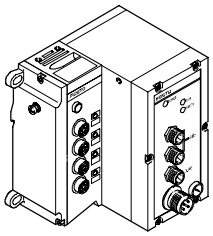
All CP valve terminals and CP modules are connected using a ready to install CP cable, and are attached to the CP fieldbus node. One CP valve terminal and one CP input module make up an installation string that ends at the CP fieldbus node. The installation system supports a maximum of 4 installation strings, which can be connected to the fieldbus node. Each string can be extended up to a maximum length of 10 metres.

The CP fieldbus node is the central connection point for the fieldbus and for the valve actuation and sensor power supply. It is here that the relevant bus parameters are set by means of switches and the standard fieldbus connector is attached. The power supply for the sensors connected to the input modules is separate from the load voltage of the valves. The CP string is used to exchange the input and output states of the connected modules with the CP fieldbus node and supply power separately to the valves and input module.

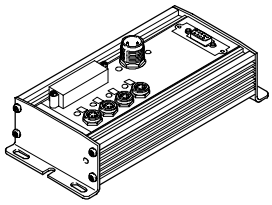
The CP valve terminals and CP input modules do not need any other electrical connection apart from the CP cable, nor do they require any module-specific settings. This minimises the installation space required for the electrical connections to the modules and valves.

Node types:

Fieldbus/control block
CP-03



CP fieldbus node
CP-E



CP installation system

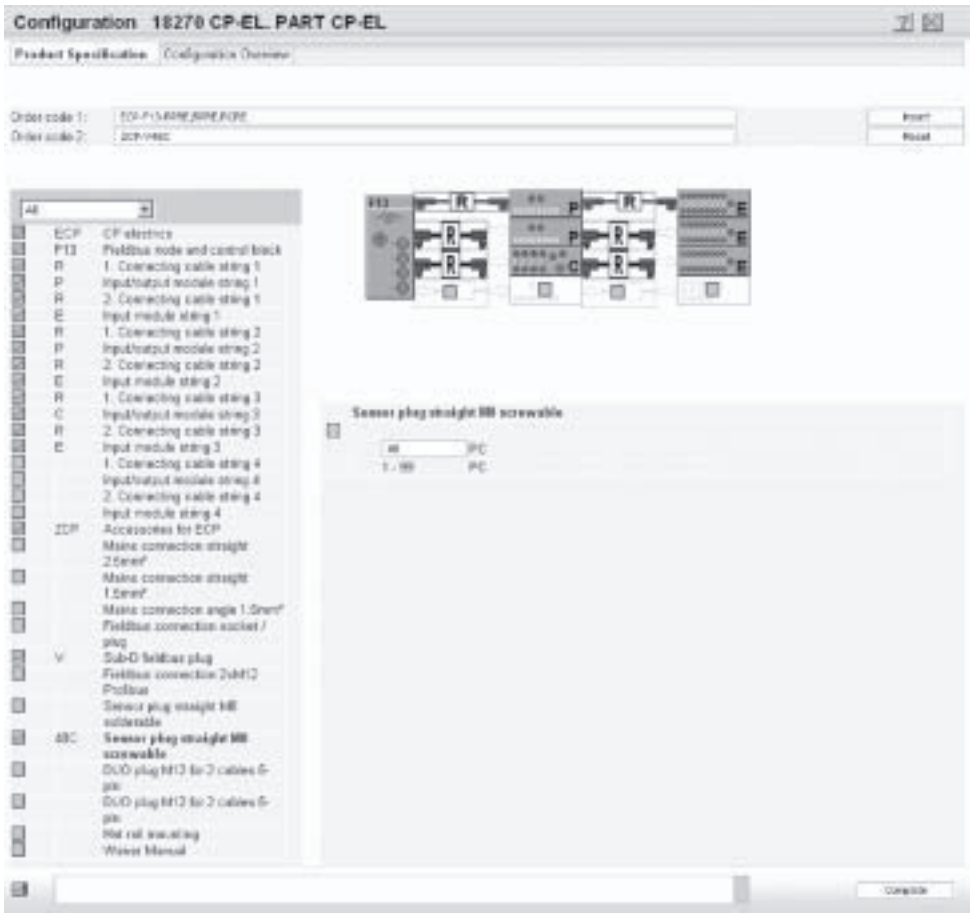
Ordering system

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

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

To order components from the CP system series, type ECP, use the order code.

Ordering system for type ECP
➔ 29



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 "Product Search" menu.

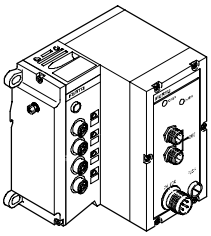
Here you can specify a "Module No." (e.g. 18270), the "Type" (e.g. ECP) or "Article name" (e.g. CP installation system) to find your "Search result". Click on the blue shopping basket to complete the selected product according to your specifications (this does not initiate an order). You will then be prompted to configure the product.

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

CP installation system

Peripherals overview

Fieldbus systems, programmable controllers



Fieldbus variants

Of the more than 20 different fieldbus systems (protocols) available on the market, some have emerged as the most important variants. Festo supports these by means of various fieldbus nodes (FBxx) on its valve terminals. Fieldbus systems require a powerful, central PLC and a master interface adapted to that particular fieldbus.

Fieldbus systems are generally used when several devices with many inputs/outputs, complex functions or high communication levels must be controlled. In this case, the advantages of simple cabling, easy diagnosis and maintenance outweigh the extra outlay for a fieldbus master interface and the necessary know-how.

Festo fieldbus

A fieldbus developed by Festo with simple prompting, supported by the controllers of the FPC, SF and IPC series (Festo FB5). A maximum of 98 bus stations can be connected to the Festo fieldbus. The bus can operate with 4 different baud rates (31.25; 62.5; 187.75 and 375 kbps).

Interbus

An open fieldbus standard, originally developed by Phoenix Contact and now in worldwide use. Important installation accessories such as bus plugs must be obtained from Phoenix or its partners (Festo FB6).

DeviceNet

An open fieldbus system based on CAN technology originally developed for the automotive sector. DeviceNet was originally developed by Rockwell (Allen Bradley) and is now an open standard (Festo FB11).

Profibus DP

An open fieldbus standard, originally developed by Siemens and in worldwide use (Festo FB13 for 12 MBd).

ABB CS31

The fieldbus from ABB connects a maximum of 63 fieldbus stations to the fieldbus master. The data is transferred at a constant baud rate of 187.5 kbps. The protocol is suitable for use in all areas of automation technology (Festo FB5).

Moeller SUCONET K

A maximum of 98 bus stations can be connected to the SUCONET K fieldbus. The bus operates with a baud rate of 187.5 or 375 kbps, depending on the design, bus length, etc. The bus interface is based on RS 485 with a master/slave structure (Festo FB5).

CP installation system

Peripherals overview

Control blocks

Controllers integrated in the Festo valve terminals permit the construction of stand-alone control units to IP65 – without control cabinets.

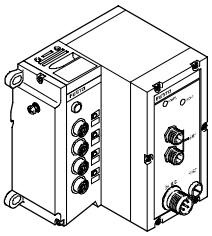
Using the slave operation mode, these valve terminals can be used for intelligent pre-processing and are therefore ideal modules for designing decentralised intelligence.

In the master operation mode, terminal groups can be designed with many options and functions, which can autonomously control a medium-sized machine/system.

Control block variants

Integrated Festo PLC

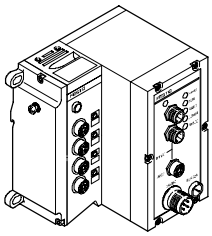
A high-performance miniature controller from Festo has been integrated into the SF3 valve terminal node. This provides stand-alone control of up to 128 inputs and 128 outputs.



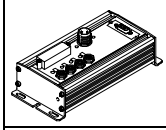
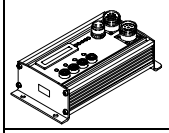
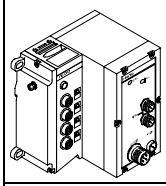
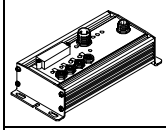
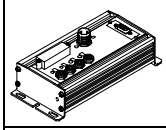
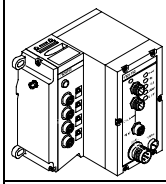
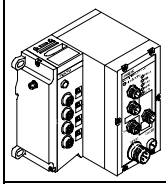
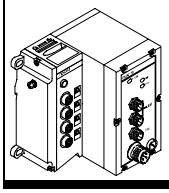
With the Festo fieldbus, additional I/O and expanded functions can be installed and controlled. The control block SF3 can be operated as required as a stand-alone operation, a fieldbus slave or master (with up to 31 fieldbus slaves and up to 1048 inputs and outputs).

Integrated Allen Bradley PLC – SLC embedded

A powerful SLC5/02 mini controller from Allen Bradley, integrated in the valve terminal node SB/SF60.



This provides stand-alone control of up to 128 inputs and 128 outputs. With the DeviceNet scanner of the SF60, additional I/O and expanded functions can be installed and controlled.
The control block SF60 can be operated optionally in stand-alone mode, as a DeviceNet slave or master (with up to 31 slaves).

Fieldbus/control block						
View	Node type	Fieldbus protocol	No. of strings	No. of I/Os	Plug type, bus connection	➔ Page
	FB5	Festo ABB CS31 Moeller SUCONET K	4	64/64	Sub-D	17
	FB6	Interbus			1x round socket M23 1x round plug M23	21
	FB8	Allen Bradley (1771 RIO)			2x round socket M12, 4-pin	25
	FB11	DeviceNet			1x round socket M12, 5-pin	29
	FB13	Profibus-DP (12 MBd)			Sub-D or 2x M12 Reversekey	33
	SB6	Allen Bradley control block, SLC embedded			2x round socket M12, 5-pin	37
	SF6	Allen Bradley control block, SLC embedded with DeviceNet			3x round socket M12, 5-pin	42
	SF3	Festo control block with fieldbus connection			3x round socket M12, 4-pin	46

CP installation system

Key features – Power supply

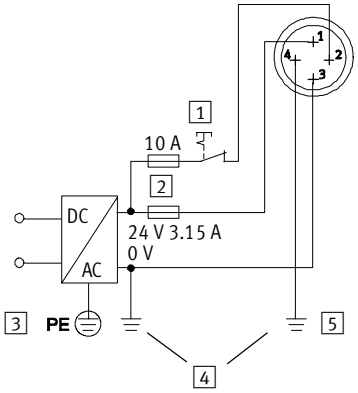
Operating voltage and load current supply

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

- Connection for data exchange
- Operating voltage for internal electronics
- Sensor power supply for the input modules

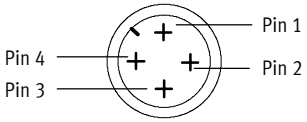
Every module in the CP installation system is protected separately against overload with electronic fuses.
Input modules without additional power supply provide a maximum sensor supply of 500 mA, while input modules with additional power supply provide up to 2 A of residual current for the connected sensors.

Example of circuit



1 Operating voltage (externally fused)
2 External fuses
3 Protective earth
4 Potential equalisation
5 Earth connection on pin 4, rated for 12 A

Pin allocation for fieldbus node power supply



Pin 1 24 V supply for electronics and inputs
Pin 2 24 V load supply for valves
Pin 3 0 V
Pin 4 Earth terminal

CP installation system

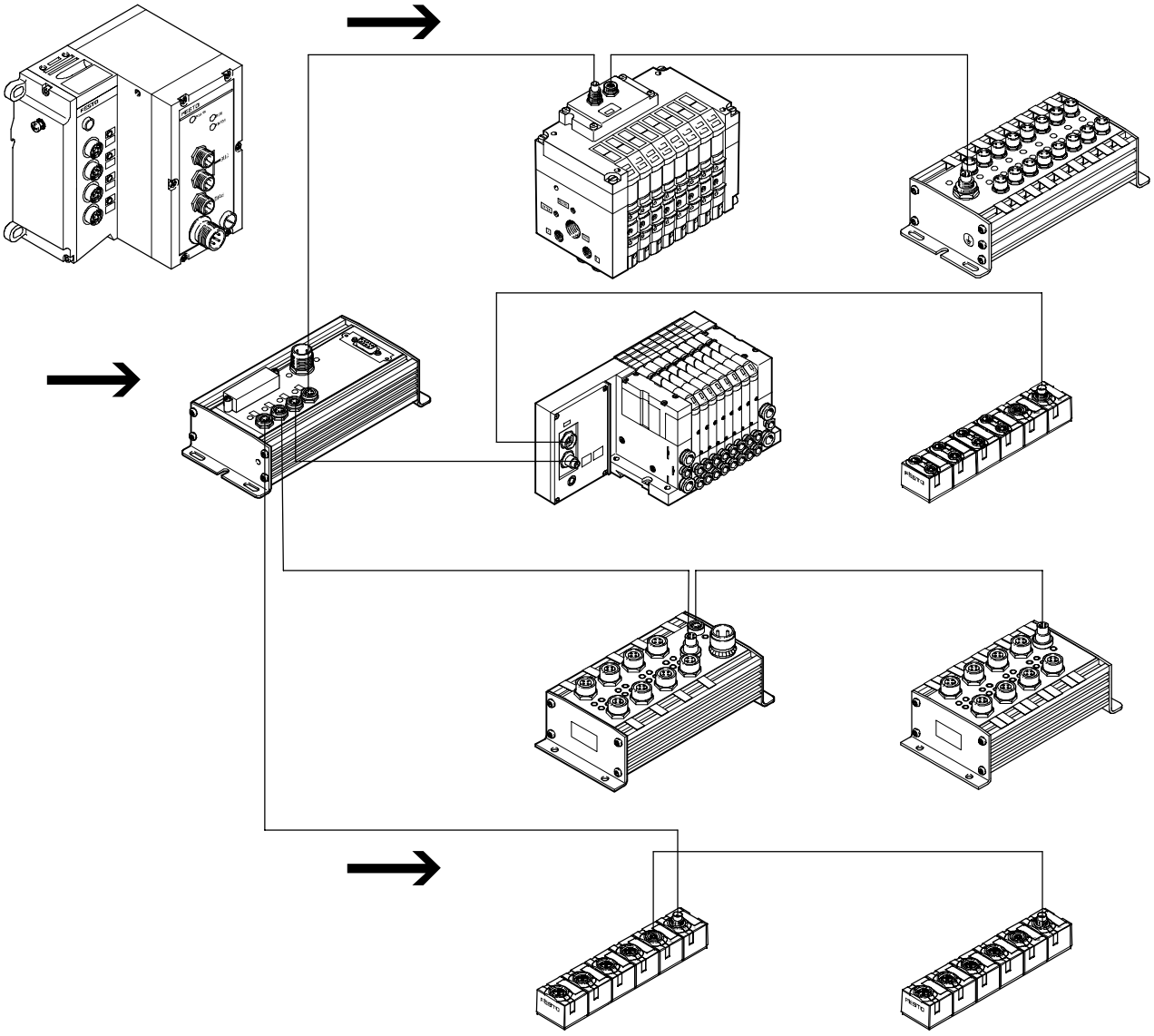
Key features – CP converter

Connection of valve terminal and input modules via CP converter

Central power supply
- Operating voltage for the modules
- Sensor supply for the input modules
- Load voltage for valves

Central at the CP converter:
Distribution of the power supply to the individual valve terminals and modules of the CP system. Transmission of I/O and diagnostic data.

Distributed to each I/O module:
- Electronic fuses to provide overload protection
- Voltage failure detection
- Monitoring of the load voltage level of the valves for reliable operation



CP installation system

Key features – Diagnosis

Diagnosis – Fieldbus node

Comprehensive diagnosis available for every CP string.
Diagnostic information can either be detected with the LEDs or read out and evaluated for a specific fieldbus using the PLC program.

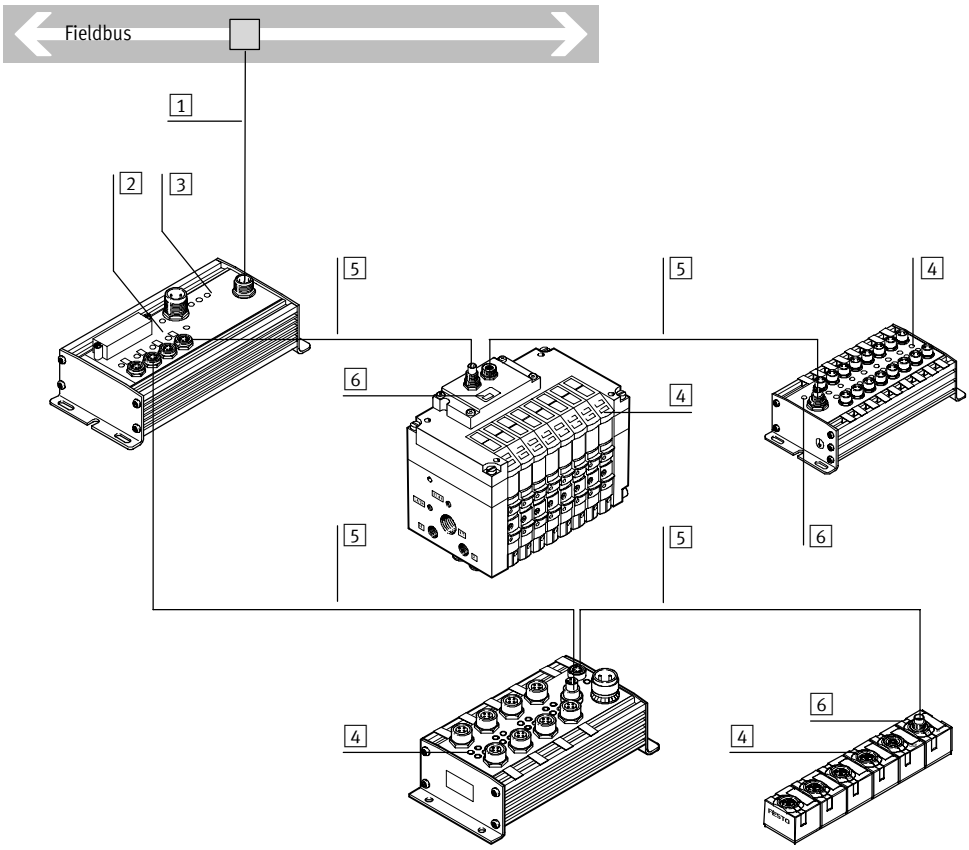
Diagnosis via LED

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

There are also bus-specific LED displays.

Diagnosis via PLC program, for example:

- Configuration errors
- Bus errors
- 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)

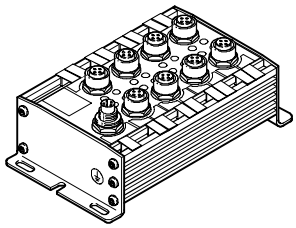


1 Diagnosis via fieldbus
2 String diagnosis via LED on fieldbus node
3 Bus-specific LED
4 Status indicator on CP module
5 Diagnosis via CP string
6 Diagnosis via LED on CP module

CP installation system

Key features – I/O modules

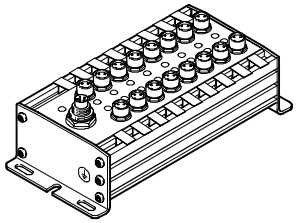
Input/output modules (sturdy)



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

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

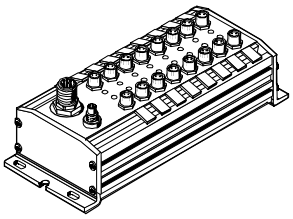
- M12 plug, double allocation
- 1x M9 CP connection
- PNP/NPN, IP65



CP-E16-M8
CP-E16N-M8

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

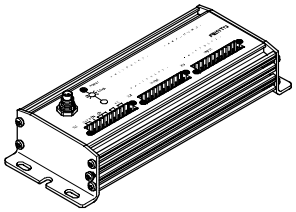
- M8 plug, single allocation
- 1x M9 CP connection
- PNP/NPN, IP65



CP-E16-M8-Z

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

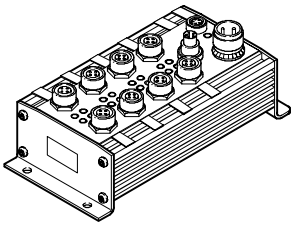
- Electrical isolation through additional power supply
- M8 plug, single allocation
- 1x M9 CP connection
- Separate sensor supply
- PNP/NPN, IP65



CP-E16-KL-IP20-Z

- 2x 8 inputs 24 V DC
- Signal status display via 16 LEDs
- Operating status display

- Screw terminal or tension-spring sockets
- 1x M9 CP connection
- Separate sensor supply
- PNP/NPN, IP20



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

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

CP installation system

Key features – I/O modules

CP input/output modules (compact)

In addition to the sturdy CP I/O modules there is the new compact series of CP I/O 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).

They are designed for use in handling and assembly wherever space requirements and product weight play a role. The modules can be used in connection with the following valve terminals:
- CPV, CPA
- Fieldbus Direct
- CPV-SC, CPA-SC
- CPX-CP interface
- CDVI

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

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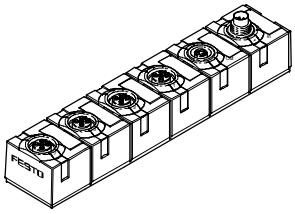
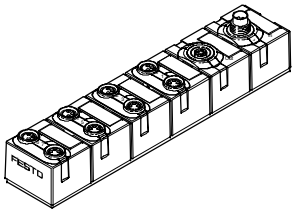
➔ Page 11
➔ Page 12



CP-E08-M12x2-CL

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

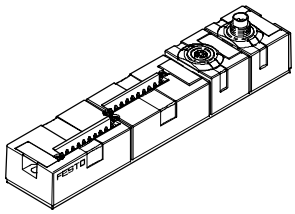
- 4x M12 plug, 5-pin, double allocation
- 2x M9 CP connection
- PNP, IP65/67



CP-E08-M8-CL

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

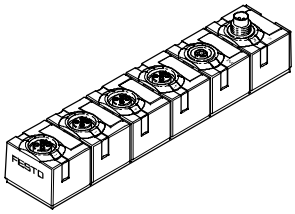
- 8x M8 plug, 3-pin, single allocation
- 2x M9 CP connection
- PNP, IP65/67



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

- Tension-spring sockets
- 2x M9 CP connection
- PNP, IP20

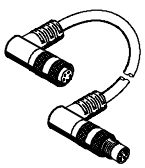


CP-A04-M12x2-CL

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

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

CP connecting cables



KVI-CP-1-...
KVI-CP-2-...

The CP string is connected using pre-assembled CP cables, which are supplied in lengths from 0.5 to 8 metres.

- M9 plug/socket, 5-pin
- Straight/angled version in any combinations
- Suitable for chain link trunking as KVI-CP-2-...

Mounting options

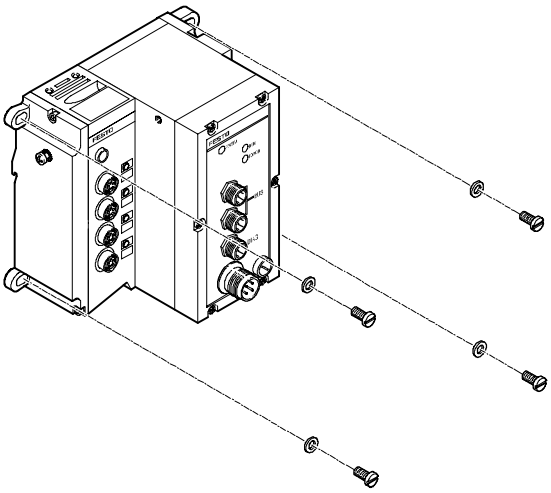
CP modules

The components of the CP system are designed for the following mounting methods:

- Wall mounting using through-holes
- H-rail mounting using adapter kit

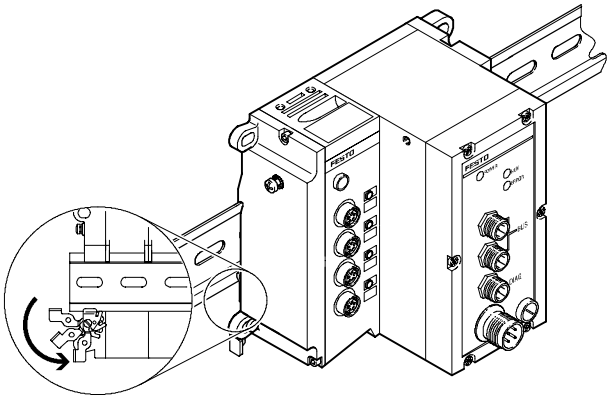
Mounting with standard housing (bus node type 03)

Wall mounting



- Using the four holes, the standard housing (with screws up to 6 mm in diameter) can be mounted on even surfaces in just about any position.

H-rail mounting



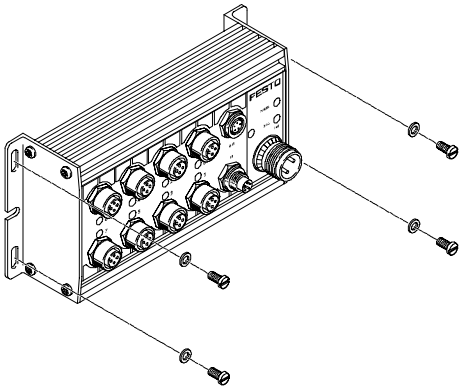
- A guide groove for attaching in the H-rail is located on the rear side of the standard housing.

For mounting you will need the H-rail clamping unit:
- IBGH-03-4,0 or
- IBGH-03-7,0

These permit mounting on H-rails to DIN EN 50 022.

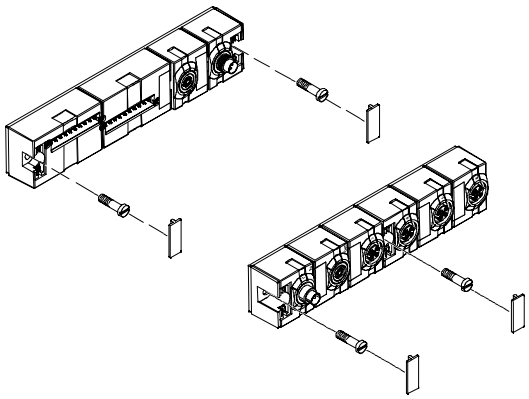
Mounting with CP modules

Wall mounting – Sturdy CP modules



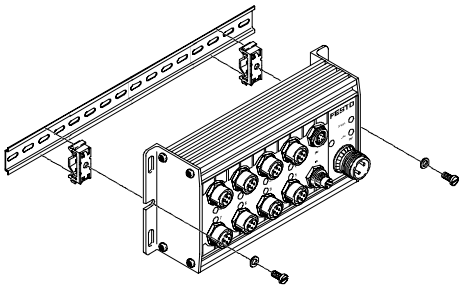
- Using the elongated holes, the CP modules (with screws up to 4 mm in diameter) can be mounted on even surfaces in just about any position.

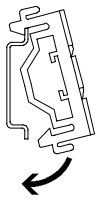
Wall mounting – Compact CP modules



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

H-rail mounting





- For the CP modules there is a mounting kit (CP-TS-HS35) that can be used on an H-rail.
- This permits mounting on H-rails to DIN EN 50 022.
- The mounting kit comes with 2 screws 4 x M12 as well as 2 washers.

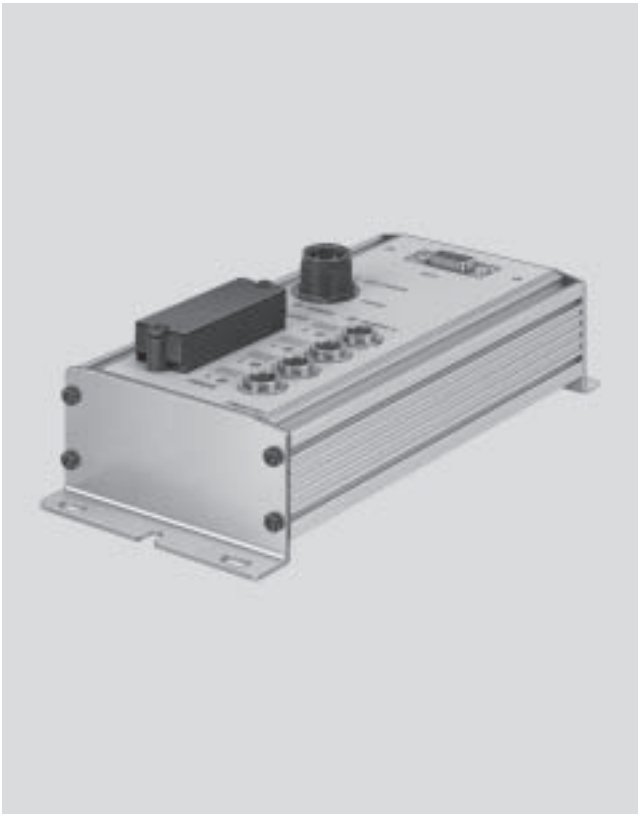
Screw the housing onto the mounting
The mounting and the housing are attached to the H-rail by tightening the screws.

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.

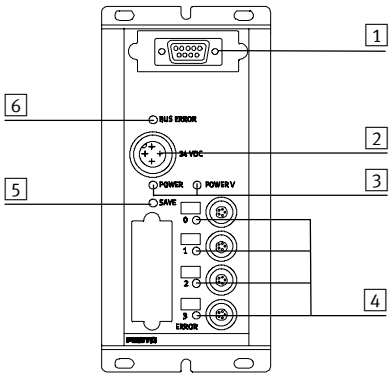
- Note

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 ➔ Info 213 and 214 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

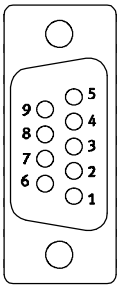
Connection and display components

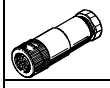
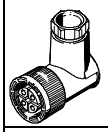
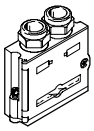
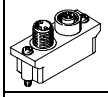
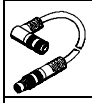
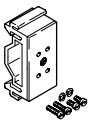
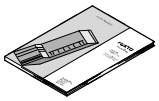
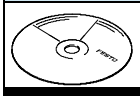
The following connection and display components can be found on the bus node cover:



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

Pin allocation for fieldbus interface (plug view)

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

Ordering data				
Designation			Type	Part No.
Power supply				
	Power supply socket, straight	for 1.5 mm^2	**NTSD-GD-9**	**18 493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm^2	**NTSD-WD-9**	**18 527**
		for 2.5 mm^2	**NTSD-WD-11**	**533 119**
Fieldbus connection				
	Fieldbus socket, Sub-D connection		**FBS-Sub-9-GS-DP-B**	**532 216**
	M12 adapter		**FBA-2-M12-5POL-RK**	**533 118**
Valve terminal connection				
	Connecting cable WS-WD	0.5 m	**KVI-CP-1-WS-WD-0,5**	**178 564**
		1 m	**KVI-CP-1-WS-WD-1.0**	**191 892**
		2 m	**KVI-CP-1-WS-WD-2**	**163 139**
		3 m	**KVI-CP-1-WS-WD-3.0**	**191 893**
		5 m	**KVI-CP-1-WS-WD-5**	**163 138**
	Connecting cable GS-WD	5 m	**KVI-CP-1-GS-WD-5**	**163 137**
		8 m	**KVI-CP-1-GS-WD-8**	**163 136**
	Connecting cable GS-GD	2 m, for chain link trunking	**KVI-CP-2-GS-GD-2**	**170 234**
		5 m, for chain link trunking	**KVI-CP-2-GS-GD-5**	**170 235**
		8 m, for chain link trunking	**KVI-CP-2-GS-GD-8**	**165 616**
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**
Software				
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

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

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

Application

Bus connection

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

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

Implementation

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

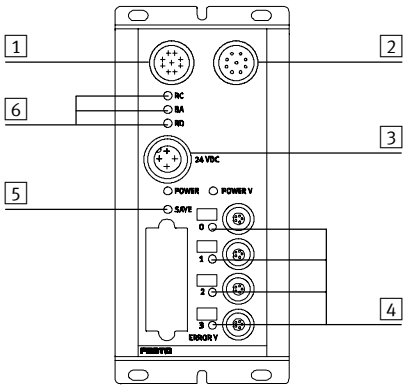
- Note

Please observe the general guidelines regarding addressing when assigning outputs.

General technical data		
Type		**CP-FB06-E**
Part No.		**18 225**
Baud rates		500 kbps
ID code		3
No. of process data bits		16, 32, 48 or 64 depending on expansion
PCP channel		No
Configuration support		Icon file for CMD software Station description file with CMD software
Max. no. of solenoid coils		64
Max. no. of outputs incl. solenoid coils		64
Max. no. of inputs		64
LED diagnostic indicators	Power	Power supply indicator for internal electronics
	Power V	Power supply indicator for valves
	0...3	CP string LED
	RC	Remotebus check
	BA	Bus active
	RD	Remotebus disable
Device-specific diagnostics transmitted to the controller as common message (peripherals errors)		■ Short circuit/overload of outputs ■ Undervoltage of valves ■ Undervoltage of outputs ■ Undervoltage of sensor supply
Additional functions		Test routine for checking the valves and outputs without bus communication
Operating voltage	Nominal value	24 V DC polarity-safe
	Permissible range	20.4 ... 26.4 V
	Power failure buffering	20 ms
Current consumption pin 1	Fieldbus node	250 mA
	CP modules	560 mA (internal electronics) + total current consumption of inputs
Current limiting	Electronics of fieldbus node and CP connection	Max. 1.25 A, short circuit proof
Load voltage pin 2	Solenoid valves	Total of all valves switched simultaneously, see technical data on CP valves ➔ Info 213 and 214 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

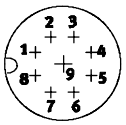
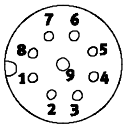
Connection and display components

The following connection and display components can be found on the bus node cover:

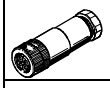
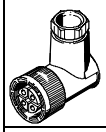
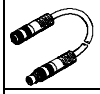
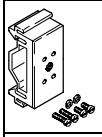
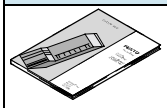
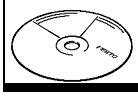


1 Remote bus incoming
2 Remote bus outgoing
3 Voltage supply connection
4 String LEDs
5 Save key
6 Interbus-specific LEDs

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

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

1) Pins not listed here must not be connected.

Ordering data				
Designation			Type	Part No.
Power supply				
	Power supply socket, straight	for 1.5 mm²	**NTSD-GD-9**	**18 493**
		for 2.5 mm²	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm²	**NTSD-WD-9**	**18 527**
		for 2.5 mm²	**NTSD-WD-11**	**533 119**
Valve terminal connection				
	Connecting cable WS-WD	0.5 m	**KVI-CP-1-WS-WD-0,5**	**178 564**
		1 m	**KVI-CP-1-WS-WD-1.0**	**191 892**
		2 m	**KVI-CP-1-WS-WD-2**	**163 139**
		3 m	**KVI-CP-1-WS-WD-3.0**	**191 893**
		5 m	**KVI-CP-1-WS-WD-5**	**163 138**
	Connecting cable GS-WD	5 m	**KVI-CP-1-GS-WD-5**	**163 137**
		8 m	**KVI-CP-1-GS-WD-8**	**163 136**
	Connecting cable GS-GD	2 m, for chain link trunking	**KVI-CP-2-GS-GD-2**	**170 234**
		5 m, for chain link trunking	**KVI-CP-2-GS-GD-5**	**170 235**
		8 m, for chain link trunking	**KVI-CP-2-GS-GD-8**	**165 616**
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**
Software				
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

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.

CP outputs are supplied on a decentralised basis.
The FB8 fieldbus node supports the 1771 Remote I/O fieldbus from Allen Bradley/Rockwell Automation.
- 1771 Remote I/O

Application

Bus connection

The FB8 node has 2 M12 plugs with 4 connections for connecting to the Remote interface. The two plugs are connected internally, so that either a branch line installation can be performed with one cable, or 2 cables can be routed to the node, connected to the two plugs and looped through.

Implementation

The FB8 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.

No other type 03 modules (I/Os) or valves can be connected.

- Note

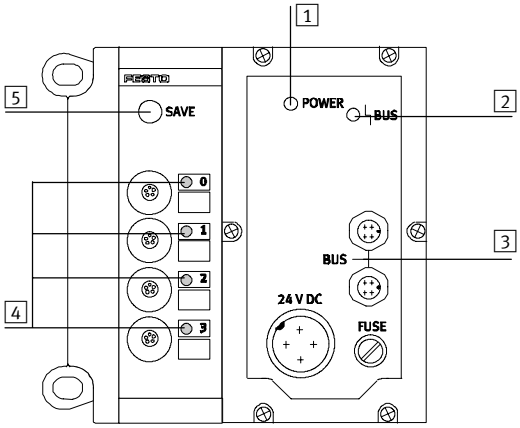
Please observe the general guidelines on I/O addressing when assigning the outputs.

General technical data		
Type		**CP-FB08-03**
Part No.		**18 240**
Combination with analogue modules		No
Combination with AS-interface master		No
Baud rates		Set using HW switch ■ 57.6 kbps ■ 115.2 kbps ■ 230.4 kbps
Addressing range		The maximum rack number and I/O group depends on the controller connected. With PLC-3 up to rack no. 30 group 4/5.
Emulated product		Remote Rack Quarter rack or half rack
Configuration support		Automatic configuration as a quarter or half rack
Max. no. of solenoid coils		64
Max. no. of outputs incl. solenoid coils		64
Max. no. of inputs		64
LED diagnostic indicators	Power	Operating status
	Bus	Error status
	0...3	CP string LED
Operating voltage pin 1	Nominal value	24 V DC polarity-safe
	Permissible range	18 ... 30 V
	Power failure buffering	20 ms
Current consumption pin 1	Fieldbus node	200 mA
	CP module	560 mA (internal electronics) + total current consumption of inputs, internal
Load voltage pin 2	Nominal value	24 V DC
	Valves	20.4 ... 26.4 V
Current consumption pin 2		Total of all valves switched simultaneously, see technical data on CP valves ➔ Info 213 and 214 Compact Performance valve terminals CPV and CPA
Protection class to EN 60 529		IP65
Temperature range	Operation	–5 ... +50 °C
	Storage	–20 ... +70 °C
Materials	Housing	Die-cast aluminium
	Cover	Polyamide
Dimensions[1] (LxWxD)		162 x 118.7 x 132 mm
Grid dimension		72 mm
Weight		1550 g

1) Consisting of bus node, CP interface as well as left and right end plate

Connection and display components

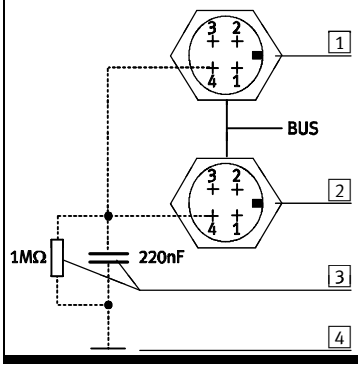
The following connection and display components can be found on the bus node cover:



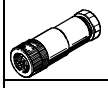
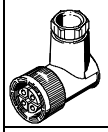
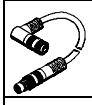
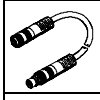
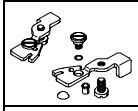
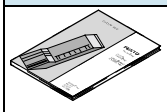
1 Red LED for operating voltage
2 Green LED for error on bus
3 RIO interface
4 String LEDs
5 Save key

Pin allocation for RIO interface

Pin allocation



	Pin No.	Signal
1 Plug 1	1	S+/Bus2
	2	n.c.
	3	S–/Bus2
	4	Screen/shield
2 Plug 2	1	S+/Bus1
	2	n.c.
	3	S–/Bus21
	4	Screen/shield
3 Internal network		
4 Housing/node		

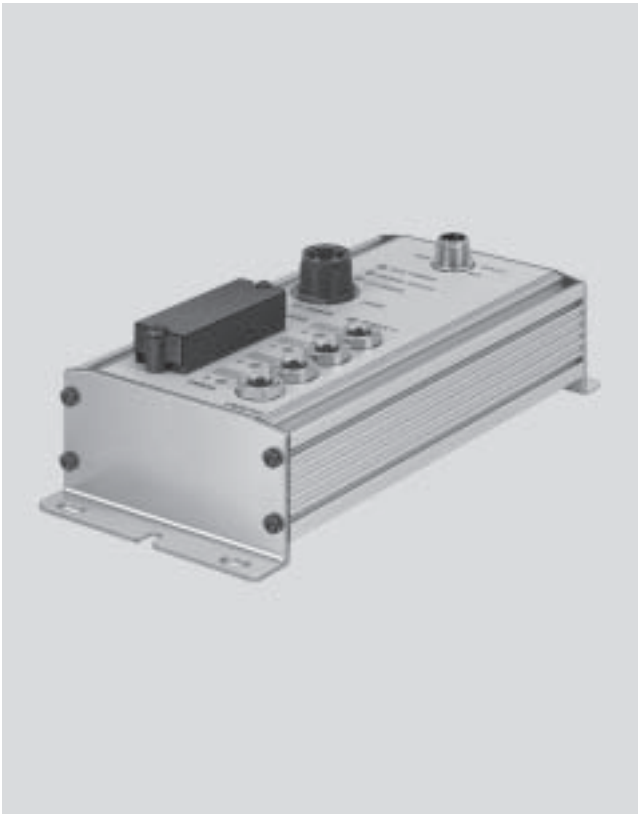
Ordering data				
Designation			Type	Part No.
Power supply				
	Power supply socket, straight	for 1.5 mm^2	**NTSD-GD-9**	**18 493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm^2	**NTSD-WD-9**	**18 527**
		for 2.5 mm^2	**NTSD-WD-11**	**533 119**
Fieldbus connection				
	Bus connection, straight	PG7	**FBSD-GD-7**	**18 497**
		PG9	**FBSD-GD-9**	**18 495**
		PG13.5	**FBSD-GD-13,5**	**18 496**
	Bus connection, angled	PG7	**FBSD-WD-7**	**18 524**
		PG9	**FBSD-WD-9**	**18 525**
Valve terminal connection				
	Connecting cable WS-WD	0.5 m	**KVI-CP-1-WS-WD-0,5**	**178 564**
		1 m	**KVI-CP-1-WS-WD-1.0**	**191 892**
		2 m	**KVI-CP-1-WS-WD-2**	**163 139**
		3 m	**KVI-CP-1-WS-WD-3.0**	**191 893**
		5 m	**KVI-CP-1-WS-WD-5**	**163 138**
	Connecting cable GS-WD	5 m	**KVI-CP-1-GS-WD-5**	**163 137**
		8 m	**KVI-CP-1-GS-WD-8**	**163 136**
	Connecting cable GS-GD	2 m, for chain link trunking	**KVI-CP-2-GS-GD-2**	**170 234**
		5 m, for chain link trunking	**KVI-CP-2-GS-GD-5**	**170 235**
		8 m, for chain link trunking	**KVI-CP-2-GS-GD-8**	**165 616**
Mounting				
	Mounting for H-rail		**IBGH-03-4,0**	**18 649**
User documentation				
	User documentation – Bus node CP-FB08-03	German	**P.BE-CP-FB08-03-DE**	**165 108**
		English	**P.BE-CP-FB08-03-EN**	**165 208**
		French	**P.BE-CP-FB08-03-FR**	**165 138**
		Italian	**P.BE-CP-FB08-03-IT**	**165 168**
		Spanish	**P.BE-CP-FB08-03-ES**	**165 238**
		Swedish	**P.BE-CP-FB08-03-SV**	**165 268**
Software				
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

DeviceNet

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

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

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



Application

Bus connection

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

Implementation

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

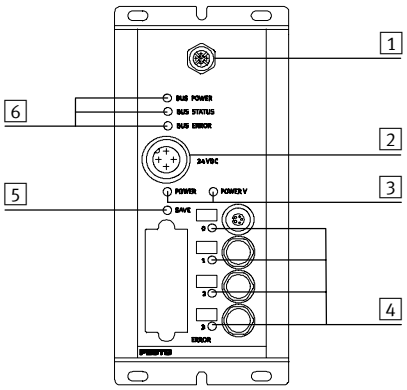
- Note

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

General technical data		
Type		**CP-FB11-E**
Part No.		**18 227**
Baud rates		Set using HW switch ■ 125 kbps ■ 250 kbps ■ 500 kbps
Addressing range		Set using 2 rotary switches 0 ... 63
Product type		Communication converter (12 dec.)
Product code		2282 hex./35050 dec.
Type of communication		Polling/Cos/Bit Strobe
Configuration support		EDS file and graphics symbol
Max. no. of solenoid coils		64
Max. no. of outputs and solenoid coils		64
Max. no. of inputs		64
LED diagnostic indicators	Bus/Power	Operating voltage of bus
	Module status	Operating status
	I/O Error	Internal error
Device-specific diagnosis via DeviceNet		■ Short circuit/overload of outputs ■ Undervoltage of valves ■ Undervoltage of outputs ■ Undervoltage of sensor supply ■ Interrupt point on CP string
Operating voltage	Nominal value	24 V DC polarity-safe
	Permissible range	20.4 ... 26.4 V
	Power failure buffering	20 ms
Current consumption pin 1	Fieldbus node	250 mA
	CP module	560 mA (internal electronics) + total current consumption of inputs, internal
Current limiting	Electronics of fieldbus node and CP connection	Max. 1.25 A, short circuit proof
Current consumption pin 2	Solenoid valves	Total of all valves switched simultaneously, see technical data on CP valves ➔ Info 213 and 214 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

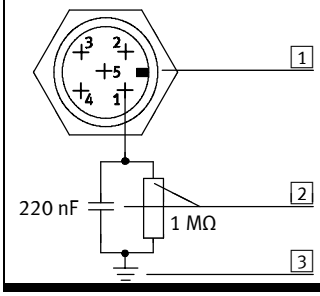
Connection and display components

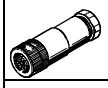
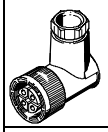
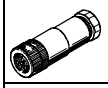
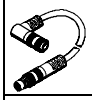
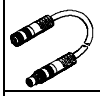
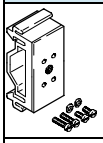
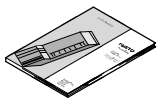
The following connection and display components can be found on the bus node cover:



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

Pin allocation for fieldbus interface

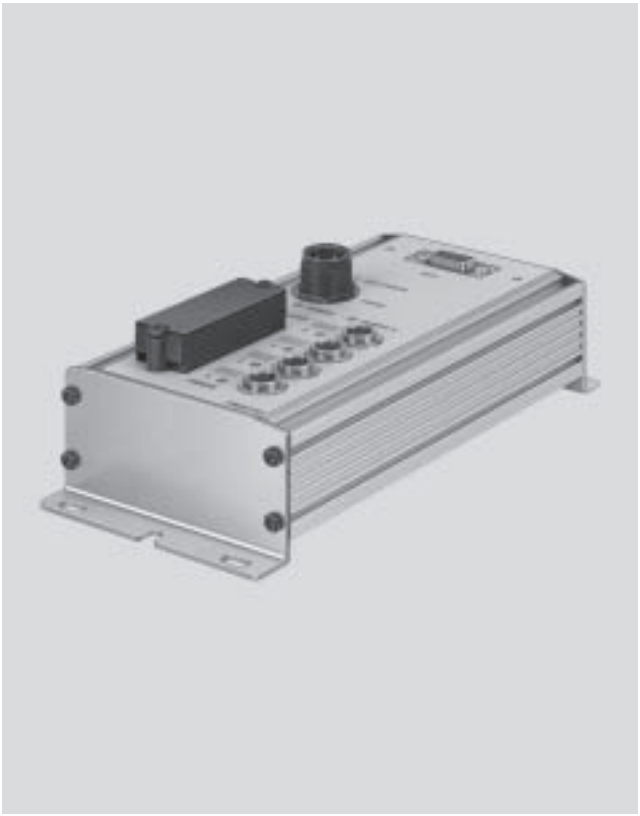
Pin allocation		Pin No.	Signal
	1 Plug	1	Screen
		2	+24 V bus
		3	GND Bus
		4	Data+
		5	Data–
	2 Housing of the fieldbus connection module PE		
	3 Internal screening connection in the valve terminal		

Ordering data				
Designation			Type	Part No.
Power supply				
	Power supply socket, straight	for 1.5 mm^2	**NTSD-GD-9**	**18 493**
		for 2.5 mm^2	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm^2	**NTSD-WD-9**	**18 527**
		for 2.5 mm^2	**NTSD-WD-11**	**533 119**
Fieldbus connection				
	Bus connection, straight, PG9, 5-pin		**FBSD-GD-9-5POL**	**18 324**
Valve terminal connection				
	Connecting cable WS-WD	0.5 m	**KVI-CP-1-WS-WD-0,5**	**178 564**
		1 m	**KVI-CP-1-WS-WD-1.0**	**191 892**
		2 m	**KVI-CP-1-WS-WD-2**	**163 139**
		3 m	**KVI-CP-1-WS-WD-3.0**	**191 893**
		5 m	**KVI-CP-1-WS-WD-5**	**163 138**
	Connecting cable GS-WD	5 m	**KVI-CP-1-GS-WD-5**	**163 137**
		8 m	**KVI-CP-1-GS-WD-8**	**163 136**
	Connecting cable GS-GD	2 m, for chain link trunking	**KVI-CP-2-GS-GD-2**	**170 234**
		5 m, for chain link trunking	**KVI-CP-2-GS-GD-5**	**170 235**
		8 m, for chain link trunking	**KVI-CP-2-GS-GD-8**	**165 616**
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**
Software				
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

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

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

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



Application

Bus connection

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

- Note

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

Implementation

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

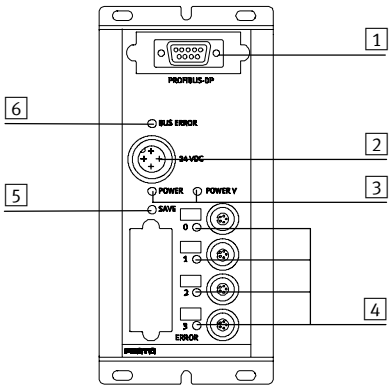
- Note

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

General technical data		
Type		**CP-FB13-E**
Part No.		**174 337**
Baud rates		Automatic detection 9.6 kBaud ... 12 MBaud
Addressing range		Set using 2 DIL switches 1 ... 125
Product family		4: Valves
Ident. number		0xFB13
Type of communication		Cyclic communication
Configuration support		GSD file and bitmaps
Max. no. of solenoid coils		64
Max. no. of outputs and solenoid coils		64
Max. no. of inputs		64
LED diagnostic indicators	Power	Operating voltage of electronics
	Power V	Operating voltage of valves and outputs
	Bus Error	Communication error
	0...3	CP string
Device-specific diagnostics via Profibus-DP		■ Short circuit/overload of outputs ■ Undervoltage of valves ■ Undervoltage of outputs ■ Undervoltage of sensor supply ■ Interrupt points on CP string
Additional functions		■ Test routine for checking the valves and outputs without bus communication
Operating voltage	Nominal value	24 V DC polarity-safe
	Permissible range	20.4 ... 26.4 V
	Power failure buffering	20 ms
Current consumption pin 1	Fieldbus node	250 mA
	CP module	560 mA (internal electronics) + total current consumption of inputs, internal
Current limiting	Electronics of fieldbus node and CP connection	Max. 1.25 A, short circuit proof
Current consumption pin 2	Solenoid valves	Total of all valves switched simultaneously, see technical data on CP valves ➔ Info 213 and 214 Compact Performance valve terminals CPV and CPA
Current limiting	Supply for solenoid valves	Max. 2.5 A, fused
Protection class to EN 60 529		IP65
Temperature range	Operation	–5 ... +50 °C
	Storage/transport	–20 ... +70 °C
Materials	Housing	Die-cast aluminium
Dimensions (LxWxD)		196.4 x 88 x 61.5 mm
Grid dimension		72 mm
Weight		925 g

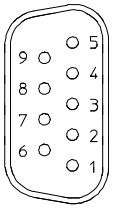
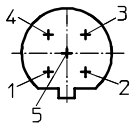
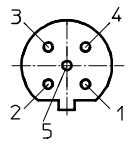
Connection and display components

The following connection and display components can be found on the bus node cover:

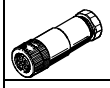
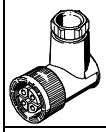
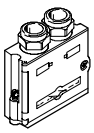
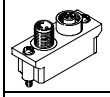
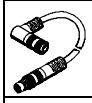
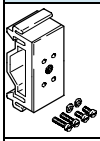
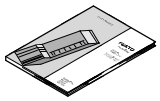


1 Plug for fieldbus cable
2 Operating voltage connection for CP and valves
3 Operating voltage LEDs
4 String LEDs
5 Save key
6 Bus-specific LED

Pin allocation for Profibus DP interface

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

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

Ordering data				
Designation			Type	Part No.
Power supply				
	Power supply socket, straight	for 1.5 mm²	**NTSD-GD-9**	**18 493**
		for 2.5 mm²	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm²	**NTSD-WD-9**	**18 527**
		for 2.5 mm²	**NTSD-WD-11**	**533 119**
Fieldbus connection				
	Plug Sub-D, for Profibus DP		**FBS-SUB-9-GS-DP-B**	**532 216**
	Bus connection 2x M12 adapter plug (B-coded) for Profibus DP		**FBA-2-M12-5POL-RK**	**533 118**
Valve terminal connection				
	Connecting cable WS-WD	0.5 m	**KVI-CP-1-WS-WD-0,5**	**178 564**
		1 m	**KVI-CP-1-WS-WD-1.0**	**191 892**
		2 m	**KVI-CP-1-WS-WD-2**	**163 139**
		3 m	**KVI-CP-1-WS-WD-3.0**	**191 893**
		5 m	**KVI-CP-1-WS-WD-5**	**163 138**
	Connecting cable GS-WD	5 m	**KVI-CP-1-GS-WD-5**	**163 137**
		8 m	**KVI-CP-1-GS-WD-8**	**163 136**
	Connecting cable GS-GD	2 m, for chain link trunking	**KVI-CP-2-GS-GD-2**	**170 234**
		5 m, for chain link trunking	**KVI-CP-2-GS-GD-5**	**170 235**
		8 m, for chain link trunking	**KVI-CP-2-GS-GD-8**	**165 616**
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**
Software				
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

CP installation system

The control block ISB60-03 is an Allen Bradley SLC500 controller, integrated in a sturdy aluminium housing to protection class IP65.

Application

All plugs and electrical connections are designed for direct mounting on the machine (provided that the requirements of IP65 are adhered to). The SLC5/02 processor technology licensed by Rockwell Automation provides computing power which is tailored to the requirements of a fully expanded valve terminal or a CP system. The controller is programmed using Allen Bradley's standard RSLogix500 programming software. The online connection to the PC is established using the pre-assembled programming cable.
The control block SB60 is a highly compact solution; a stand-alone controller for CP valves and CP I/O modules connected via the CP system.

The combination of tried and tested technology in the form of pneumatic valves from Festo and controller technology from Allen Bradley produces the most compact function unit for controlling pneumatically driven movements.
The elimination of internal wiring to the controller reduces the number of connection points required, thereby shortening the installation time and eliminating sources of potential errors.

The performance of the controller technology was selected and specially customised to meet the requirements of a valve terminal. Extensive diagnostic information stored in the controller's M1 file provides information on the status of all components mounted on the valve terminal as well as the sensors and actuators connected to it. MIDI/MAXI/ISO valves can, like the electrical I/O modules from the range of electrical peripherals type 03/04, be expanded or combined.

General technical data		
Type		**CP-SB60-03**
Part No.		**175 412**
Processor type		SLC5/02
Processor speed		4.8 ms/K
Memory capacity	Data words	16 K
	Program memory	4 K
No. of programs	Main program	1
	Max. subprograms	156
Decentralised outputs via CP interface		4 strings, each with 16 inputs
Decentralised inputs via CP interface		4 strings, each with 16 inputs
CPV/CPA valve terminals via CP interface		4 CPV/CPA valve terminals with max. 16 solenoid coils per terminal
LED diagnostic displays		Identical to those for SLC5/02 processor
Device-specific diagnosis		■ Short circuit, electrical output ■ Undervoltage of valves ■ Undervoltage of electrical outputs ■ Undervoltage of sensor supply ■ Enhanced CP string diagnostics ■ Monitoring of the valve terminal configuration
Operating voltage pin 1	Nominal value	24 V DC polarity-safe
	Permissible range	18 ... 30 V
	Power failure buffering	20 ms
Current consumption pin 1	Control block	200 mA
	CP modules	560 mA (internal electronics) + total current consumption of inputs
Load voltage pin 2	Nominal value	24 V DC
	Valves	20.4 ... 26.4 V
Current consumption pin 2		Total of all valves switched simultaneously, see technical data on CP valves ➔ Info 213 and 214 Compact Performance valve terminals CPV and CPA
Current consumption		200 mA + total current consumption of inputs, internal
Protection class to EN 60 529		IP65
Temperature range	Operation	–5 ... +50 °C
	Storage	–20 ... +70 °C
Materials	Housing	Die-cast aluminium
	Cover	Polyamide
Dimensions[1] (LxWxD)		162 x 148.7 x 132 mm
Grid dimension		72 mm
Weight		1750 g

1) Dimensions consisting of control block, CP interface as well as left and right end plate

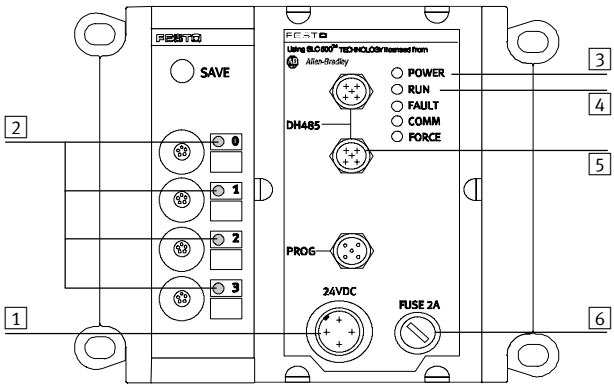
Integrated DH-485 coupling

The network DH-485 is an integral element of the control block. This network allows different control blocks and the Allen Bradley controllers to exchange data in a peer-to-peer arrangement. Pre-assembled connecting cables for the connection of all current HMI control units such as Panel View, DTAM Micro and DTAM Plus to the control block are available as accessories.

The network DH-485 together with the necessary DH-485 link coupler are generally integrated in the control block. The consistent integration of all necessary components in the housing of the control block means that the network DH-485 can be expanded to include a valve terminal in the field whilst maintaining protection class IP65.

Connection and display components

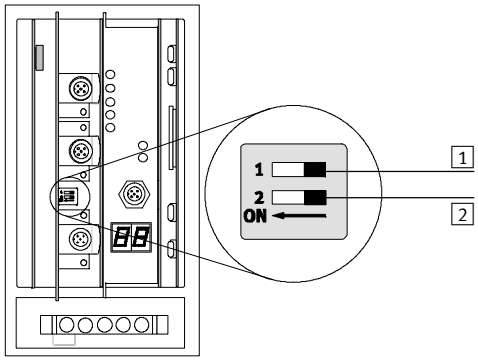
The following connection and display components can be found on the control block cover:



1 Operating voltage connection
2 String LEDs
3 Red LED / POWER
4 Green LED / RUN
5 Plug for DH-485
6 Fuse for operating voltage of inputs

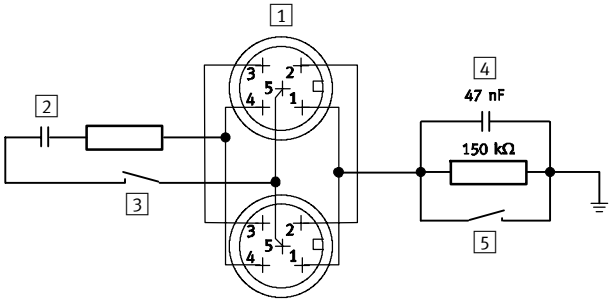
DIP switch settings

The control block is equipped with DIP switches for activating the DH-485 bus terminal.



1 On: Bus terminal activated
Off (condition upon delivery): Bus terminal not activated
2 On: Earthing of the DH-485 screen activated
Off (condition upon delivery): DH-485 screen not activated

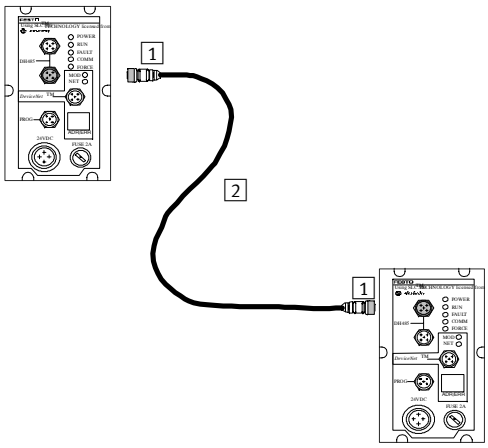
Positioning of the DIP switches for the bus terminal and earth on the DH-485



1 Connection of the DH-485 to the control block
2 DH-485 bus terminal
3 DIP switch 1
4 DH-485 earth
5 DIP switch 2

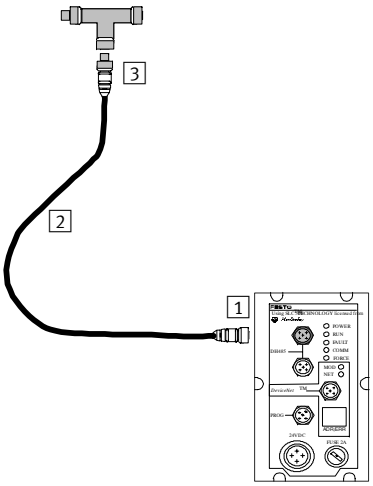
Connection examples

Cable for DH-485 is looped through

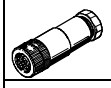
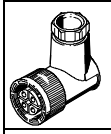
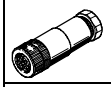
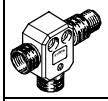
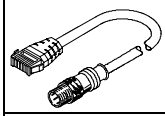
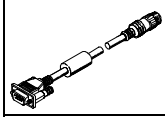
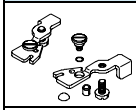
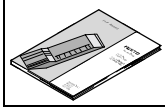
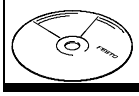


1 Connection socket, straight, 5-pin
2 Belden cable

Cable for T-adapter



1 Connection socket, straight, 5-pin
2 Belden cable
3 Straight plug, 5-pin for T-adapter

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 socket, straight, 5-pin		**FBSD-GD-9-5POL**	**18 324**
	Plug, straight, 5-pin for T-adapter		**FBS-M12-5GS-PG9**	**175 380**
	T-adapter for DH-485		**FB-TA-M12-5POL**	**171 175**
Diagnostic/data connection				
	Programming cable	3 m	**KDI-SB60-3,0-M12**	**171 173**
		6 m	**KDI-SB60-6,0-M12**	**175 686**
		10 m	**KDI-SB60-10,0-M12**	**171 174**
	Cable for DTAM Micro	3 m	**KDTAM-SB60-3-M12**	**188 979**
		6 m	**KDTAM-SB60-6-M12**	**188 980**
		10 m	**KDTAM-SB60-10-M12**	**188 981**
Mounting				
	Mounting for H-rail		**IBGH-03-4,0**	**18 649**
User documentation				
	User documentation – Control block SB60	German	**P.BE-VISB60-03-DE**	**184 572**
		English	**P.BE-VISB60-03-EN**	**184 573**
		Spanish	**P.BE-VISB60-03-ES**	**184 575**
Software				
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

DeviceNet

The SF60 control block is an Allen Bradley SLC500 controller with an additional DeviceNet link enclosed in a sturdy aluminium housing protected to IP65.

Application

In addition to the SLC5/02 processor, the SF60 control block is also equipped with an integrated type 1747-SDN DeviceNet scanner.

SLC5/02 processor technology and the 1747-SDN scanner technology licensed by Rockwell Automation provide computing and networking power, which is tailored to the requirements of a fully expanded valve terminal or CP system with networked system synchronisation.
The controller is programmed and configured using standard Allen Bradley software. The program is created using RSLogix500 and the DeviceNet configured using RSNetworx for DeviceNet. The online connection to the PC is established using the pre-assembled programming cable.

The control block SF60 is a highly compact solution; a stand-alone controller for CP valves and CP I/O modules connected via the CP system. The DeviceNet scanner can be used to network and synchronise stand-alone function units.

The mode of operation and functional scope of the control block SF60 is identical to that of the control block SB60. The SF60 also has an integrated DeviceNet scanner 1747-SDN. MIDI/MAXI/ISO valves can, like the electrical I/O modules from the range of electrical peripherals type 03/04, be expanded or combined.

General technical data		
Type		**CP-SF60-03-DN**
Part No.		**175 413**
Addressing range		0 ... 63
Product type		Communication converter (12 dec.)
Product code		SF60 scanner 1747-SDN (19 dec.)
Type of communication		■ Polled I/O ■ Change of state/cyclic ■ Strobed I/O ■ Explicit messaging
Data storage area for DeviceNet	Input data	32 bytes, plus M1 file
	Output data	32 bytes, plus M0 file
Mode of operation on DeviceNet		■ DeviceNet master ■ Intelligent DeviceNet slave with exchange of data with the master ■ Intelligent slave with assigned slave station on DeviceNet
Diagnostic indicators		LEDs and 7 segment display identical to those of 1747-SDN
Operating voltage pin 1	Nominal value	24 V DC polarity-safe
	Permissible range	18 ... 30 V
	Power failure buffering	20 ms
Current consumption pin 1	Control block	200 mA
	CP modules	560 mA (internal electronics) + total current consumption of inputs
Load voltage pin 2	Nominal value	24 V DC
	Valves	20.4 ... 26.4 V
Current consumption pin 2		Total of all valves switched simultaneously, see technical data on CP valves ➔ Info 213 and 214 Compact Performance valve terminals CPV and CPA
Protection class to EN 60 529		IP65
Temperature range	Operation	–5 ... +50 °C
	Storage	–20 ... +70 °C
Materials	Housing	Die-cast aluminium
	Cover	Polyamide
Dimensions[1] (LxWxD)		162 x 148.7 x 132 mm
Grid dimension		72 mm
Weight		1800 g

1) Dimensions consisting of control block, CP interface as well as left and right end plate

Network connection

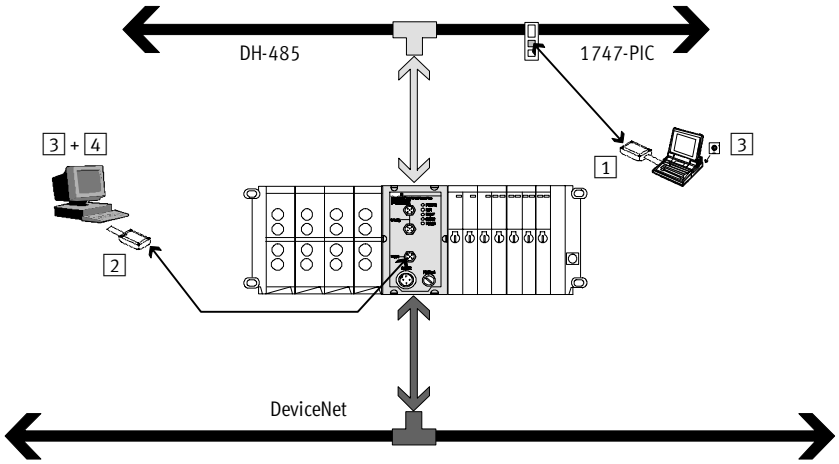
DeviceNet is a rapid communication medium that is required for interlocking logic in decentralised automation units and for stand-alone manufacturing cells, commissioned separately and coupled via DeviceNet.

The DeviceNet scanner facilitates the connection of supplementary devices from manufacturers that are needed to realise the full functional scope of the control program of the control block – a quick and easy way of expanding functions.

Through the integration of the DeviceNet scanner 1747-SDN, in addition to the controller capabilities of the SLC500, the control block offers the greatest possible degree of flexibility in terms of installation on the DeviceNet.

- Can be used as a master in a network with subordinate slave stations
- Can be used as an intelligent slave station, with execution synchronisation with a higher-order master
- Can be used as an intelligent slave station with its own assigned slave devices for the expansion of functions

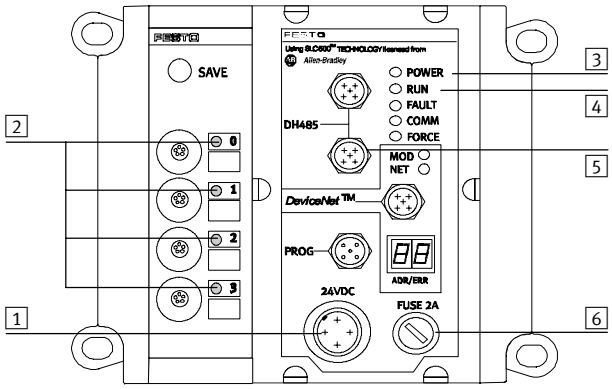
System overview – DeviceNet



1 Interface converter 1747-PIC
2 Communication adapter 1770-KFD or 1784-PCD
3 Programming software RSNetWorx or RSLogix500
4 DeviceNetManager software version 3.004 or above

Connection and display components

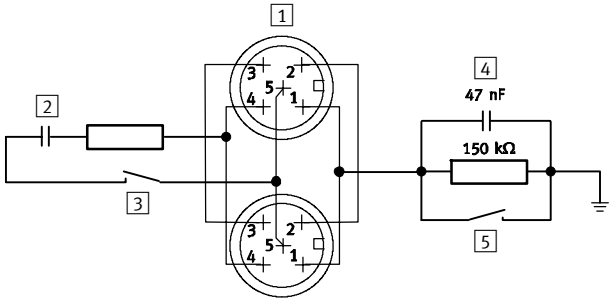
The following connection and display components can be found on the control block cover:



1 Operating voltage connection
2 String LEDs
3 Red LED / POWER
4 Green LED / RUN
5 Plug for DH-485
6 Fuse for operating voltage of inputs

DIP switch settings

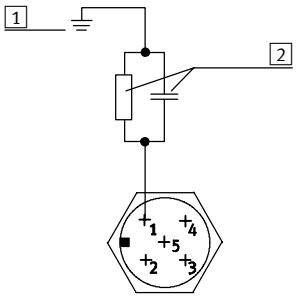
Positioning of the DIP switches for the bus terminal and earth on the DH-485



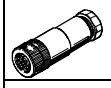
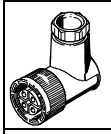
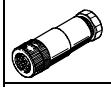
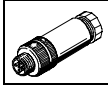
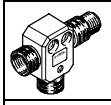
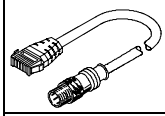
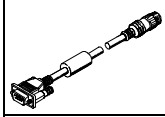
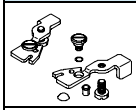
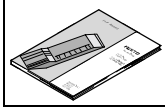
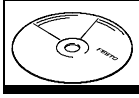
1 Connection of the DH-485 to the control block
2 DH-485 bus terminal
3 DIP switch 1
4 DH-485 earth
5 DIP switch 2

Pin allocation

Fieldbus interface



1 Screen/shield
2 Internal network

Ordering data				
Designation			Type	Part No.
Power supply				
	Power supply socket, straight	for 1.5 mm²	**NTSD-GD-9**	**18 493**
		for 2.5 mm²	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm²	**NTSD-WD-9**	**18 527**
		for 2.5 mm²	**NTSD-WD-11**	**533 119**
Fieldbus connection				
	Plug socket, straight, 5-pin		**FBSD-GD-9-5POL**	**18 324**
	Plug, straight, 5-pin for T-adapter		**FBS-M12-5GS-PG9**	**175 380**
	T-adapter for DH-485		**FB-TA-M12-5POL**	**171 175**
Diagnostic/data connection				
	Programming cable	3 m	**KDI-SB60-3,0-M12**	**171 173**
		6 m	**KDI-SB60-6,0-M12**	**175 686**
		10 m	**KDI-SB60-10,0-M12**	**171 174**
	Cable for DTAM Micro	3 m	**KDTAM-SB60-3-M12**	**188 979**
		6 m	**KDTAM-SB60-6-M12**	**188 980**
		10 m	**KDTAM-SB60-10-M12**	**188 981**
Mounting				
	Mounting for H-rail		**IBGH-03-4,0**	**18 649**
User documentation				
	User documentation – Control block CP-SF60-03-DN	German	**P.BE-VISB60-03-DE**	**184 572**
		English	**P.BE-VISB60-03-EN**	**184 573**
		Spanish	**P.BE-VISB60-03-ES**	**184 575**
Software				
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

FESTO

A powerful mini controller from Festo has been integrated in the ISF3-03 control block and built into a robust aluminium housing with the protection class IP65. This permits stand-alone control of up to 128 local inputs and outputs. A further 1048 inputs and outputs can be controlled via the integrated fieldbus.

Application

All plugs and electrical connections are designed for direct mounting on the machine outside of the control cabinet (provided that the requirements of IP65 are adhered to).
With the Festo fieldbus, additional I/Os and expanded functions can be installed and controlled. The control block SF3 can be operated as required in stand-alone mode, as a fieldbus slave or fieldbus master with up to 31 fieldbus slaves.

This controller is programmed via an RS232 programming interface using the software FST200. Alternatively, a display and control unit can be directly connected on-site.
The control block ISF3-03 is a highly compact solution; a stand-alone controller for CP valves and CP I/O modules connected via the CP system.

The elimination of internal wiring to the controller reduces the number of connection points required, thereby shortening the installation time and eliminating sources of potential errors.
The performance of the controller technology was selected and specially customised to meet the requirements of a valve terminal. Extensive diagnostic data provides information on the status of all components mounted on the valve terminal as well as the sensors and actuators connected to it.
MIDI/MAXI/ISO valves can, like the electrical I/O modules from the range of electrical peripherals type 03/04, be expanded or combined.

Operating modes

Stand-alone	Master	
Valve terminal with control block SF3 for controlling a stand-alone machine. Can be used to autonomously control small stand-alone machines or system components. Finally, it can be used to realise stand-alone subsystems with a discrete function as part of a larger system.	Control block SF3 with a fieldbus extension for controlling systems. The control block SF3 with integrated fieldbus interface facilitates the connection of local inputs and outputs as well as further fieldbus stations. It can also be used to process automation	tasks requiring a large number of electrical sensors and actuators. Finally, it can be used to realise stand-alone subsystems with a discrete function as part of a larger system.

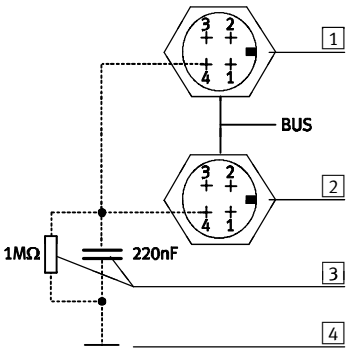
General technical data

Type			CP-SF3-03
Part No.			18 247
Programming device interface			4-pin round plug for PC/ABG/serial coupling (V24/RS232)
RAM and EEPROM program memory			128 kBytes for program, modules, text modules and drivers (4-20 Bytes = 1 instruction)
Processing time for 1024 binary instructions			approx. 1 ms
Flags			F0.0 to F31.15 = 512, all remanent
	No. of time flags		T0 to T31 = 32 (timer preselection remanent)
	Time range		0.01 s to 655.35 s
	No. of counting flags		Z0 to Z31, all remanent
	Counting range		0 to 65535
Register			R0 to R127, R0 to R99 remanent
Special FU			Function units 0 to 4096
Arithmetic functions			+, –, *, :
Inputs	Digital		128
	Analogue		36
Outputs	Digital		128
	Analogue		12
Programmable inputs/ outputs	CP		64 digital inputs/64 digital outputs incl. solenoid coils
	Fieldbus		1048 I/O (per station, max. 128 I and 128 O)
Permissible modules			Overview
	Programs		P 0 ... P 15 (user programs)
	Program modules		BAP 0 ... 15 (user programmable)
	Functional modules		BAF 0 ... 99
	BAF-Nr.	Application	
	0	Control block	Deletion of internal operands
	1		Location of short circuits
	2		Indirect set/reset of local outputs
	3		Indirect access to FU0 to FU4095
	4		Measurement of program runtime
	5		Reading of remanent data words
	6		Writing of remanent data words
	10		Assigning operation parameters/reading of counters/timers
	11		Interrupt-controlled enable/disable of counters/timers
	21	CP interface	Reading/writing of data CP auxiliary module
	23		Reset of all outputs accessible via CP
	25		Diagnosis of CP valve terminal, input and output modules
	27		Assigning operation parameters for CP errors
	28		Recording of CP configuration

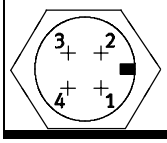
General technical data			
Type			**CP-SF3-03**
Part No.			**18 247**
	Functional modules		
	BAF-Nr.	Application	
	31	AS-interface master/AS-interface bus system	Reading of AS-interface slave parameters
	32		Writing of AS-interface slave parameters
	33		Reset of all outputs accessible via AS-interface bus
	35		Diagnosis of all AS-interface slaves
	37		Assigning operation parameters for control block for AS-interface errors
	38		Reconfiguration of the AS-interface bus
	40	Fieldbus	Requesting the fieldbus configuration
	41		Master/slave mode: Reading the parameters of a fieldbus station
	42		Master/slave mode: Writing the parameters of a fieldbus station
	43		Reset of all outputs accessible via fieldbus
	44		Fieldbus station status request
	47		Assigning operation parameters for fieldbus errors
	48		Recording of actual configuration
	49		Comparison of actual list with reference list
	50		Reading of fieldbus station information
	51		Fieldbus station reset
	60	Analogue modules	Loading of analogue values
	61		Output of analogue values
	63		Diagnosis of analogue module
	90	Control block	Execution of assembler programs (functional modules)
	91		
	92		
	93		
	94		
	95		
	96		
	97		
	98		
	99		
Programming software			FESTO FST 200
Communication	Point to point coupling		Yes
	Bus system		Festo fieldbus (master or slave), RS485
Diagnosis			Comprehensive diagnosis, evaluation using FST 200 or via inputs into user program

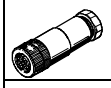
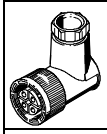
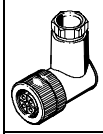
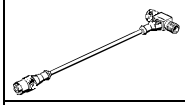
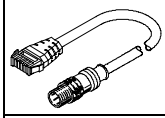
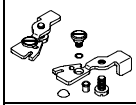
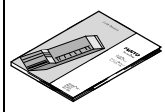
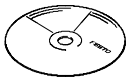
General technical data		
Type		**CP-SF3-03**
Part No.		**18 247**
Fieldbus interface		2x 4-pin round plug (RS485)
Protocol		Festo fieldbus
Cable length (dependent on baud rate)		Two wire cable, max. 500 ... 4000 m
Bus address SF master		Permanent (master/slave mode set via FST 200)
Bus address SF slave		Set via FST 200 (1 ... 31)
Bus terminal		Set via FST 200
Communication SF slave		Max. 12 byte inputs and 12 byte outputs
Bus station as master		Control block CP-SF3-03 1 master Max. 31 slaves: Festo valve terminals and digital modules
Bus station as slave Data exchange (cyclic) Data exchange (acyclic)		Control block CP-SF3-03 Max. 12 byte inputs and 12 byte outputs, via fieldbus I/O with Festo fieldbus master (e.g. SF3, FPC405, ...) Parameter field, max. 256 words
Parameter/configuration software for SF3 as master		Using a fieldbus configurator integrated in the FST 200
Diagnosis		Comprehensive diagnosis, evaluation using FST 200 or via inputs into user program
Operating voltage	Nominal value	24 V DC polarity-safe
	Permissible range	18 ... 30 V
	Power failure buffering	20 ms
Current consumption pin 1	Control block	200 mA
	CP modules	560 mA (internal electronics) + total current consumption of inputs
Current consumption pin 2		Total of all valves switched simultaneously, see technical data on CP valves ➔ Info 213 and 214 Compact Performance valve terminals CPV and CPA
Protection class to EN 60 529		IP65
Temperature range	Operation	–5 ... +50 °C
	Storage	–20 ... +70 °C
Material	Housing	Die-cast aluminium
	Cover	Polyamide
Dimensions (HxWxD)		162 x 118.7 x 132 mm
Weight		1550 g

Pin allocation for fieldbus interface

Pin allocation		Pin No.	Signal
	1 Plug 1	1	S+
		2	n.c.
		3	S–
		4	Screen/shield
	2 Plug 2	1	S+
		2	n.c.
		3	S–
		4	Screen/shield
	3 Internal network		
	4 Housing/node		

Pin allocation for diagnostic interface

Pin allocation	Pin No.	Signal
	1	RxD
	2	TxD
	3	GND
	4	Screen

Ordering data				
Designation			Type	Part No.
Power supply				
	Power supply socket, straight	for 1.5 mm²	**NTSD-GD-9**	**18 493**
		for 2.5 mm²	**NTSD-GD-13,5**	**18 526**
	Power supply socket, angled	for 1.5 mm²	**NTSD-WD-9**	**18 527**
		for 2.5 mm²	**NTSD-WD-11**	**533 119**
Fieldbus connection				
	Bus connection, straight	PG7	**FBSD-GD-7**	**18 497**
		PG9	**FBSD-GD-9**	**18 495**
		PG13.5	**FBSD-GD-13,5**	**18 496**
	Bus connection, angled	PG7	**FBSD-WD-7**	**18 524**
		PG9	**FBSD-WD-9**	**18 525**
	T-adapter for fieldbus		**FB-TA**	**18 498**
Diagnostic/data connection				
	Programming cable		**KDI-SB202-BU9**	**150 268**
			KDI-SB202-BU25	**30 437**
Mounting				
	Mounting for H-rail		**IBGH-03-4,0**	**18 649**
User documentation				
	User documentation – Control block ISF3-03	German	**P.BE-VISF3-03-DE**	**165 481**
		English	**P.BE-VISF3-03-EN**	**165 486**
		French	**P.BE-VISF3-03-FR**	**165 491**
		Italian	**P.BE-VISF3-03-IT**	**165 446**
		Spanish	**P.BE-VISF3-03-ES**	**165 496**
Software				
	Programming software FST200 with manual for SF3	German	**P.BE-FST200-AWL/KOP-DE**	**165 484**
		English	**P.BE-FST200-AWL/KOP-EN**	**165 489**
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

CP installation system

Technical data – Electrical interface for CP interface

Function

The electrical interface, CP interface, establishes the connection to a CP system. I/O data from the CP system is transferred to the connected bus node, and then to the higher-order controller via the fieldbus.
As well as transmitting the communication data, the max. 4 CP strings also transmit the supply voltage to the connected sensors and the load supply to the valves. The two circuits are isolated and are supplied with power by the connected bus node or control block.

Applications

The following bus nodes/control blocks support the CP interface electrical interface.

Bus nodes:
- IFB8-03 1771 Remote I/O

The CP interface electrical interface occupies one bus node exclusively. Additional local valves or further electrical I/O modules cannot be connected.

Control blocks:
- ISF3-03 Festo machine controller
- ISB60-03, ISF60-03-DN SLC 500 controller from Allen Bradley

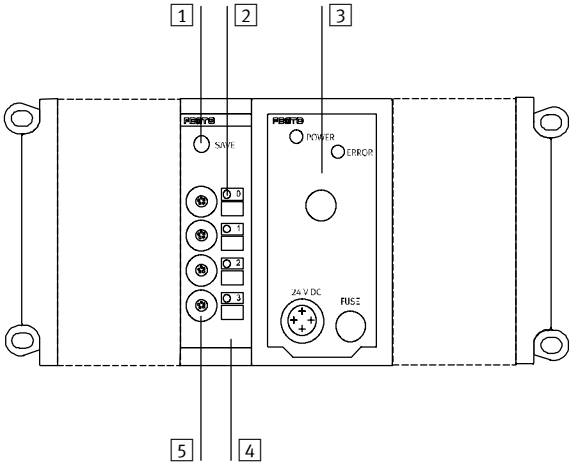
Further local valves or electrical I/Os can be connected.

General technical data			
Type			**VIGCP-03-FB**
Part No.			**18 229**
Brief description			CP interface
Max. no. of CP modules per string			1 output module or valve terminal and 1 input module
Number	CP strings		4
	Outputs		64
	Inputs		64
	Occupied module positions		1
Supply voltage of sensors		[V]	24 DC ±25% coming from bus node
Load voltage of the actuators		[V]	24 DC ±10% coming from bus node
Cycle time		[ms]	< 5 at full expansion
Current consumption		[mA]	90
Protection class to EN 60 529			IP65 (when fully plugged-in or fitted with protective cover)
Temperature range	Operation	[°C]	+5 ... +50
	Storage	[°C]	–20 ... +70
Material			Die-cast aluminium
Dimensions (HxWxD)		[mm]	132 x 36 x 53
Grid dimension		[mm]	36
Weight		[g]	310

CP installation system

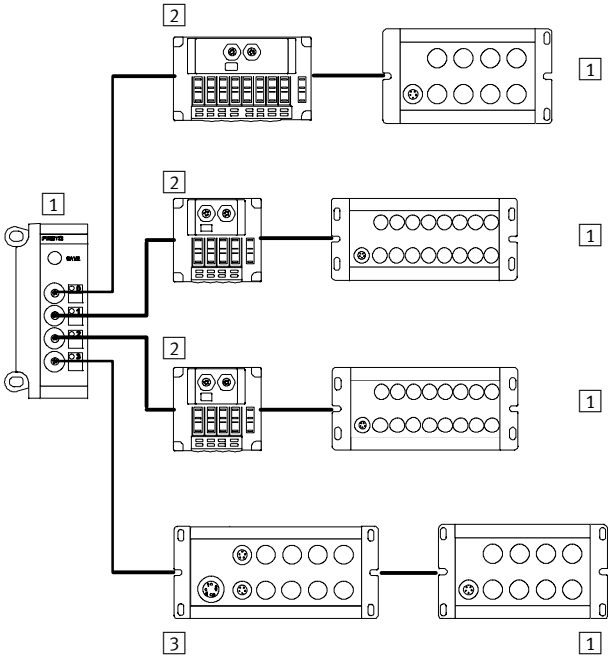
Technical data – Electrical interface for CP interface

Connection and display components



1 SAVE key
2 String error LEDs
3 Control block ISF3-03
4 Inscription areas
5 CP connections for up to 4 strings (0 ... 3)

Example of circuit



1 CP input module
2 Valve terminals type 10 CPV and type 12 CPA, Compact Performance
3 CP output module

You will find further information
➔ under Info 213 Compact Performance CPV
➔ under Info 214 Compact Performance CPA
➔ under Info 221 CP installation system

CP 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

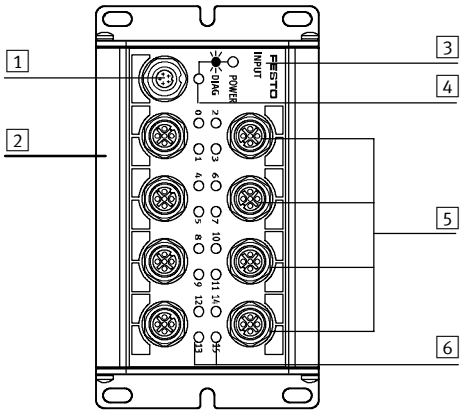
- Input modules for 24 V DC sensor signals
- M8 and M12 plugs, single allocation connection technology with 16 connections, double allocation connection technology with 8 connections
- M12 plug, 5-pin
- The input statuses are indicated for each input signal on an assigned LED
- 24 V DC supply provided 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						
Type Part No.			**CP-E16-M8 positive switching 18 205**	**CP-E16N-M8 negative switching 18 243**	**CP-E16-M12x2-5POL positive switching 175 561**	
No. of inputs			16			
Allocation of inputs			Single allocation		Double allocation	
Sensor connection type			16x M8, 3-pin		8x M12, 5-pin	
Power supply 24 V DC			Coming from bus node			
Intrinsic current consumption, 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 60 529			IP65 (when fully plugged-in or fitted with protective cover)			
Temperature range	Operation	[°C]	–5 ... +50			
	Storage	[°C]	–20 ... +70			
Material			Die-cast aluminium			
Dimensions		[mm]	148.9 x 66 x 47.9		140.9 x 78 x 55.2	
Weight		[g]	400		500	

General technical data							
Type			CP-E16N-M12x2 negative switching	CP-E16-M8-Z positive and negative switching		CP-E16-KL-IP20-Z positive and negative switching	
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 60 529			IP65 (when fully plugged-in or fitted with protective cover)				
Temperature range	Operation	[°C]	–5 ... +50				
	Storage	[°C]	–20 ... +70				
Material			Die-cast aluminium				
Dimensions		[mm]	140.9 x 78 x 55.2	216.9 x 66 x 50.6		175 x 66 x 53.2	
Weight		[g]	500	420		320	

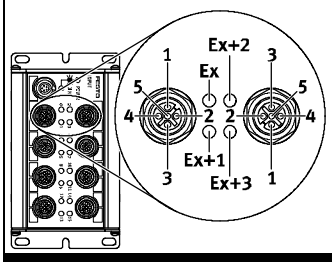
Connection and display components

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

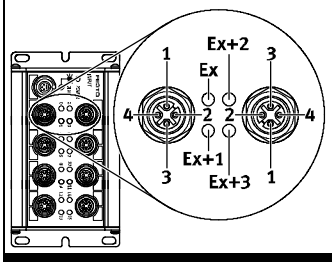


1 CP connection
2 Slot for inscription labels (ISB 6x10)
3 Identification of input type:
-INPUT-P for PNP inputs
-INPUT-N for NPN inputs
4 Status LED (green)
5 Sensor connections
6 Green LED for status display (one LED per input)

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

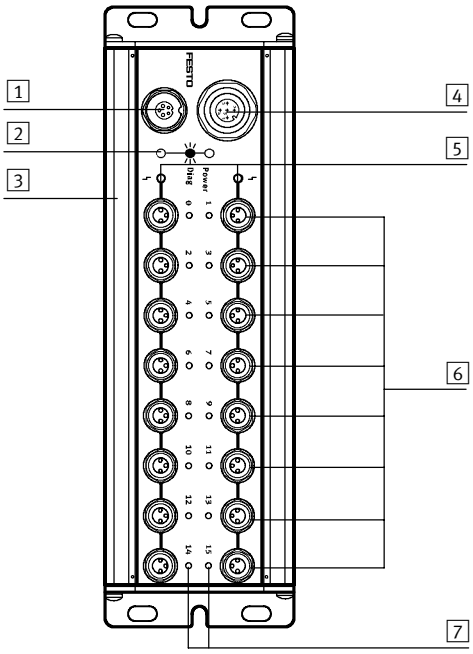
Pin allocation for sensor connections CP-E16...-M12x2

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

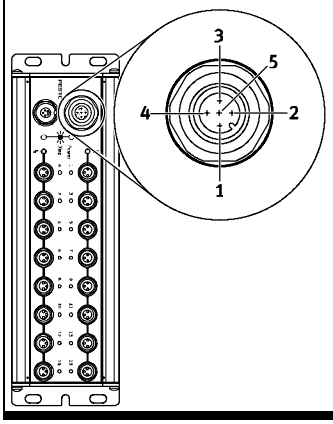
Connection and display components

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)

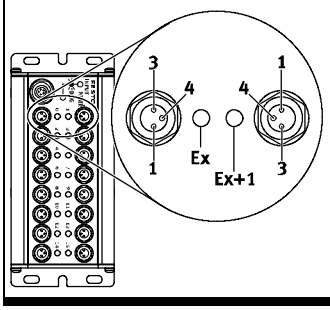
Pin allocation for external sensor supply CP-E16-M8-Z

Pin allocation	Pin	Signal	Designation
	1	24 V DC ±25%	Operating voltage
	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

- Note

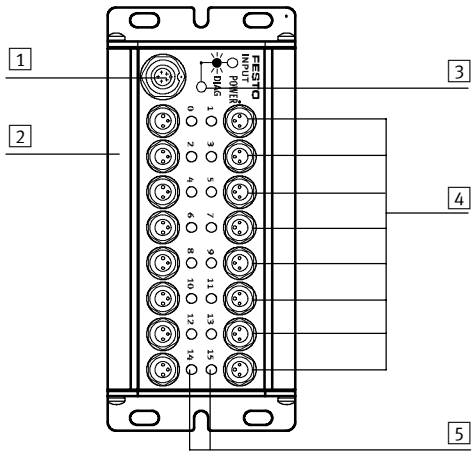
External sensor supply for CP-E16-M8-Z:
Specified for PNP or NPN operation (type CP-E16-M8-Z).
The input module provides PNP or NPN inputs. The setting for PNP or NPN operation is made by installing a bridge in the socket of the sensor supply connection.

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

Pin allocation	Pin	Signal	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*

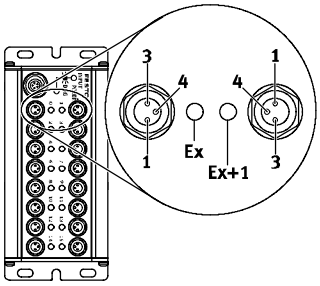
* Ix = Input x

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)

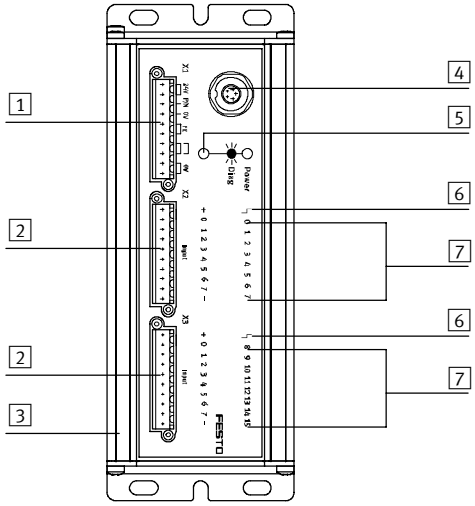
Pin allocation for sensor connections CP-E16...-M8 and CP-E16-M8-Z

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

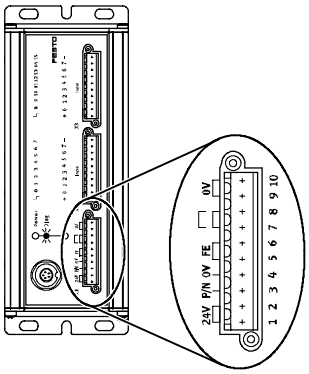
Connection and display components

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

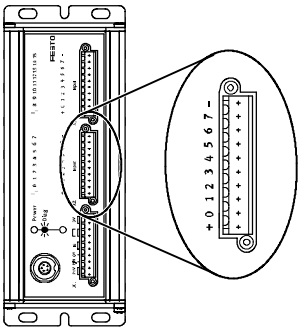
Pin allocation	Pin	Signal	Designation
	1	24 V DC ±25%	Operating voltage 24 V
	2	24 V DC ±25%	Bridged with 1
	3	PNP/NPN	Coding with negative/positive switching: – PNP operation (pin 3 and 4 bridged) – NPN operation (pin 3 and 2 bridged)
	4	0 V	Operating voltage 0 V
	5	FE	Functional earthing
	6	FE	Functional 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	

Note

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.

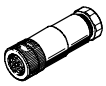
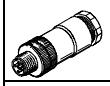
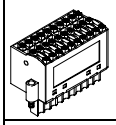
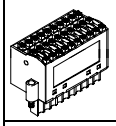
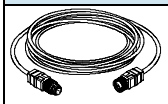
* A separate load supply for the valves/outputs can be looped through via pin 7 and 8. The relevant potential can be passed on to the next module via the other internal bridges (24 V, FE, 0 V).

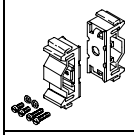
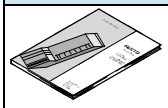
Pin allocation for sensor supply CP-E16-KL-IP20-Z

Pin allocation	Pin	Signal	Designation	Pin	Signal
	Plug X2			Plug X3	
	+	24 V DC	Operating voltage	+	24 V DC
	0	I 0	Connections for sensors	0	I 8
	1	I 1		1	I 9
	2	I 2		2	I 10
	3	I 3		3	I 11
	4	I 4		4	I 12
	5	I 5		5	I 13
	6	I 6		6	I 14
	7	I 7		7	I 15
	–	0 V DC		-	0 V DC

Note

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.

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 mm² 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**

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**
Software				
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

CP 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

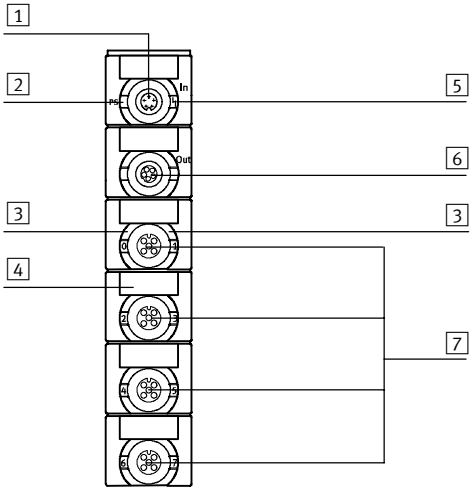
- Input modules for 24 V DC sensor signals
- M8 and M12 plug connection technology
- M12 input module, inputs with double allocation. M8, inputs with single allocation.
- M12 plug, 5-pin
- The input statuses are indicated for each input signal on an assigned LED
- 24 V DC supply provided for all connected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

General technical data					
Type Part No.			**CP-E08-M12-CL positive switching 538 787**	**CP-E08-M8-CL positive switching 538 788**	**CP-E16-KL-CL positive switching 538 789**
No. of inputs			8		16
Allocation of inputs			Double allocation	Single allocation	
Sensor connection type			4x M12, 5-pin	8x M8, 3-pin	Spring-loaded terminals or screw terminals
Power supply 24 V DC			From the bus node, basic unit, CP interface, etc.		
Intrinsic current consumption, 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					
Type Part No.			**CP-E08-M12-CL positive switching 538 787**	**CP-E08-M8-CL positive switching 538 788**	**CP-E16-KL-CL positive switching 538 789**
Protection class to EN 60 529			IP65/IP67 (when fully plugged-in or fitted with protective cover)		IP20
Temperature range	Operation	[°C]	–5 ... +50		
	Storage	[°C]	–20 ... +70		
Material			Polybuteneterephthalate		
Dimensions WxLxH		[mm]	151 x 30 x 25		
Weight		[g]	165	190	145

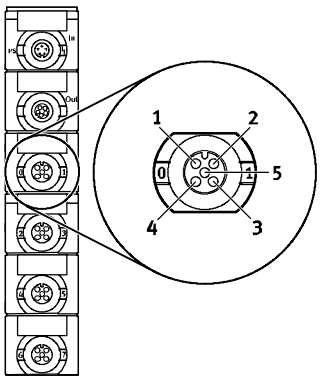
Connection and display components

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

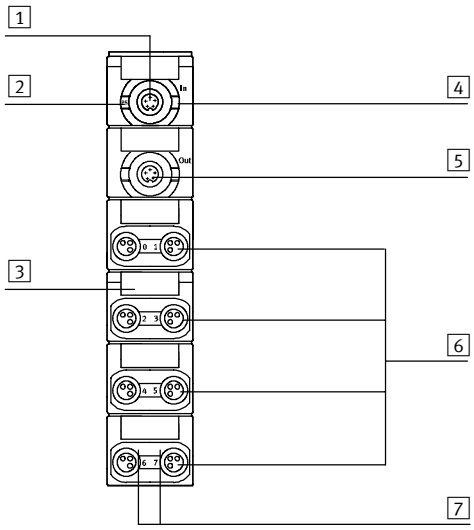
Pin allocation for sensor connections CP-E08-M12-CL

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

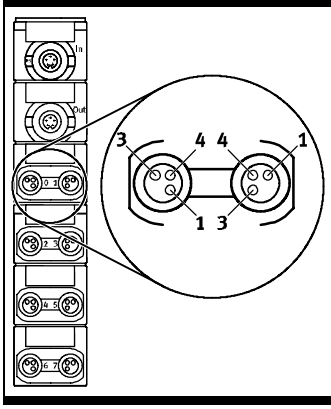
Connection and display components

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)

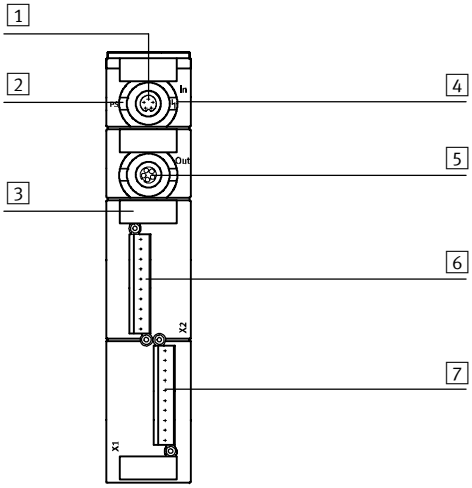
Pin allocation for sensor connections CP-E08-M8-CL

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

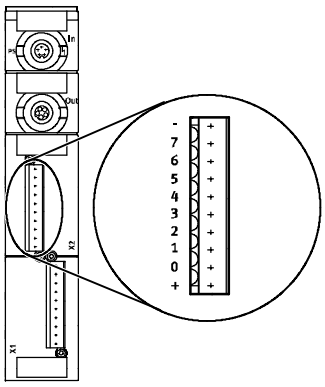
Connection and display components

CP-E16-KL-CL

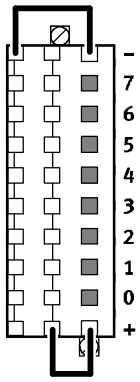


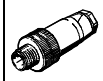
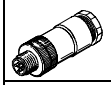
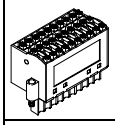
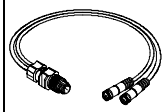
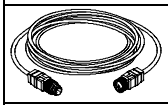
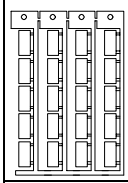
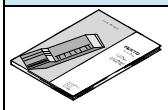
1 CP connection, incoming
2 Status LED (green)
3 Holder for inscription label (ISB 8x20)
4 Red LED for short circuit/overload indication
5 CP connection, outgoing
6 Sensor connections, plug X2
7 Sensor connections, plug X1

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

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

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

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**
Software				
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

CP installation system

Technical data – Output modules CP-A08

Function

The electrical outputs are used to activate actuators, individual valves, lamps, signal equipment and many more.

- Note

Optimum activation of valves with M12 central plug.

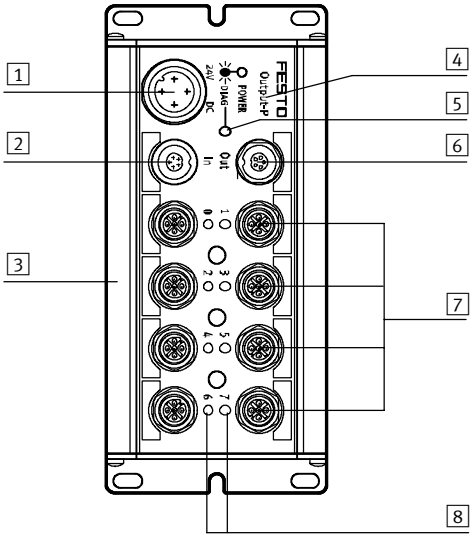
Applications

- Output module with 8 outputs 24 V DC
- M12 connection technology, with 4- or 5-pin sockets
- LED display of the switching status per channel
- Short circuit and overload detection
- Malfunction display by means of green LED

General technical data				
Type			CP-A08-M12-5POL positive switching	CP-A08N-M12 negative switching
Part No.			175 640	18 234
No. of outputs			8	
Allocation of outputs			Single allocation	
Output connection type			8x M12, 5-pin	8x M12, 4-pin
Load voltage connection			M18, 4-pin	
Bus connection			2 plugs M9, 5-pin, via prefabricated cables	
Max. output current per channel		[A]	0.5	
Operating voltage		[V]	24 DC ±25%	
Load voltage connection		[V]	24 DC ±25%, protected against incorrect polarity	
Fuse protection for power output		[A]	Electronic fuse per output 0.5	
Intrinsic current consumption, electronics		[mA]	Max. 90	
Overload/short circuit protection			Per channel	
Switching logic			PNP to IEC 1131-2	NPN to IEC 1131-2
Protection class to EN 60 529			IP65 (when fully plugged-in or fitted with protective cover)	
Temperature range	Operation	[°C]	–5 ... +50	
	Storage	[°C]	–20 ... +70	
Material			Die-cast aluminium	
Dimensions (LxWxD)		[mm]	172.9 x 78 x 57.1	
Weight		[g]	500	

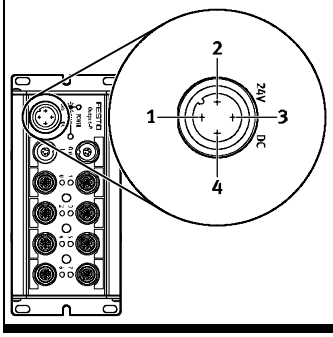
Connection and display components

CP-A08-M12...

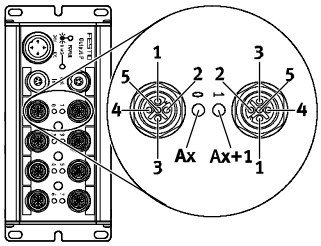
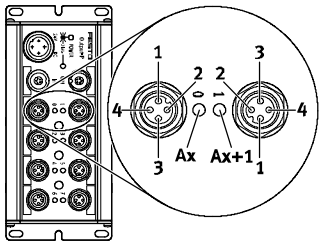


1 Load voltage connection
2 CP connection, incoming
3 Slot for inscription labels (ISB 6x10)
4 Identifier for output type:
– OUTPUT-P for PNP outputs
– OUTPUT-N for NPN outputs
5 Status LED (green)
6 CP connection, outgoing
7 Connections for actuators
8 Yellow LED for status display (one LED per output)

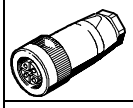
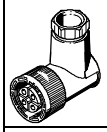
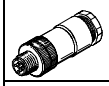
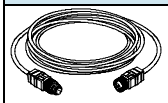
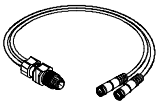
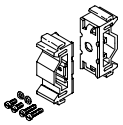
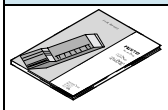
Pin allocation for load voltage connection CP-A08-M12...

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

Pin allocation for outputs

Pin allocation	Pin	Signal	Designation	Pin	Signal	
CP-A08-M12-5POL (PNP outputs)						
	1	n.c.	Not connected	1	n.c.	- Note Two outputs can be connected to output sockets 0, 2, 4 and 6 of the CP output module by means of internal connection between pin 2 of the even output and pin 4 of the opposite odd output.
	2	Ox+1	Connected with pin 4 of plug 2/Not connected	2	n.c.	
	3	0 V	Reference potential	3	0 V	
	4	Ox	Output/Connected with pin 2 of plug 1	4	Ox+1	
	5	Load	Earth terminal	5	Load	
CP-A08-M12 (NPN outputs)						
	1	24 V DC	Operating voltage	1	24 V DC	- Note The consuming devices/load must be supplied with a 24 V operating voltage via pin 1.
	2	FE	Earth terminal	2	FE	
	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**
Sensor cables				
	Connecting cable, M12, 4-pin, straight plug-straight socket	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
	Connecting cable, M12, 4-pin, straight plug-angled socket	1.0 m	**KM12 M12-GSWD-1-4**	**185 499**
	DUO cable M12	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**
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**
Software				
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

CP installation system

Technical data – Output modules CP-A04

Function

The electrical outputs are used to activate actuators, individual valves, lamps, signal equipment and many more.

Note

Optimum control for valves with M12 central plug.

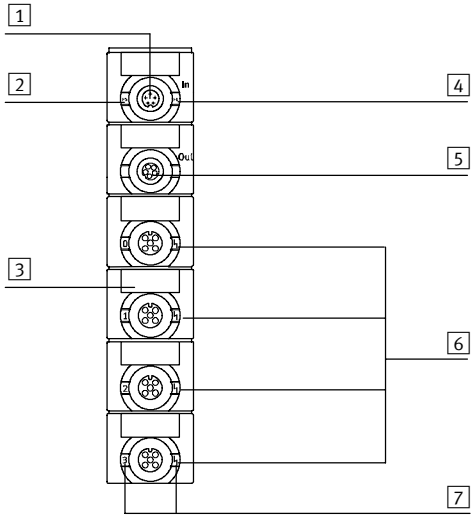
Applications

- 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 extended CP 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 60 529			IP65/IP67 (when fully plugged-in or fitted with protective cover)
Temperature range	Operation	[°C]	–5 ... +50
	Storage	[°C]	–20 ... +70
Material			Polybuteneterephthalate
Dimensions (LxWxD)		[mm]	151 x 30 x 30
Weight		[g]	165

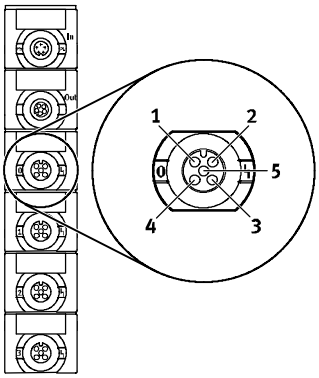
Connection and display components

CP-A04-M12-CL



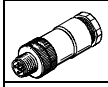
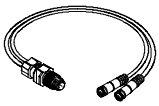
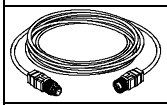
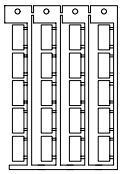
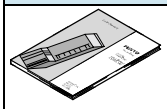
1 CP connection, incoming
2 Status LED (green)
3 Holder for inscription label (ISB 8x20)
4 Red LED for short circuit/overload indication
5 CP connection, outgoing
6 Output
7 Green LED for status display (one LED per output)

Pin allocation for outputs

Pin 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 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 output and pin 4 of the underlying even output.
	2	Ox+1	Connected with pin 4 of plug 2/Not connected	2	n.c.	
	3	0 V	Reference potential	3	0 V	
	4	Ox	Output/Connected with pin 2 of plug 1	4	Ox+1	
	5	FE	Earth terminal	5	FE	

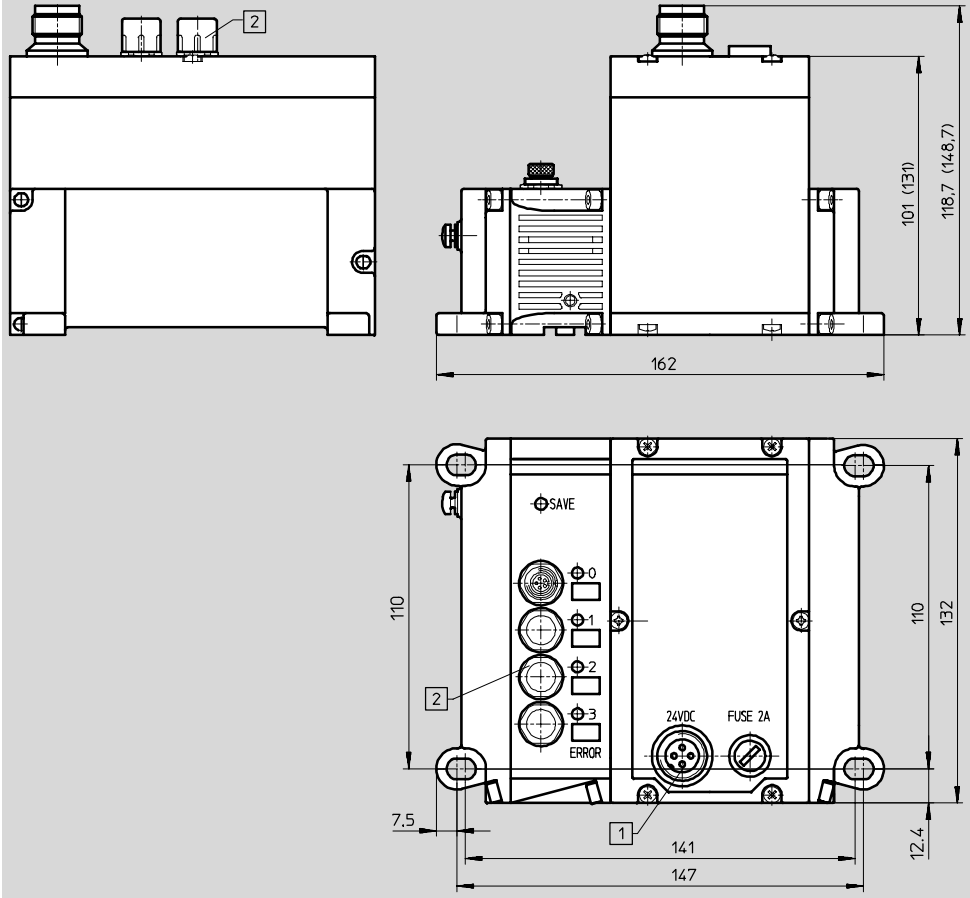
* Ox = Output x

Ordering data

Designation			Type	Part No.
Sensor plugs				
	Plug, straight socket, M12	5-pin, PG7	**SEA-M12-5GS-PG7**	**175 487**
		4-pin, PG7	**SEA-GS-7**	**18 666**
		4-pin, 2.5 mm^2 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**
Software				
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

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

Fieldbus node/control block



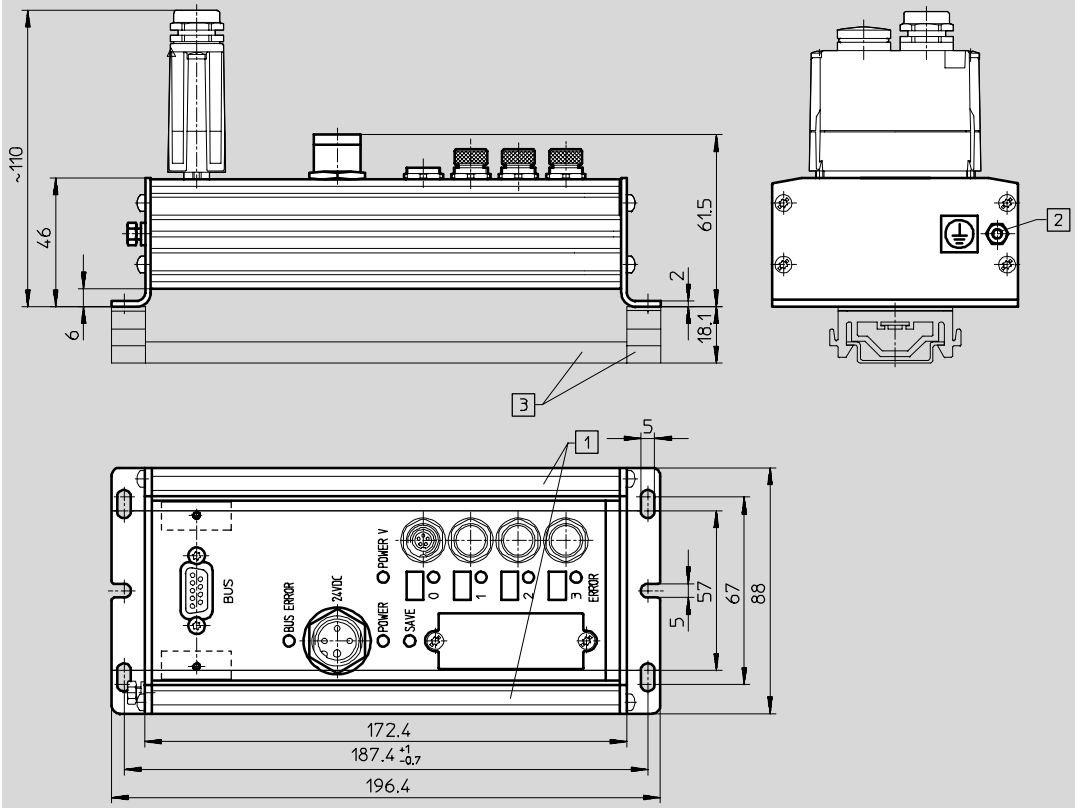
1 Mains connection
2 Protective cap (included in scope of delivery)

Note

The dimensions are valid for:
- Fieldbus node CP-FB08-03
- Integrated Festo controller CP-SF3-03
- Integrated Allen Bradley controller CP-SB/SF60-03 (dimensions in brackets)

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

Fieldbus node



1 Inscription label slots
2 Earthing screw
3 H-rail with support base

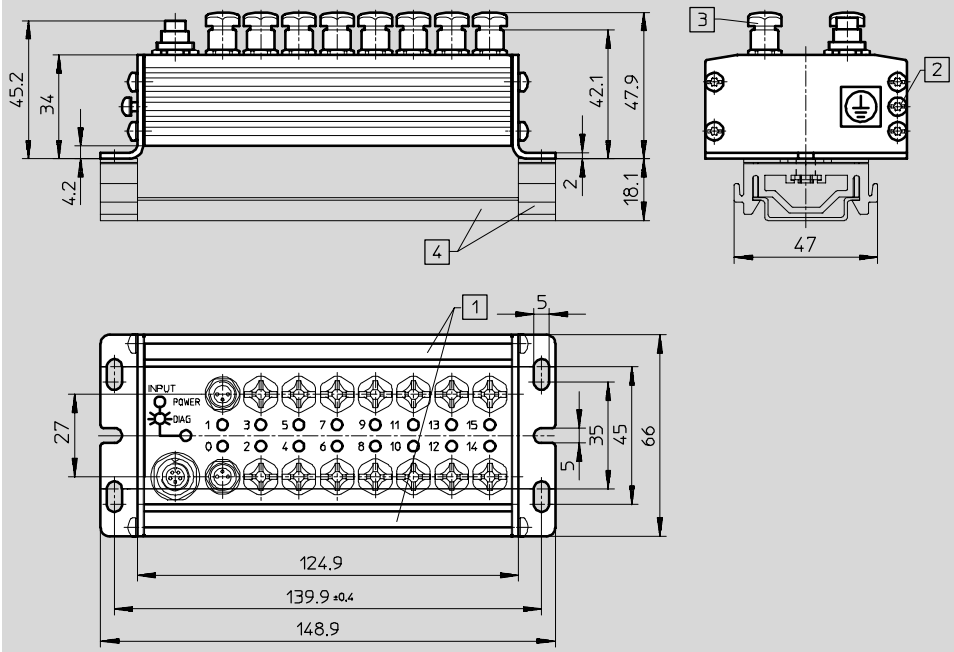
- Note

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

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

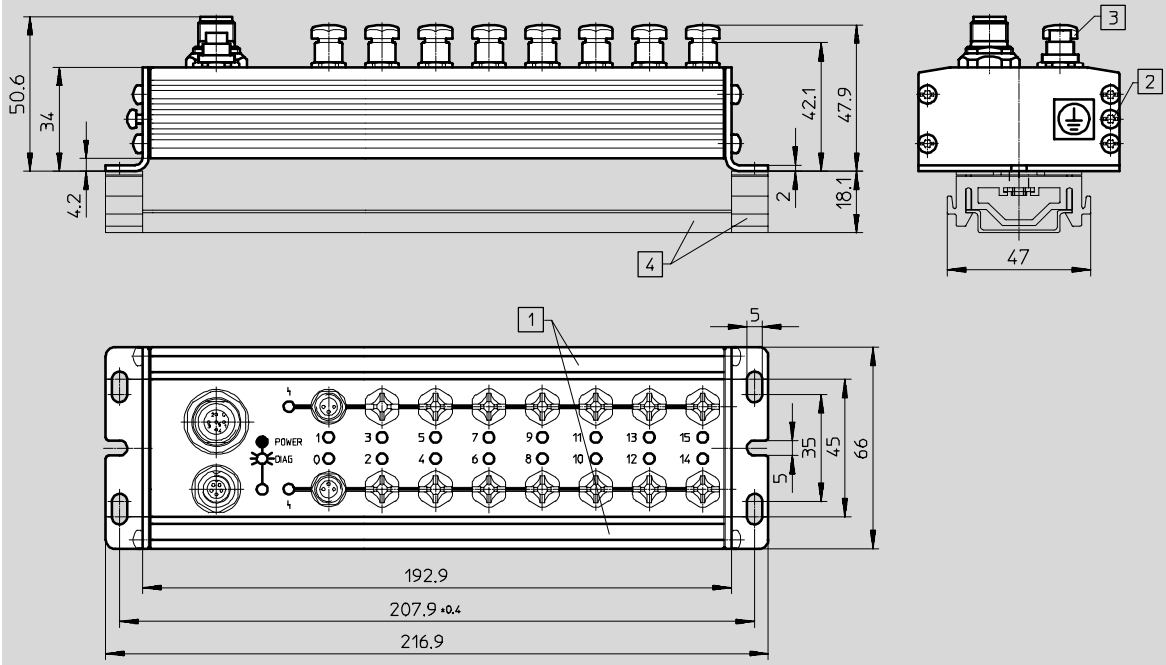
Dimensions – 16-fold input modules Download CAD data ➔ **www.festo.com/en/engineering**

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

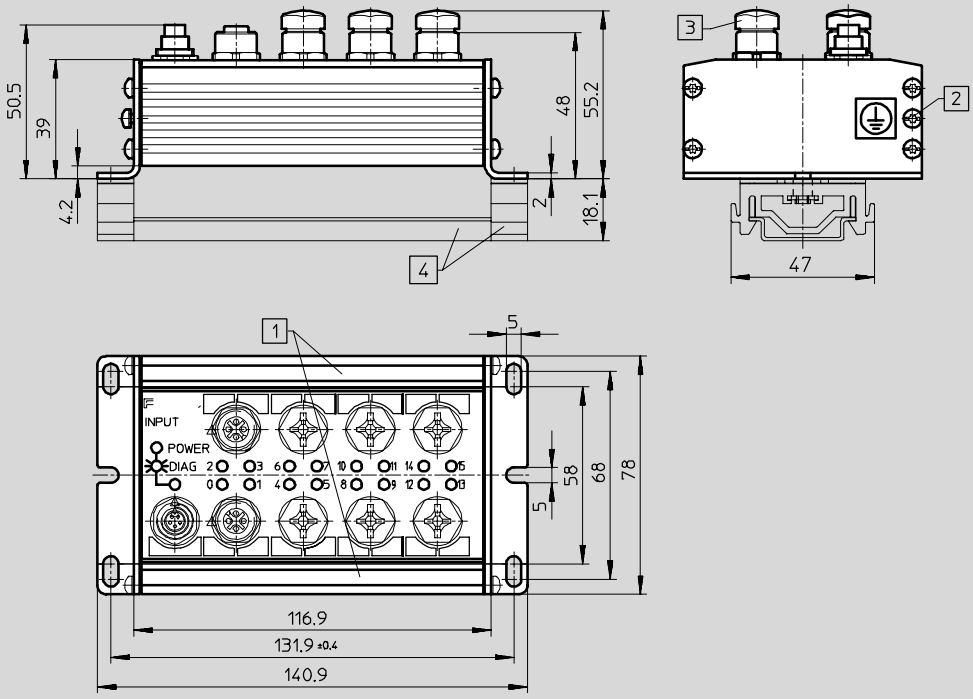
CP-E16-M8-Z



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

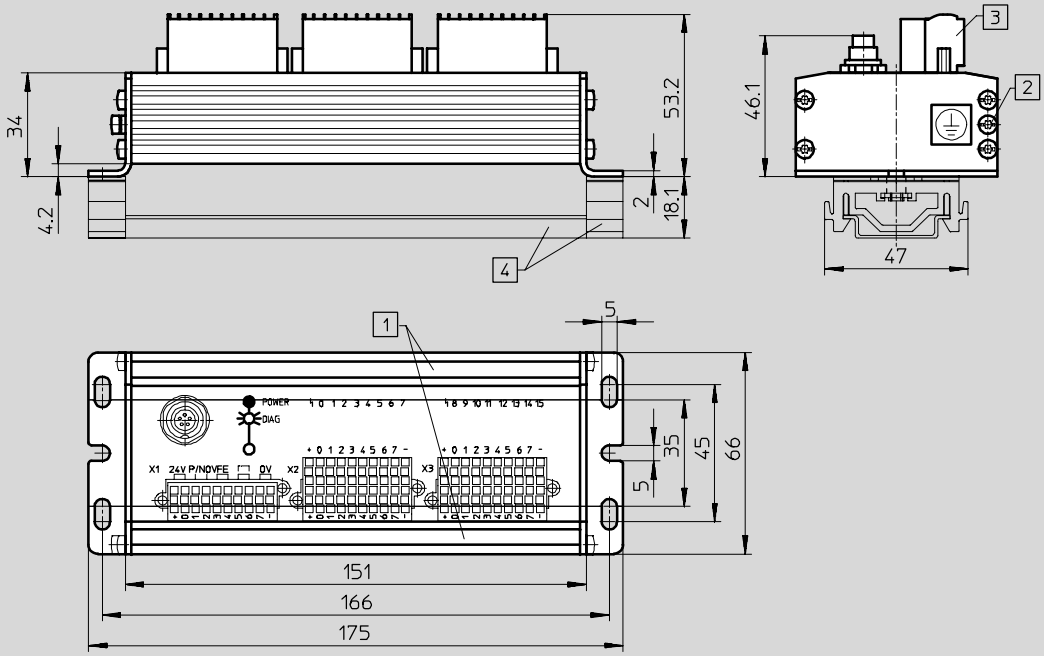
Dimensions – 16-fold input modules Download CAD data ➔ **www.festo.com/en/engineering**

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

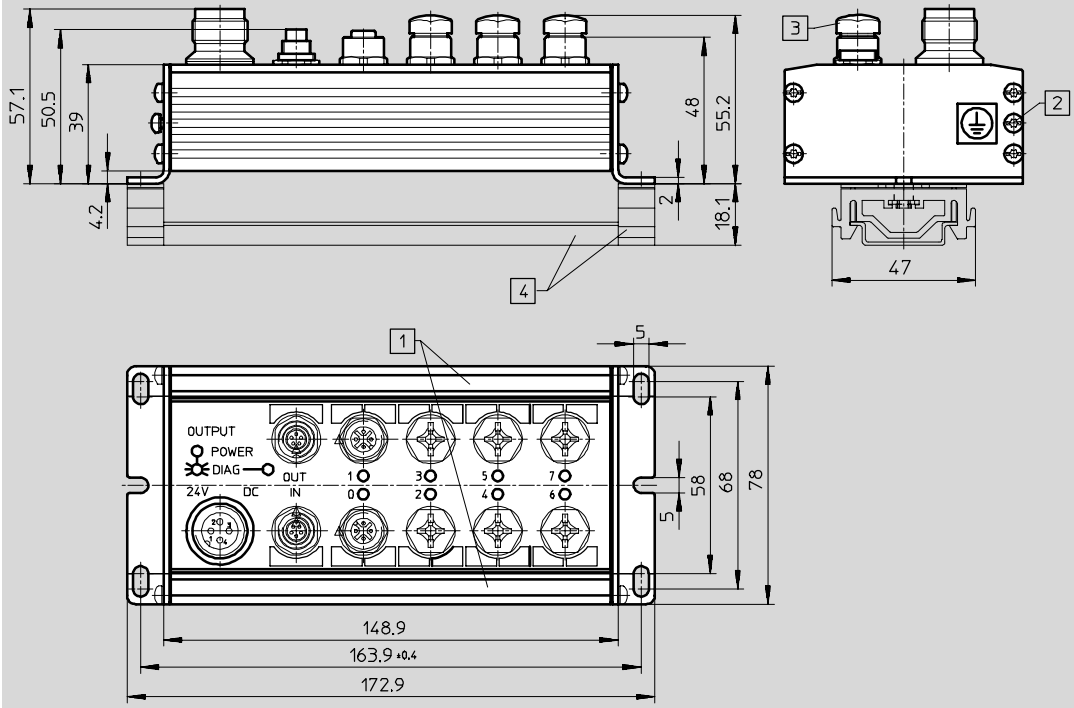
CP-E16-KL-IP20-Z



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

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

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



1 Inscription label slots

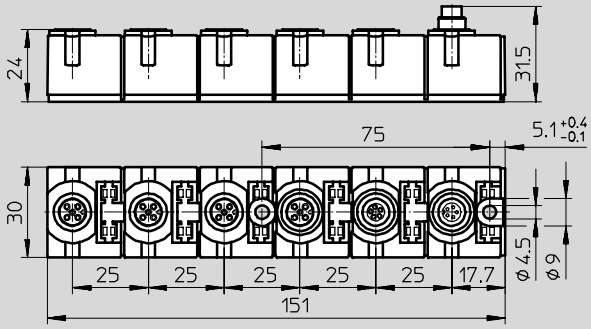
2 Earthing screw M3

3 Protective cap (included in scope of delivery)

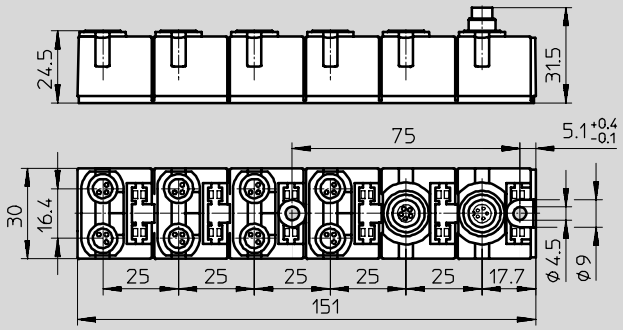
4 H-rail with support base

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

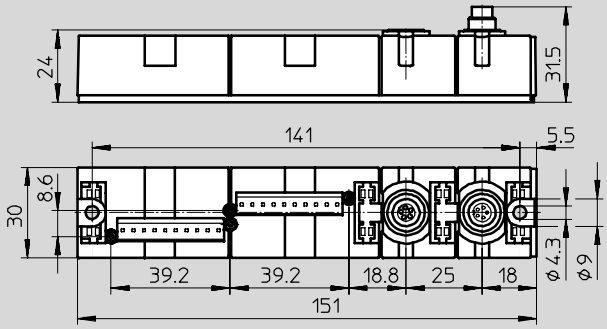
CP-E08-M12-CL/CP-A04-M12-CL



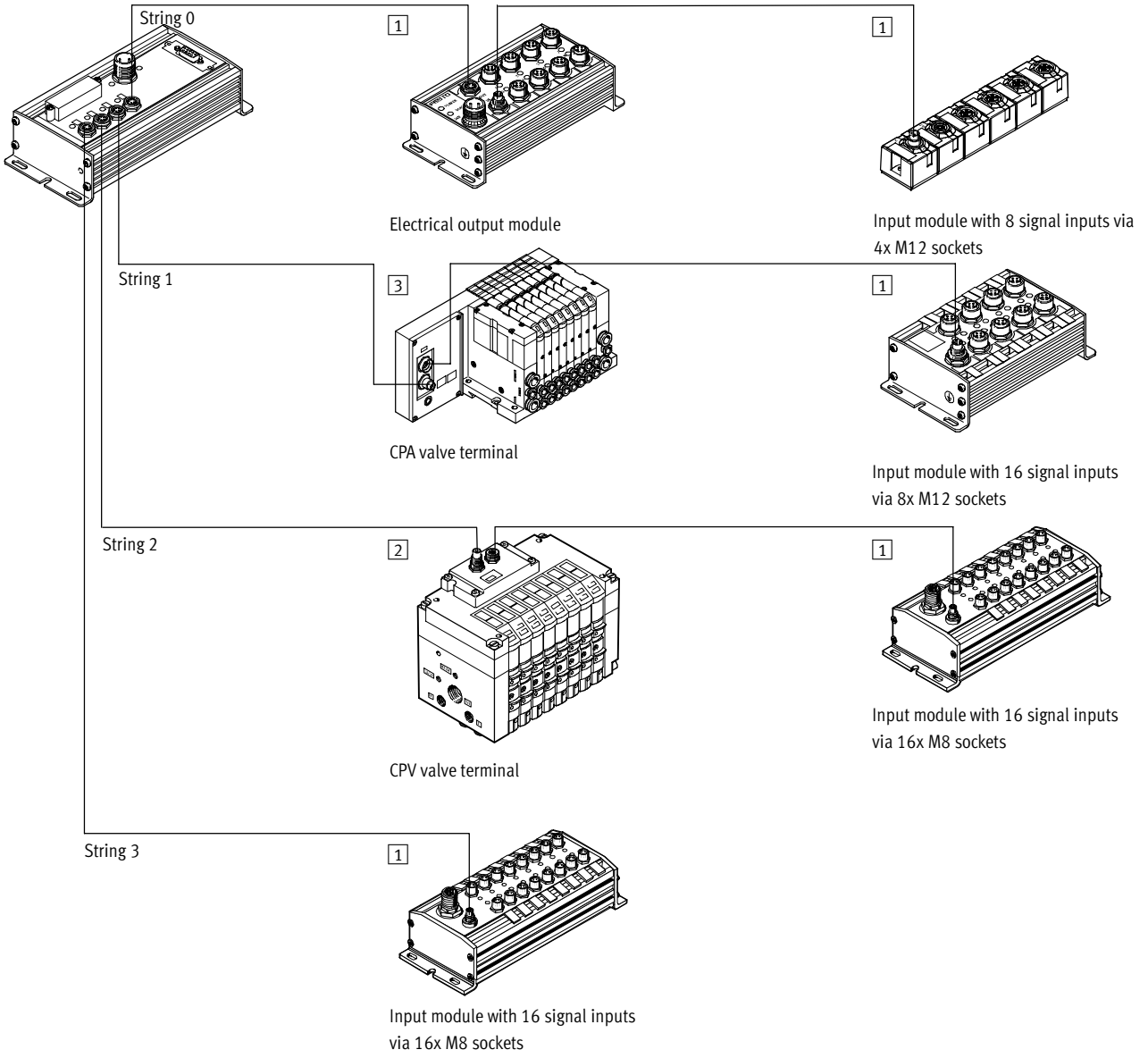
CP-E08-M8-CL



CP-E16-KL-CL



Fieldbus node/control block



The CP installation system is ordered via the catalogue using various order forms or with the valve terminal configurator using various module configurations.

1 The electrical CP modules, the CP cable and the required accessories are ordered via the ordering procedure for the CP installation system
➔ 83.
The CPV and CPA valve terminals are entered as placeholders on these pages; these modules are configured separately.

2 CPV valve terminals for operation within the CP installation system, CPV10/18-VI-FB-....
These are ordered via the ordering procedure for the CPV valve terminal
➔ Info 213

3 CPA valve terminals for operation within the CP installation system, CPA10/14-IFB-CP....
These are ordered via the ordering procedure for the CPA valve terminal
➔ Info 214
.

Configuration guidelines

- Up to 64 inputs and 64 outputs can be connected to each node in up to 4 strings.
- Up to 16 inputs and 16 outputs can be included in each string.
- Each string may include one module with outputs (electrical or pneumatic) and one module with inputs.
- Ascending consecutive numbers should be assigned to the strings, i.e. starting with string 0, followed by string 1 ... etc. without omitting any numbers.
- Valve terminals and output modules have one plug each for valve terminal input connection and valve terminal output connection.
- Input modules have only one plug for valve terminal input connection.
- Starting at the node, a valve terminal (or an output module) is connected first, followed by an input module.
- An input module can also be connected directly to the node. However, only the input module can be included in the string in this case.
- The modules are connected to one another and to the fieldbus node with prefabricated cables.
- Cable length for any given string may not exceed 10 m.
- Cables are available with lengths of 0.5 m, 2 m, 5 m and 8 m ➔ 84

M Mandatory data ➔

Module No.	CP electrical components		Fieldbus node/control block
18 270	ECP		D1, FB5, FB6, FB8, F11, F13, SF3, SB6, SF6
Ordering example			
18 270	**ECP**	–	**F13**
1	**2**		**3**

Ordering table

				Conditions	Code		Enter code
M	**1**	Module No.	**18 270**				
	2	CP electrical components	Electrical installation system for type 10/12, CPA/CPV		**ECP**		ECP
	3	Fieldbus node and control block	Direct Link place holder	1	**-D1**		
			Fieldbus node for Festo fieldbus, ABB (CS31), Klöckner Moeller, Suconet K		**-FB5**		
			Fieldbus node for Interbus		**-FB6**		
			Fieldbus node for Allen Bradley/1771 RIO		**-FB8**		
			Fieldbus node for DeviceNet		**-F11**		
			Fieldbus node for PROFIBUS DP		**-F13**		
			Control block SF3 with Festo fieldbus		**-SF3**		
			Control block SB60		**-SB6**		
			Control block SF60 DeviceNet		**-SF6**		

1 **D1** Only 1 string may be occupied.

M Mandatory data	O Options	➔

String 1	String 2	String 3	String 4

4 First connecting cable: Q, R, S, K, L, U, V, W
5 Input module, output module: E, M, I, GE, F, J, GF, GN, A, C, N, GA, P
6 Second connecting cable: Q, R, S, K, L, U, V, W
7 Input module: E, M, I, GE, F, J, GF, GN, N

–	Q I	, K E	, L A	,
	4 + 5 + 6 + 7			

Ordering table

Module No.			18 270	Conditions	Code		Enter code
↓		String 1 ... 4		2	-		-
M	4	First connecting cable	Terminal connection cable WS-WD, 0.5 m	3	Q		
			Terminal connection cable WS-WD, 2 m	3	R		
			Terminal connection cable WS-WD, 5 m	3	S		
			Terminal connection cable GS-WD, 5 m	3	K		
			Terminal connection cable GS-WD, 8 m	3	L		
			Terminal connection cable GS-GD, 2 m, for chain link trunking	3	U		
			Terminal connection cable GS-GD, 5 m, for chain link trunking	3	V		
			Terminal connection cable GS-GD, 8 m, for chain link trunking	3	W		
	5	Input module, output module	16-fold input module, 16xM8 PNP		E		
			16-fold input module, 16xM8 PNP Z		M		
			16-fold input module, 16xM8 NPN		I		
			8-fold input module, 8xM8 PNP, 3-pin		GE		
			16-fold input module, 8xM12 PNP, 5-pin		F		
			16-fold input module, 8xM12 NPN		J		
			8-fold input module, 4xM12 PNP, 5-pin		GF		
			16-fold input module, IP20, terminals		GN		
			16-fold input module, IP20, terminals		N		
			8-fold output module PNP, 5-pin		A		
			8-fold output module, NPN		C		
			4-fold output module, 4xM12 PNP, 5-pin		GA		
			Place holder for valve terminal CPV, CPA		P		
	6	Second connecting cable	Terminal connection cable WS-WD, 0.5 m	3	Q		
			Terminal connection cable WS-WD, 2 m	3	R		
			Terminal connection cable WS-WD, 5 m	3 4	S		
			Terminal connection cable GS-WD, 5 m	3 4	K		
			Terminal connection cable GS-WD, 8 m	3 4	L		
			Terminal connection cable GS-GD, 2 m, for chain link trunking	3	U		
			Terminal connection cable GS-GD, 5 m, for chain link trunking	3 4	V		
			Terminal connection cable GS-GD, 8 m, for chain link trunking	3 4	W		
	7	Input module	16-fold input module, 16xM8 PNP	5	E		
			16-fold input module, 16xM8 Z	5	M		
			16-fold input module, 16xM8 NPN	5	I		
			8-fold input module, 8xM8 PNP, 3-pin	5	GE		
			16-fold input module, 8xM12 PNP, 5-pin	5	F		
			16-fold input module, 8xM12 NPN	5	J		
			8-fold input module, 4xM12 PNP, 5-pin	5	GF		
			16-fold input module, IP20, terminals	5	GN		
			16-fold input module, IP20, terminals	5	N		

2 **String 1 ... 4** The strings must be continuously occupied; min. string 1.

3 **Q, R, S, K, L, U, V, W**
A module must always be selected to follow the connecting cable.

4 **S, K, L, V, W** Total length per string: Max. 10 m

5 **E, M, I, GE, F, J, GF, GN, N**
Only 1 input module may be selected per string.

0 Options

	Acces-sories		Mains connec-tion	Fieldbus connection plug/ socket	Adapter	Socket	Plug	Plug (DUO)	H-rail mounting set	Connection plate set	User docu-mentation
	ZCP		...M, ...N, ...I, ...J	Z, T, U, F, G, V	...OF	...D	...S, ...W, ...P, ...R, ...C	...X, ...K	...H	...Y, ...L	D, E, F, S, I, V
ZCP 8		–		**V**					**10H**		

Ordering table

Module No.			18 270	Condi-tions	Code		Enter code
0	8	Accessories for ECP	Accessories for the electrical installation system CP		**ZCP-**		ZCP-
		Mains connection straight, 2.5 mm²	1 ... 99	6	**...M**		
		Mains connection straight, 1.5 mm²	1 ... 99	6	**...N**		
		Mains connection angled, 1.5 mm²	1 ... 99	6	**...I**		
		Mains connection angled, 2.5 mm²	1 ... 99	6	**...J**		
		Fieldbus connection plug/socket	Straight socket, M12, 4-pin, Pg7, for fieldbus connection	7	**Z**		
			Straight socket, M12, 4-pin, Pg9, for fieldbus connection	7	**T**		
			Cable socket, straight, Pg13.5	7	**U**		
			Angled socket, M12, 4-pin, Pg7, for fieldbus connection	7	**F**		
			Angled socket, M12, 4-pin, Pg9, for fieldbus connection	7	**G**		
		Plug	Straight plug, IP65, Sub-D, 9-pin, for Profibus DP	8 9	**V**		
		Adapter, 2x M12 B-coded, for Profibus DP	1 ... 99	8 10	**...OF**		
		Socket for fieldbus connection straight, M12, 5-pin, Pg9	1 ... 99	11	**...D**		
		Plug for sensors/ actuators straight, M12, 4-pin, Pg7	1 ... 99	12	**...S**		
		Sensor plug 4-pin, M12	1 ... 99	12	**...W**		
		Plug for sensors/ actuators straight, M12, 5-pin, Pg7	1 ... 99	12	**...P**		
		Plug for sensors/ actuators straight, M8, 3 pin, solderable	1 ... 99	13	**...R**		
		Plug for sensors/ actuators straight, M8, 3 pin, screw-in type	1 ... 99	13	**...C**		
		Plug for 2 cables (DUO) straight, M12, 4-pin, Pg11	1 ... 99	14	**...X**		
		Plug for 2 cables (DUO) straight, M12, 5-pin, Pg11	1 ... 99	14	**...K**		
		H-rail mounting kit	1 ... 99		**...H**		
		Connection set, complete, CP	1 ... 99	15	**...Y**		
		Connection set, complete (2x tension-spring sockets, LED)	1 ... 99	16	**...L**		
	8	User documentation	German manual		**D**		
			English manual		**E**		
			French manual		**F**		
			Spanish manual		**S**		
			Italian manual		**I**		
			Swedish manual		**V**		

6 **M, N, I, J** Not with fieldbus node and control block D1.

7 **Z, T, U, F, G** Only with fieldbus node and control block FB8, SF3, D1.

8 **V, OF** Only with fieldbus node and control block FB5, F13, D1.

9 **V** Not with accessory OF.

10 **OF** Not with accessory V.

11 **D** Only with fieldbus node and control block F11, SF6 or with module M.

12 **S, W, P** Only with module F, A.

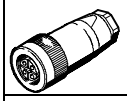
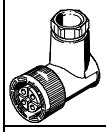
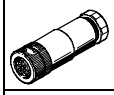
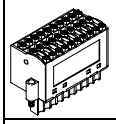
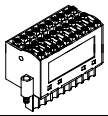
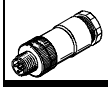
13 **R, C** Only with module E, M, I.

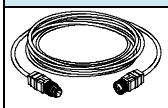
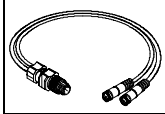
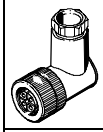
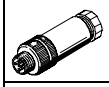
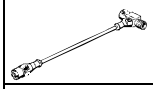
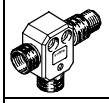
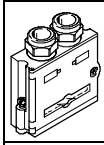
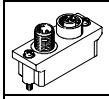
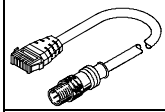
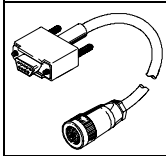
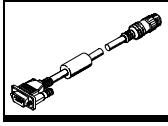
14 **X, K** Only with module F, J, A, C.

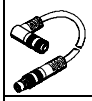
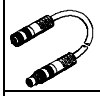
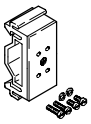
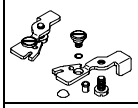
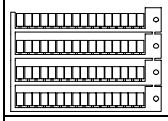
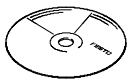
15 **Y** Only with module N.

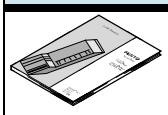
16 **L** Only with module GN.

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**
	Power supply socket, straight, M12	for 0.75 mm^2	**FBSD-GD-9-5POL**	**18 324**
	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**
Connection sets for power supply and sensors				
	Connection set, standard tension-spring socket, screw-in, consisting of ■ once PS1-SAC10-10POL ■ twice PS1 SAC30	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, 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**

Ordering data				
Designation			Type	Part No.
Sensor cables				
	Connecting cable, M12, 4-pin, straight plug-straight socket	2.5 m	**KM12-M12-GSGD-2,5**	**18 684**
		5.0 m	**KM12-M12-GSGD-5**	**18 686**
	Connecting cable, M12, 4-pin, straight plug-angled socket	1.0 m	**KM12 M12-GSWD-1-4**	**185 499**
	Connecting cable, M8, straight plug-straight socket	0.5 m	**KM8-M8-GSGD-0,5**	**175 488**
		1.0 m	**KM8-M8-GSGD-1**	**175 489**
		2.5 m	**KM8-M8-GSGD-2,5**	**165 610**
		5.0 m	**KM8-M8-GSGD-5**	**165 611**
	DUO cable M12	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**
Fieldbus connection				
	Bus connection, straight	PG7	**FBSD-GD-7**	**18 497**
		PG9	**FBSD-GD-9**	**18 495**
		PG13.5	**FBSD-GD-13,5**	**18 496**
		PG9	**FBSD-GD-9-5POL**	**18 324**
	Bus connection, angled	PG7	**FBSD-WD-7**	**18 524**
	Plug, straight, 5-pin for T-adapter		**FBS-M12-5GS-PG9**	**175 380**
	T-adapter for fieldbus		**FB-TA**	**18 498**
	T-adapter for DH-485		**FB-TA-M12-5POL**	**171 175**
	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**
Diagnostic/data connection				
	Programming cable for SB/SF60	3 m	**KDI-SB60-3,0-M12**	**171 173**
		6 m	**KDI-SB60-6,0-M12**	**175 686**
		10 m	**KDI-SB60-10,0-M12**	**171 174**
	Programming cable for SF3	5 m	**KDI-SB202-BU9**	**150 268**
			KDI-SB202-BU25	**30 437**
	Cable for DTAM Micro	3 m	**KDTAM-SB60-3-M12**	**188 979**
		6 m	**KDTAM-SB60-6-M12**	**188 980**
		10 m	**KDTAM-SB60-10-M12**	**188 981**

Ordering data				
Designation			Type	Part No.
Valve terminal connection				
	Connecting cable WS-WD	0.5 m	**KVI-CP-1-WS-WD-0,5**	**178 564**
		1 m	**KVI-CP-1-WS-WD-1.0**	**191 892**
		2 m	**KVI-CP-1-WS-WD-2**	**163 139**
		3 m	**KVI-CP-1-WS-WD-3.0**	**191 893**
		5 m	**KVI-CP-1-WS-WD-5**	**163 138**
	Connecting cable GS-WD	5 m	**KVI-CP-1-GS-WD-5**	**163 137**
		8 m	**KVI-CP-1-GS-WD-8**	**163 136**
	Connecting cable GS-GD	2 m, for chain link trunking	**KVI-CP-2-GS-GD-2**	**170 234**
		5 m, for chain link trunking	**KVI-CP-2-GS-GD-5**	**170 235**
		8 m, for chain link trunking	**KVI-CP-2-GS-GD-8**	**165 616**
Mounting set				
	Mounting for H-rail		**CP-TS-HS35**	**170 169**
	Mounting for H-rail		**IBGH-03-4,0**	**18 649**
Protective caps				
	Protective caps for sealing unused sockets (10 pieces)		**ISK-M8**	**177 672**
	Protective caps for sealing unused sockets (10 pieces)		**ISK-M12**	**165 592**
Inscription labels				
	Inscription labels 6x10 mm in frames (64 pieces)		**IBS-6x10**	**18 576**
Software				
	Programming software FST200 with manual for SF3	German	**P.BE-FTS200-AWL/KOP-DE**	**165 484**
		English	**P.BE-FTS200-AWL/KOP-EN**	**165 489**
	CD-ROM	Valve terminals	**P.CD-VALVE-T**	**183 350**
		Utilities	**P.CD-VI-UTILITIES-2**	**533 500**

Ordering data – User documentation				
Designation			Type	Part No.
	Bus node CP-FB05-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**
	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**
	Bus node CP-FB08-03	German	**P.BE-CP-FB08-03-DE**	**165 108**
		English	**P.BE-CP-FB08-03-EN**	**165 208**
		French	**P.BE-CP-FB08-03-FR**	**165 138**
		Italian	**P.BE-CP-FB08-03-IT**	**165 168**
		Spanish	**P.BE-CP-FB08-03-ES**	**165 238**
		Swedish	**P.BE-CP-FB08-03-SV**	**165 268**
	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**
	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**
		Spanish	**P.BE-CP-FB13-E-ES**	**165 243**
		Swedish	**P.BE-CP-FB13-E-SV**	**165 273**
	Control block SF3	German	**P.BE-VISF3-03-DE**	**165 481**
		English	**P.BE-VISF3-03-EN**	**165 486**
		French	**P.BE-VISF3-03-FR**	**165 491**
		Italian	**P.BE-VISF3-03-IT**	**165 446**
		Spanish	**P.BE-VISF3-03-ES**	**165 496**
	Control block SB/SF6	German	**P.BE-VISB60-03-DE**	**184 572**
		English	**P.BE-VISB60-03-EN**	**184 573**
		Spanish	**P.BE-VISB60-03-ES**	**184 575**
	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, compact	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**

Festo automation components

Important components in our product range

Compressed air preparation

- D series service units
- MS series service units

Control technology

- Individual valve CPE
- Valve terminal CPV
- Modular valve terminal MPA and electrical terminal CPX
- Smart Positioning Controller SPC200
- Controller FEC Standard FC640

Long linear movement

- Rodless cylinder DGPL
- Electric toothed-belt drive DGE
- Standard cylinder DNC and DSNU
- Compact cylinder ADVU

Short linear movement

- Linear module HMP
- Guided drive DFM
- Mini slide SLT
- Flat slide SLG
- Linear module HMPL
- Short-stroke cylinder ADVC

Rotary movement

- Rotary drive DRQD
- Swivel module DSM
- Swivel/linear module DSL

Gripping, mechanical ...

- Precision gripper HGPP
- Micro gripper HGWM
- Three-point gripper HGD

... or with vacuum

- Suction gripper ESG
- Vacuum generator VADMI
- Vacuum generator VN

Connecting and installing

- Basic elements
- Screw connectors
- Couplings
- Fittings and restrictors
- Tubing

Checking, counting, sorting

- Checkbox family

Further products and details: http://catalog.festo.com or consult your Festo technical advisor.

Pictograms


Stroke length


Swivel angle


Connection


Vacuum


Diameter


Flow rate


Pressure


Force


Voltage


Temperature range


Width


Service


Worldwide service

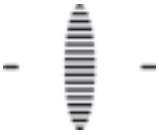

Collection facility


Repair service


Hotline


Delivery time


In stock


Note


New


Type to be discontinued


Spare parts service