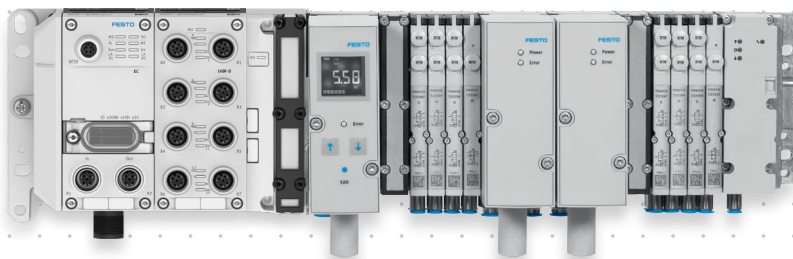




Valve terminal MPA – 3 variants, 3× perfection

Really communicative – now with CPX-AP-A / -I



Highlights

MPA-S

- 128 valve functions/64 valve positions
- Multiplexing with proportional-pressure regulators
- Soft-start/quick exhaust valves
- Pilot air switching valves with internal pressure sensing or M8 push-in connector
- Switching position sensing valves
- Additional electrical supply with push-in connectors M18, 7/8" or M12 A-coded

MPA-L

- Valves on single or 4-way sub-base
- Cost-effective, tamper-proof fixed flow restrictor
- Self-configuring Festo I-Port connection

MPA-C

- Clean design valve terminal in IP69K
- FDA-compliant materials, NSF-H1 grease
- Valves on individual sub-bases

Now with maximum function integration and many electrical connection options, such as multipin, IO-Link / I-Port, CPX. Now also extended by CPX-AP-A and CPX-AP-I. This is MPA!

CPX-AP-A + MPA-S = opening up even more possibilities

This perfectly networked combination broadens the application areas for the MPA-S even further. Ideal as a standard in factory automation or the process industry. The maximum process reliability it offers and the minimal installation effort provide outstanding efficiency.

CPX-AP-A / -I + MPA-L API interface

Get to where you need to be instantly by quickly connecting valve terminals with all common fieldbus technologies. Scalable into several decentralised installation units.

CPX-AP-A / -I with IO-Link master + MPA-C and I-Port – the hygienic combination

This is a tough performer, even when it comes to cleaning, thanks to IP69K degree of protection and Festo corrosion resistance class CRC4.



Additional information:

Electric automation

> <http://www.festo.com/ea>

Product pages

> [MPA-S](#)

> [MPA-L](#)

> [MPA-C](#)

Engineering tools

> [Festo Automation Suite](#)

> [Engineering tools](#)

> [Connectivity Finder](#)

Support tools

> [Conceptualisation and design](#)

> [Assembly and commissioning](#)

> [Operation and modernisation](#)



Modular remote I/O system CPX-AP-A – stand-alone or with valve terminal

The goal is to have unrestricted and seamless connectivity, embedded in future-ready and compatible concepts for the flexible automation of complete machines or individual machine modules. That is why Festo offers mechanical, electric and intelligent automation modules that work together perfectly and do not impose any technical limitations.

Combined on the Automation Platform (AP)

The Automation Platform (AP) from Festo forms the basis for a new generation of remote I/O or RIO systems that enables a freely scalable, flexible and powerful system architecture. The AP uses a hybrid approach to combine modular CPX-AP-A and decentralised CPX-AP-I structures. Remote I/O and control technology are thus combined with electric and pneumatic automation technology to create a comprehensive architecture.

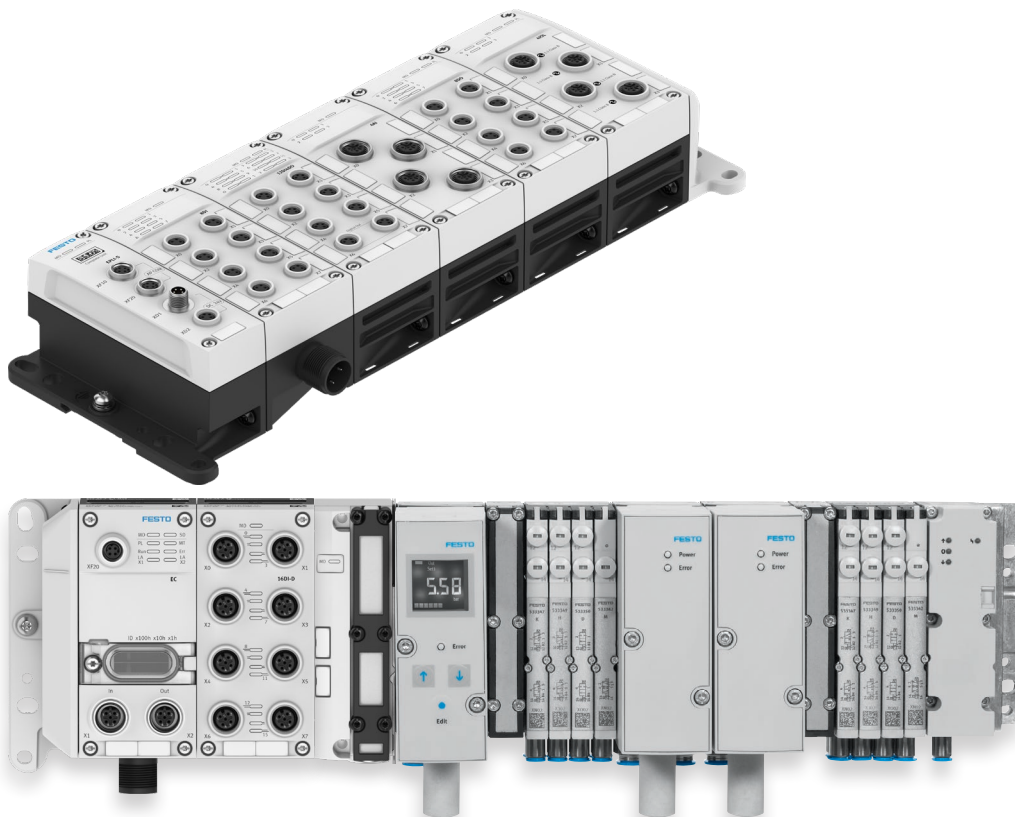
Combined with pneumatics

Many of the valve terminals from Festo, such as MPA, VTUX, VTSA and VTUG, can be very flexibly integrated into the system using AP communication. They are either connected directly to the CPX-AP-A or integrated into a decentralised system as a stand-alone valve terminal using the AP interface. In addition, all IO-Link-capable valve terminals can be integrated into the AP via IO-Link master. This means that both CPX remote I/O systems and AP communication allow the valve terminals to be freely and flexibly integrated in the machine architecture.

This includes mechanics, complete servo drive systems, state-of-the-art communication and control concepts as well as digitalisation with suitable cloud solutions.

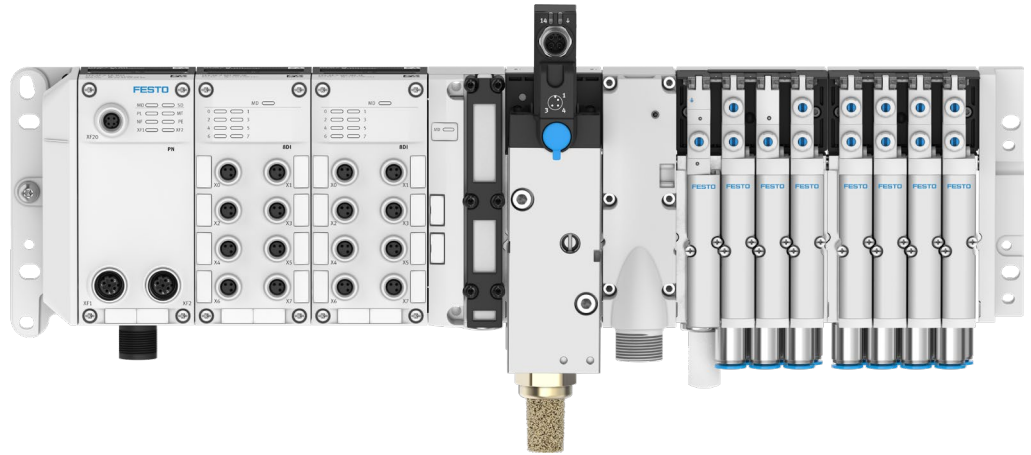
Combined with electric drives

All electric drives from the Simplified Motion Series can be connected directly to the remote I/O systems via IO-Link®. A wide variety of linear and rotary electric movements can thus be an integral part of technology-independent automation concepts based on AP and can be flexibly integrated into different networks.



Highlights

- Highly flexible remote IO system in IP65/IP67
- Stand-alone system or in combination with a valve terminal from Festo
- Various I/O modules and IO-Link® are available, including for electric drives
- Outstanding performance thanks to AP communication in real time with 200 MBaud and 250 µs cycle time
- The complete AP system architecture is easy and convenient to configure and quick to commission



The lightweight CPX-AP-A remote I/O system is integrated directly into Ethernet-based networks that are available worldwide. A variety of additional input and output modules as well as IO-Link master modules are also available. A scalable system topology can be created using pneumatics with valve terminals, proportional technology as well as Controlled Pneumatics that are directly adapted or connected via AP communication.

Electric drive technology for linear and rotary movements can be connected via IO-Link®.

Modular

The complete terminal with up to 15 I/O modules forms the backbone of state-of-the-art automation topologies that are open for future developments. The CPX-AP-A is extremely flexible, both in terms of electrics and mechanics thanks to I/O modules, flexible connection technology, valve terminals and a variable voltage concept. The AP communication combines modular and decentralised structures that are freely scalable in terms of terminal size and range of functions to match the requirements of the application.

Extremely communicative

The AP communication takes place in real time with a transmission rate of 200 Mbit full duplex and processes a large amount of incoming and outgoing process data of 2 kByte each. An AP communication system comprises up to 80 modules, including I/O modules and IO-Link master modules with powerful point-to-point communication from the CPX-AP-A and AP-I as well as valve terminals and sensors.





Remote I/O system CPX-AP-I + MPA-S

The remote I/O system CPX-AP-A is all about modularity. The modules can be combined and positioned as required and they can be arranged in a way that best suits your control concept. Rearranging them later on is not a problem either and can be done mechanically or during commissioning and programming using the Festo Automation Suite. All I/O modules, the IO-Link master and especially the fieldbus module

provide this high degree of flexibility. All modules can be freely positioned, independently of the power supply, which is also freely positionable, and any possible voltage zones. This high level of modularity applies to the electric and pneumatic systems of the most important valve terminals.

1 Intelligent end plate

Cost-effective and compact AP communication interface on the standalone RIO or RIO terminal with valve terminal

- For connection with other AP participants
 - Modular RIO terminal CPA-AP-A
 - Decentralised RIO modules CPX-AP-I
 - Valve terminals with AP interface
- Two variants for 24 V DC power supply
 - Only voltage output for additional AP participants, internal power supply with system supply at the RIO terminal
 - Voltage input for the RIO and voltage output for other AP participants without valve terminals
- Mounted in place of the left end plate

2 Input and output modules

All modules can be combined as required and can be flexibly connected in series.

- Digital 8/16-way input and output modules, in future also 32-way
- Analogue 4/8-way input and output modules
- Various connection technologies: M8 and M12, in future also push-in connection (IP20)

3 Interlinking module

The modules without power supply forward the voltage and communication from one module to the next and to the valve terminal.

4 LEDs for diagnostics

Module-specific LEDs indicate the operating status of the module or the connected sensors and actuators, such as

- Communication
- Power supply
- Channel status
- Input/output diagnostics

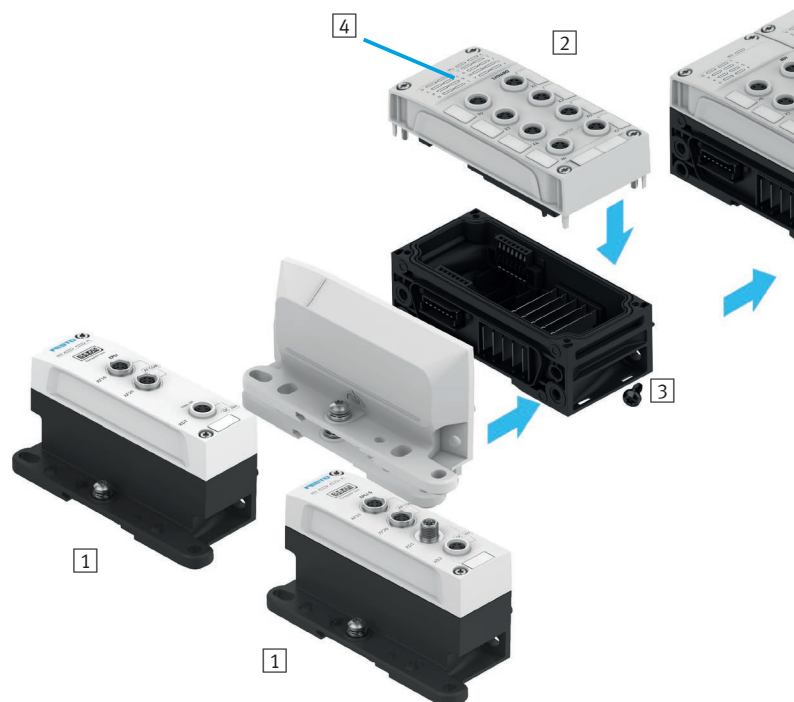
5 IO-Link master

For exchanging data with any decentralised IO-Link® devices at field level, such as

- Electric drives
- Proportional valves
- Vacuum generators
- Sensors, etc.

6 Fieldbus module

- The CPX-AP-A is connected to a higher-level control system via the bus interface for communication in Ethernet-based networks.
- High data transfer rate
- Transmission of non-real-time-critical information, e.g. for diagnostics and configuration
- Sufficient Ethernet bandwidth to transmit real-time and non-real-time data in parallel
- The position of the module can be freely selected, regardless of the 24 V DC system supply.





7 Interlinking module with power feed

24 V DC supply voltage is fed into the CPX-AP-A via the interlinking modules and reliably forwarded to the CPX-AP-A modules and the valve terminal:

- Electronics of the automation system CPX-AP-A (system voltage)
- Inputs, outputs and valves (load voltage)

In addition, there are special variants for supplying outputs, as well as valves for creating voltage zones. The electronics are still supplied by the main power supply:

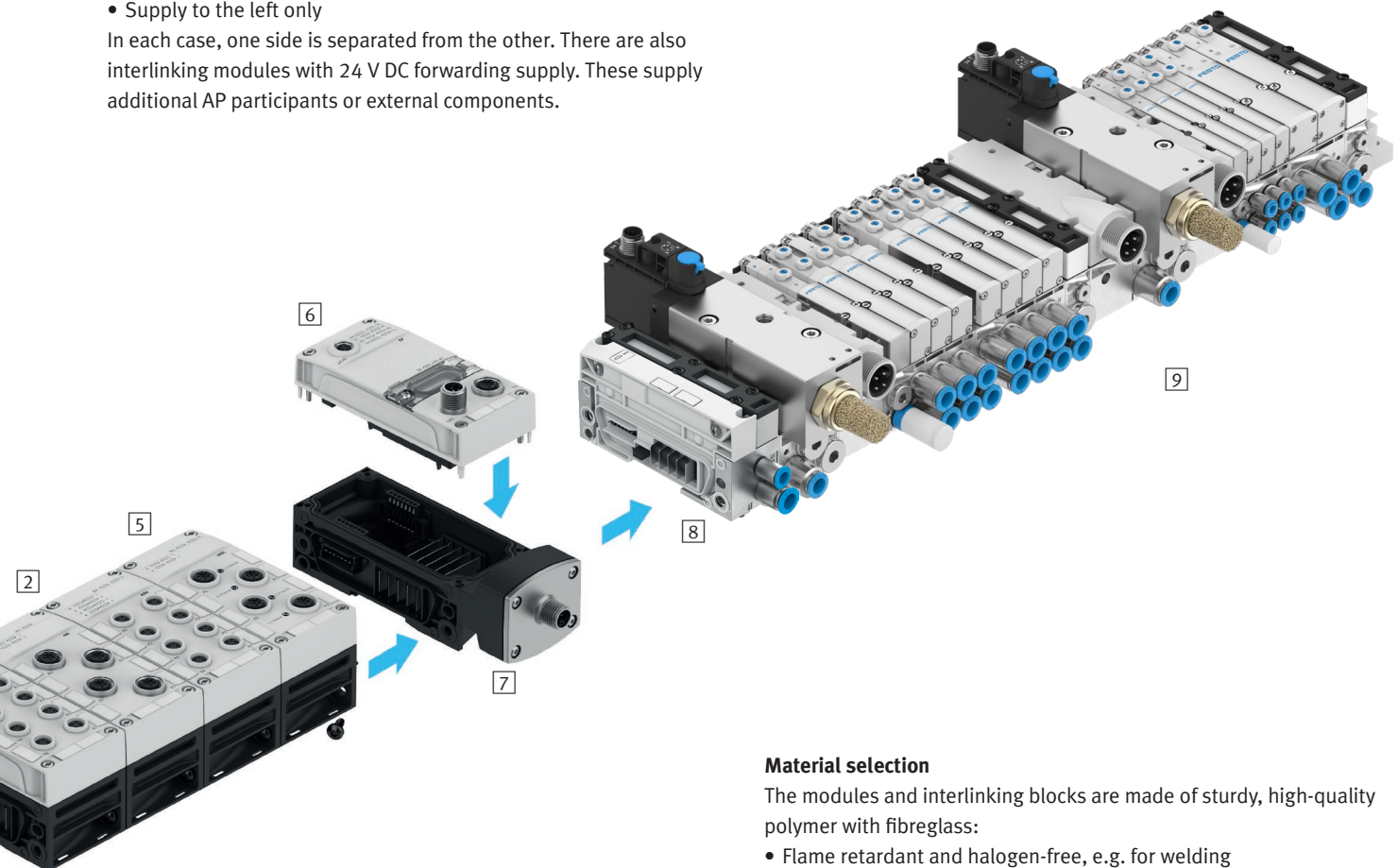
- Supply to the right
- Supply to the left only

In each case, one side is separated from the other. There are also interlinking modules with 24 V DC forwarding supply. These supply additional AP participants or external components.

9 Valve terminal variants

There is a choice of different valve terminals. These are permanently connected to the modular RIO via their pneumatic interface:

- Highly modular: VTUX
- Very compact: MPA-S
- Sturdy and powerful: VTSA



8 Pneumatic interface

The pneumatic interface is the mechanical adapter between the RIO modules and the attached valve terminal

- Interfaces for VTUX and MPA-S
 - Integrated flat plate silencer
 - Compressed air connection
 - Internal pilot air / external pilot air
- Interface for valve terminals VTSA
 - Module position for any CPX-AP-A module, e.g. bus interface, I/O module, IO-Link master
 - Optional voltage supply and voltage forwarding
 - Short-circuit shutdown, short-circuit diagnostics

Material selection

The modules and interlinking blocks are made of sturdy, high-quality polymer with fibreglass:

- Flame retardant and halogen-free, e.g. for welding
- High electromagnetic compatibility
- Low weight
- Without epoxy resin, environmentally friendly and easy to recycle
- Metal is used when this is required to meet standards or for assembly:
 - Metal screw connections on the system supply
 - Metal sleeves for shielding on plug connectors
 - End plates and pneumatic interfaces between the electrical system and valve terminal

Assembly of the CPX-AP-A remote I/O

The interlinking blocks are made of high-quality polymer with fibreglass and are mechanically connected using angled fittings.

- The connection can be undone and fastened again several times.
- The RIO terminal can therefore be flexibly expanded at any time.



MPA-S – communicative with many functions

Valve terminal variant MPA-S/CPX-AP-A

MPA is the right solution for every situation. With identical valves but different layouts, each version has its own strengths.

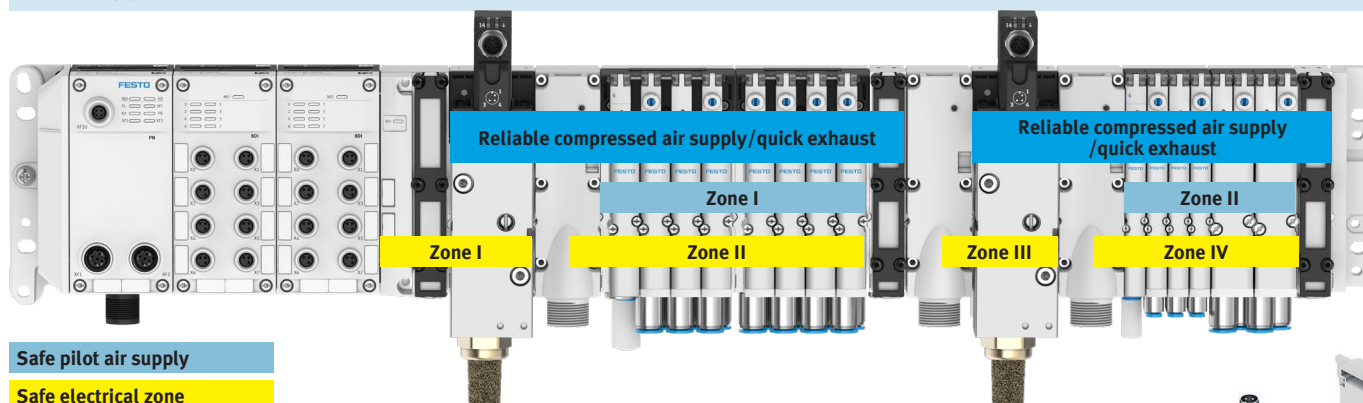
MPA-S, for example, is highly communicative and can be equipped with many additional functions. The MPA-S/CPX-AP-A with its integrated serial commu-

nication system can incorporate up to 128 valve coils and the functional integration of proportional-pressure regulators, pressure sensors, as well as parameterisation and diagnostics. Together with the CPX-AP-A, the MPA-S is an all-rounder in communication.

Benefits

- Function integration and diagnostics management for up to 128 valve coils/64 valve positions
- Integrated pressure sensors and proportional-pressure regulators with multiplexing option
- Broad range of operating voltage connections 24 V $\pm$ 25%
- Electropneumatic installation concept: centralised, decentralised, hybrid

New safety platform MPA-FB



Safe pilot air supply

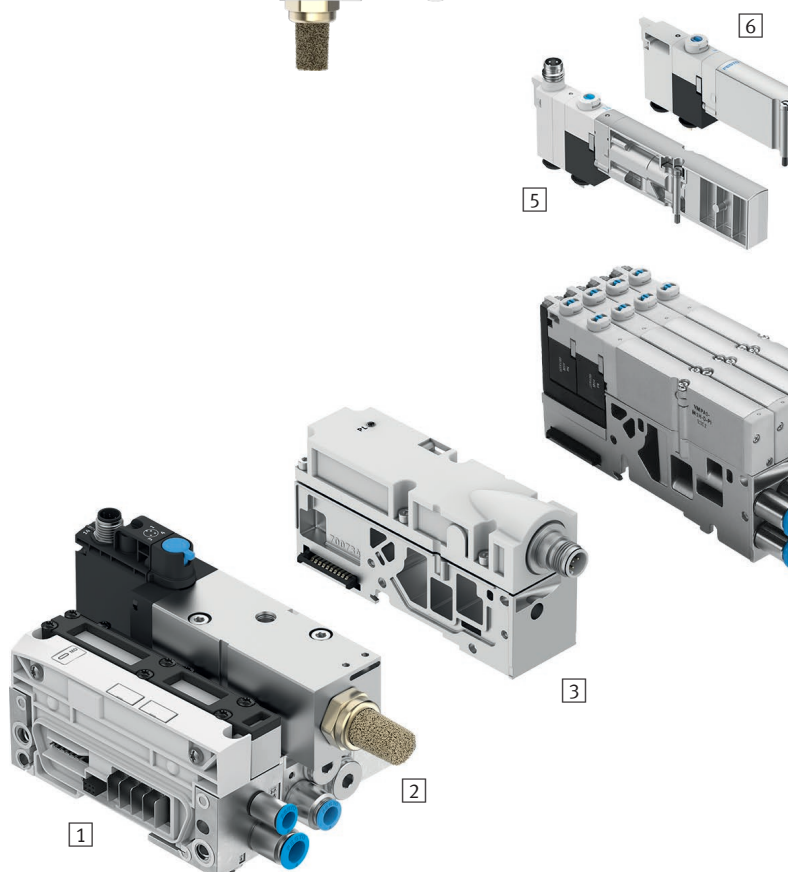
Safe electrical zone

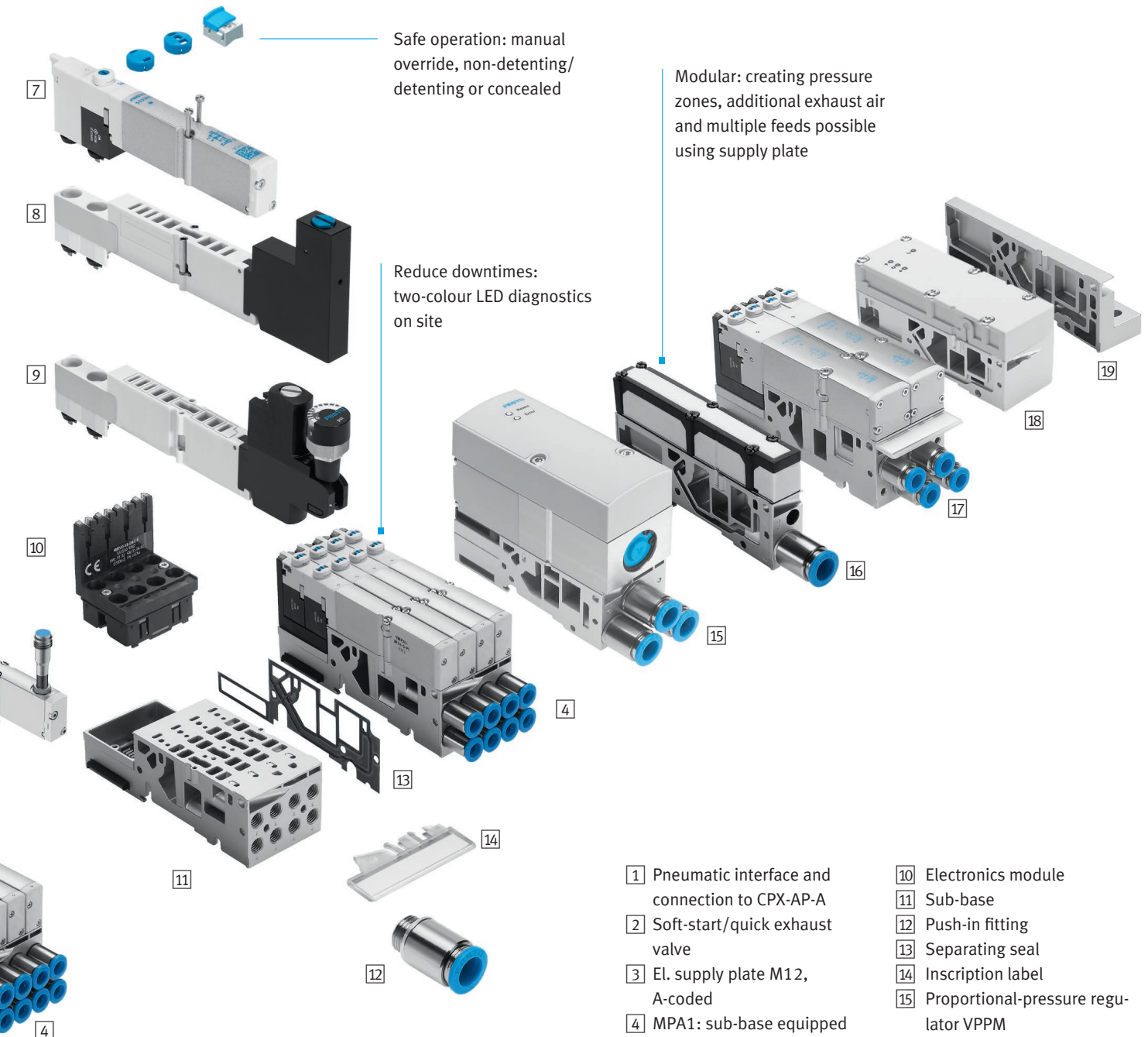
- One solution for all industry segments
- It is possible to convert all existing applications
- Improved service life values (B10)

It is possible to create voltage zones on a single valve terminal and to expand the system for the greatest number of valves and valve functions. This means that several valve terminals can be combined into a single valve terminal with common bus nodes.

Benefits

- Voltage zones and targeted power-off
- More safety with the PROFIsafe module CPX-FVDA-P2
- Individual power supply to individual components
- A choice of electrical connections: M18, 7/8 inch (4- or 5-pin) or M12 (4-pin, A-coded)

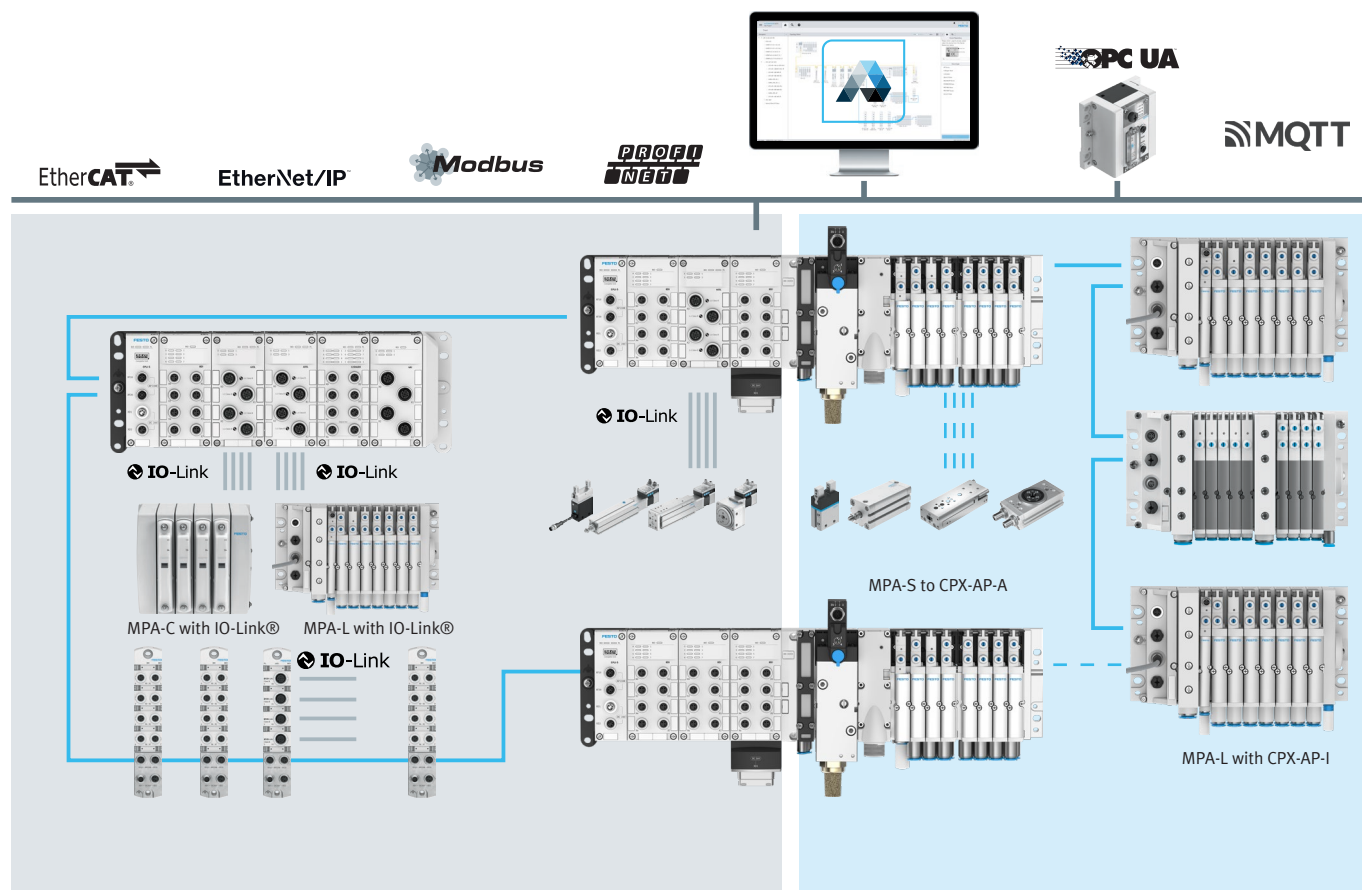




- | | |
|--|---|
| 1 Pneumatic interface and connection to CPX-AP-A | 10 Electronics module |
| 2 Soft-start/quick exhaust valve | 11 Sub-base |
| 3 El. supply plate M12, A-coded | 12 Push-in fitting |
| 4 MPA1: sub-base equipped with 4 valves, width 10 mm | 13 Separating seal |
| 5 Pilot air shut-off valve | 14 Inscription label |
| 6 Switching position sensing valve | 15 Proportional-pressure regulator VPPM |
| 7 Sub-base valve | 16 Supply plate with flat plate silencer |
| 8 Vertical pressure shut-off plate | 17 MPA2: sub-base equipped with 4 valves, width 20 mm |
| 9 Manual pressure regulator with pressure gauge | 18 Pressure sensor |
| | 19 End plate |



CPX-AP-A / CPX-AP-I topology with MPA-S /-L /-C



Fieldbus
AP communication
IO-Link®
Compressed air

A complete terminal: modular CPX-AP-A plus directly adapted valve terminal MPA-S

CPX-AP-A

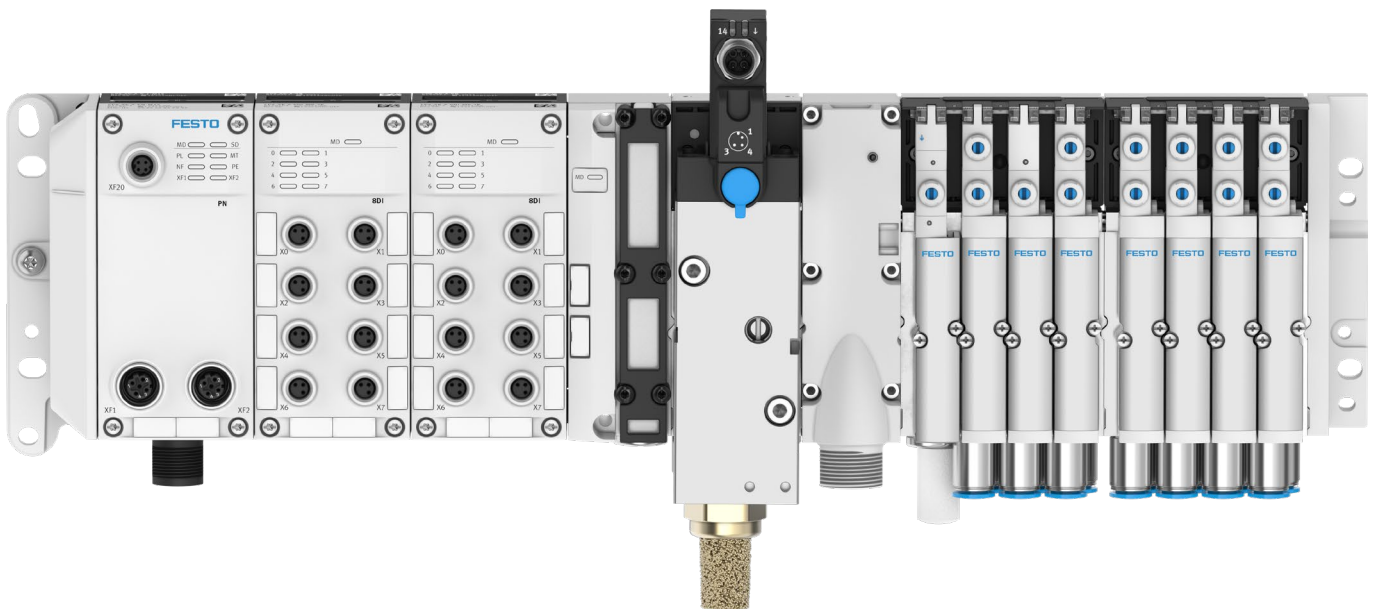
Up to 15 modules in IP65/67 can be integrated into the modular remote I/O CPX-AP-A. Together with the connected valve terminals, which are also available as industry and application-specific versions, this creates a complete terminal with a high degree of functional integration. This terminal can be installed directly in the machine, both in terms of the electrics and the pneumatics. It can be quickly, easily and reliably configured and commissioned as a single unit in the Online Shop using the Festo Automation Suite. The product is delivered fully assembled and always fully tested.

- Remote-I/O (RIO) with degree of protection IP65/67
- Communication via Ethernet-based fieldbus and AP communication
- 4/8-way input and output modules, in future also 32-way
- Freely positionable voltage supply
- Separated system voltage and load voltage
- Intermediate supply for voltage zones
- Voltage forwarding for other system components
- Lightweight thanks to sturdy, high-quality polymer with fibreglass
- Pneumatic interface with diagnostics LED and special additional features
- Fully tested, electrically, mechanically and pneumatically
- Digitalisation of pneumatics all the way to the cloud via AP

MPA-S

The compact and versatile valve terminal MPA-S with aluminium base plates offers three valve sizes, and can be mixed and matched on the valve terminal. There is also an option to integrate functions for proportional valves, pressure sensors as well as vertical stacking. Manual override and the two-colour diagnostics LED on each valve ensure reliable commissioning.

- Valve functions: 5/2, 5/3 and 2x 3/2, as well as 2x 2/2-way with special functions
- Up to 128 valve functions/64 valve positions
- Three sizes with max. 360 or 670 l/min
- Proportional pressure regulator and pressure sensor 0 ... 10 bar
- Soft-start/quick exhaust valve
- Pilot air switching valve with internal pressure sensing or via push-in connector M8
- Switching position sensing valve
- Additional electrical supply with push-in connectors M18, 7/8" or M12 A-coded
- Vertical stacking with valve pressure shut-off plate, manual pressure regulator with pressure gauge
- It is possible to have pressure zones, additional exhaust air and multiple power supply points



The benefits of this combination speak for themselves: the remote I/O together with the valve terminal forms 1 component that you can simply install directly in the application. This makes your system layout clearer, as everything is centralised in one place in the machine. And seamless engineering from the initial configuration through to commissioning greatly reduces your workload.

- Freely selectable module sequence
- 1 type code for RIO and valve terminal
- Delivered fully tested
- Easy, direct access to the machine
- Clear machine layout
- Cost-efficient design



Greater safety for MPA-S: cost-efficient retrofitting

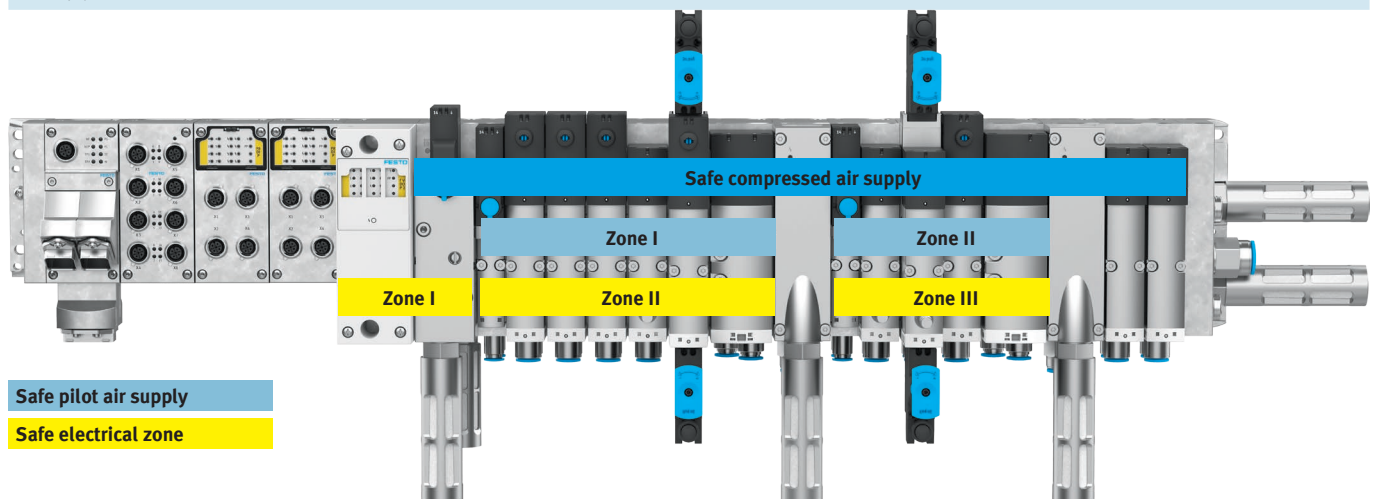
VTSA as an example

Update your MPA-S system to the latest safety level with CPX or multi-pin and take the VTSA as an example!

The valve terminals VTSA are mainly used in the automotive sector. There, they have already proven their worth as a safety platform. Now you can use the benefits of both valve types, which have already shown how effective they are on the VTSA and the MPA. This is how

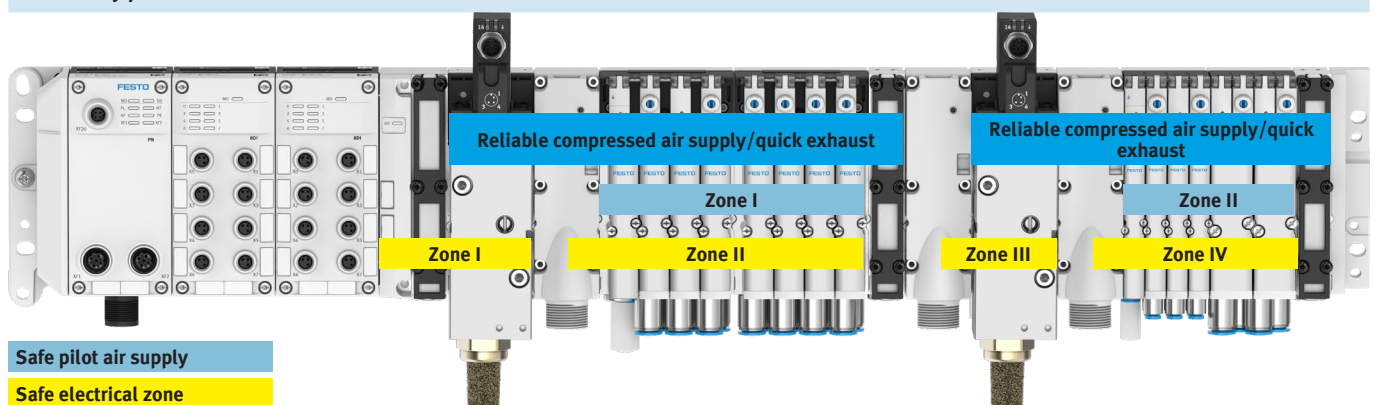
you can easily implement the machine safety guidelines! Even when the machines have already been put into operation, the soft-start/quick exhaust valves VABF-S6-1-P5A4-xx as well as the pilot air switching valves VMPAxx-M1H-xx-PI can be easily and cost-effectively retrofitted.

Safety platform VTSA-F-CB



- Safe I/Os in combination with a valve terminal
- Individual safety (sub)functions on the individual drive
- Safe control of the compressed air supply
- Safe zone concept

New safety platform MPA-FB



- One solution for all industry segments
- It is possible to convert all existing applications
- Improved service life values (B10)

What do you use the valves for?

You can safely switch off the pilot air with the pilot air switching valve VMPAxx-M1H-xx-PI.

Each zone of the MPA-S can be switched off individually with the soft-start/quick exhaust valve VABF-S6-1-P5A4-xx, so that you can change individual valve slices during operation, for example.

Switching off individual zones and using the soft-start function

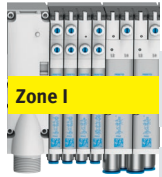
Thanks to a modular design, existing MPA-S systems can be modernised cost-efficiently, enabling individual zones to be switched off and allowing a safe and soft start-up of the system. These simple safety concepts will not only save you money but will also enable you to comply with the latest safety requirements thanks to efficient and simple retrofitting.



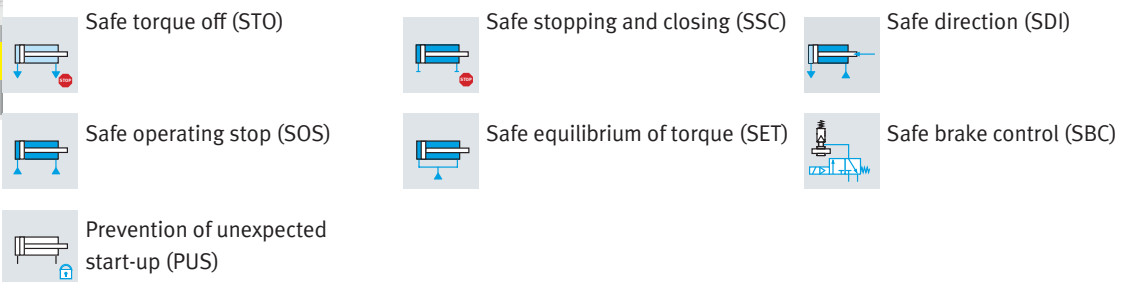
Types of valve zones

When a zone is switched off, the valves perform one or more safety (sub)functions depending on the selection or configuration.

Valves



Depending on the valve selection, the following drive-related safety sub-functions can be implemented up to PL c:

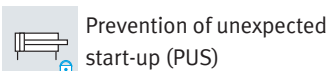


Pilot air switching valve + working valves

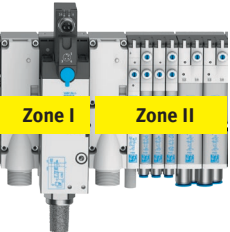


The same drive-related safety functions as above can be realised.

By integrating a pilot air switching valve, the "prevention of unexpected restart" (PUS) can additionally be realised up to PL d for the relevant valves.



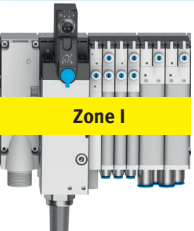
Soft-start valve (own zone) + pilot air switching valve + working valves



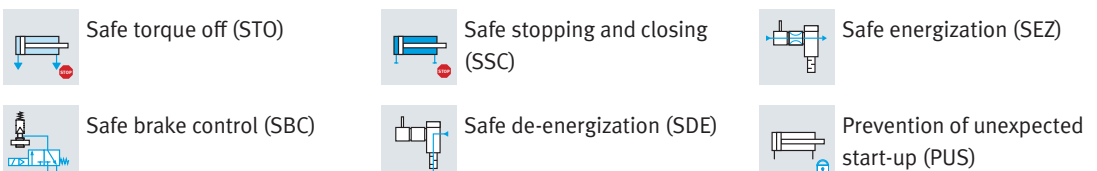
Zone 1: The soft-start/quick exhaust valve is used in the event of a fault or if the entire zone(s) (up to PL c) need to be exhausted:



Soft-start valve + pilot air switching valve + working valves



If exhausting the zone is the essential safety function, the soft-start/quick exhaust valve and working valves can be located in the same zone:



Internal or external safety modules? Both are possible!

Depending on the configuration of your system, you can actuate the safety modules internally or externally, then via external safety modules.



Remote I/O system CPX-AP-A + MPA-L via AP communication

CPX-AP-A

The modular stand-alone RIO CPX-AP-I communicates with up to 15 modules in real time. The valve terminals are connected via AP communication. Thanks to protection class IP65/67, the RIO and the terminals can be directly installed in the machine, even in the case of industry- and application-specific valve terminals.

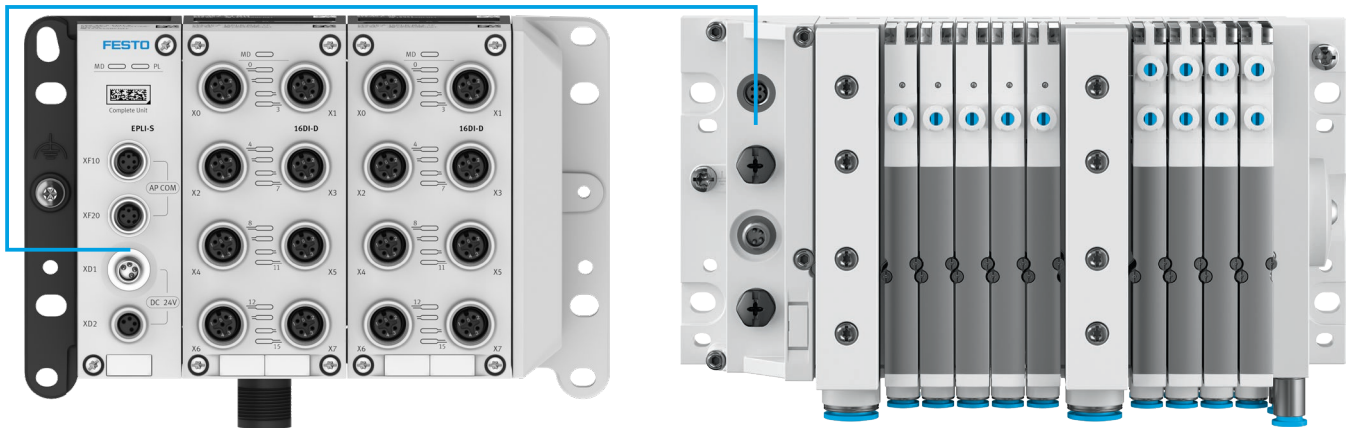
The individual modules can be quickly, easily, flexibly and reliably configured in the Online Shop, while they can all be commissioned together via the Festo Automation Suite.

- Remote-I/O (RIO) with degree of protection IP65/67
- Communication via Ethernet-based fieldbus and AP communication
- 4/8-way input and output modules, in future also 32-way
- Freely positionable voltage supply
- Separated system voltage and load voltage
- Intermediate supply for voltage zones
- Voltage forwarding for other system components
- Lightweight thanks to sturdy, high-quality polymer with fibreglass
- Pneumatic interface with diagnostics LED and special additional features
- Fully tested, electrically, mechanically and pneumatically
- Digitalisation of pneumatics all the way to the cloud via AP

MPA-L

The flat and modular valve terminal MPA-L is equipped with high-performance valves in a sturdy metal housing. The three valve sizes, the numerous options for vertical stacking, the additional supply and exhaust can be flexibly combined on the MPA. Commissioning is very reliable thanks to the manual override and LEDs for diagnostics.

- Three sizes with a flow rate of up to 870 l/min
- Many functions
 - 5/2-, 5/3-, 3/2-way and 2 x 2/2-way valves
 - Pressure regulator plate, pressure shut-off plate, supply plate for 1 valve position
 - Pilot air valves with pressure sensing via push-in connector M8
 - Switching position sensing valves
- Flexible configuration of up to 32 solenoid coils
- The compressed air supply and exhaust air can either be positioned on the end plate or on the side for a more compact design



Designing the electric and pneumatic machine structure is straightforward. The decentralised installation of the valve terminal close to the consumer in the machine offers a clear layout. Overheads are reduced as only 1 fieldbus is required for all AP participants to communicate with the higher-level control system. Last but not least, commissioning all the communicating devices is very simple and carried out with a single tool, the Festo Automation Suite.

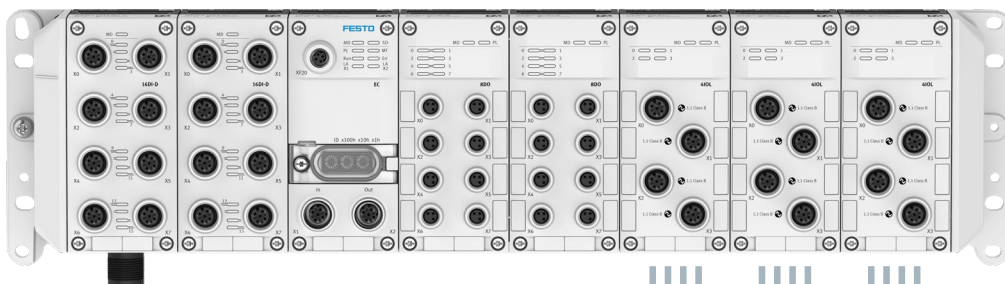
- Consumer-optimised machine layout
- Flexible electric (remote I/O) and pneumatic (valve terminal) system design
- Cost-efficient design and reduced overheads
- Real-time communication of all AP participants
- Joint commissioning using 1 tool

Remote I/O system CPX-AP-A + MPA-C with I-Port or MPA-L with IO-Link®

The modular RIO CPX-AP-I can accommodate up to 15 I/O modules and IO-Link master modules on one terminal, either as a stand-alone system or with a valve terminal. Thanks to IP65/67, the system can be installed directly in the machine and then configured and commissioned using the Festo Automation Suite. The device descriptions (IODD) are readily available in the tool. You can simply download them and then parameterise the system using the IO-Link® plug-ins

3 highlights

- Modular RIO stand-alone system with up to 4 devices per IO-Link master module
- You can search for and directly download device descriptions (IODD) in the Festo Automation Suite
- Fast and convenient commissioning as a system using the Festo Automation Suite



 **IO-Link**



MPA-C + I-Port



MPA-L + IO-Link®

IO-Link® configuration

The IO-Link® tool and the IO-Link® extensions are already integrated in the Festo Automation Suite (FAS). Search for the relevant device descriptions (IODD) in the FAS search field, download them and save them in the repository. All you have to do now is configure the IO-Link® product in the FAS, and to parameterise it using the corresponding IO-Link® plug-ins. Done!

This applies to all IO-Link® products from Festo, but also to products from other manufacturers. You can find out more about the Festo Automation Suite on page 24.

1 Integrating pneumatic components into AP communication via IO-Link®

There are many aspects to realising cost-efficient pneumatics: product costs, installation costs, compressed air consumption, as well as process speed and cycle times. The closer to the consumer the compressed air distribution is located, the lower these costs are and the more efficient production is. The aim of modern automation should be to realise small, decentralised solutions that are as close to the consumer as possible.



MPA-L – highly modular

Remote I/O system CPX-AP-A + MPA-L via AP communication

Maximum modularity together with top pneumatic performance

The MPA-L is especially interesting wherever maximum modularity and maximum pneumatic performance need to be combined and at a favourable price. The flexible system with individual sub-bases is modular in single steps. The pneumatic performance can thus be perfectly adapted to any application while saving space and money.

Benefits

- Flexible thanks to modular tie rod system, valves can therefore be quickly added in single steps
- Favourable 4-way sub-bases for additional cost benefits
- Fieldbus terminal or multi-pin terminal to IP40 and IP65
- Pneumatic supply from the front or side
- Extremely easy to configure with the product configurator, no need for special orders

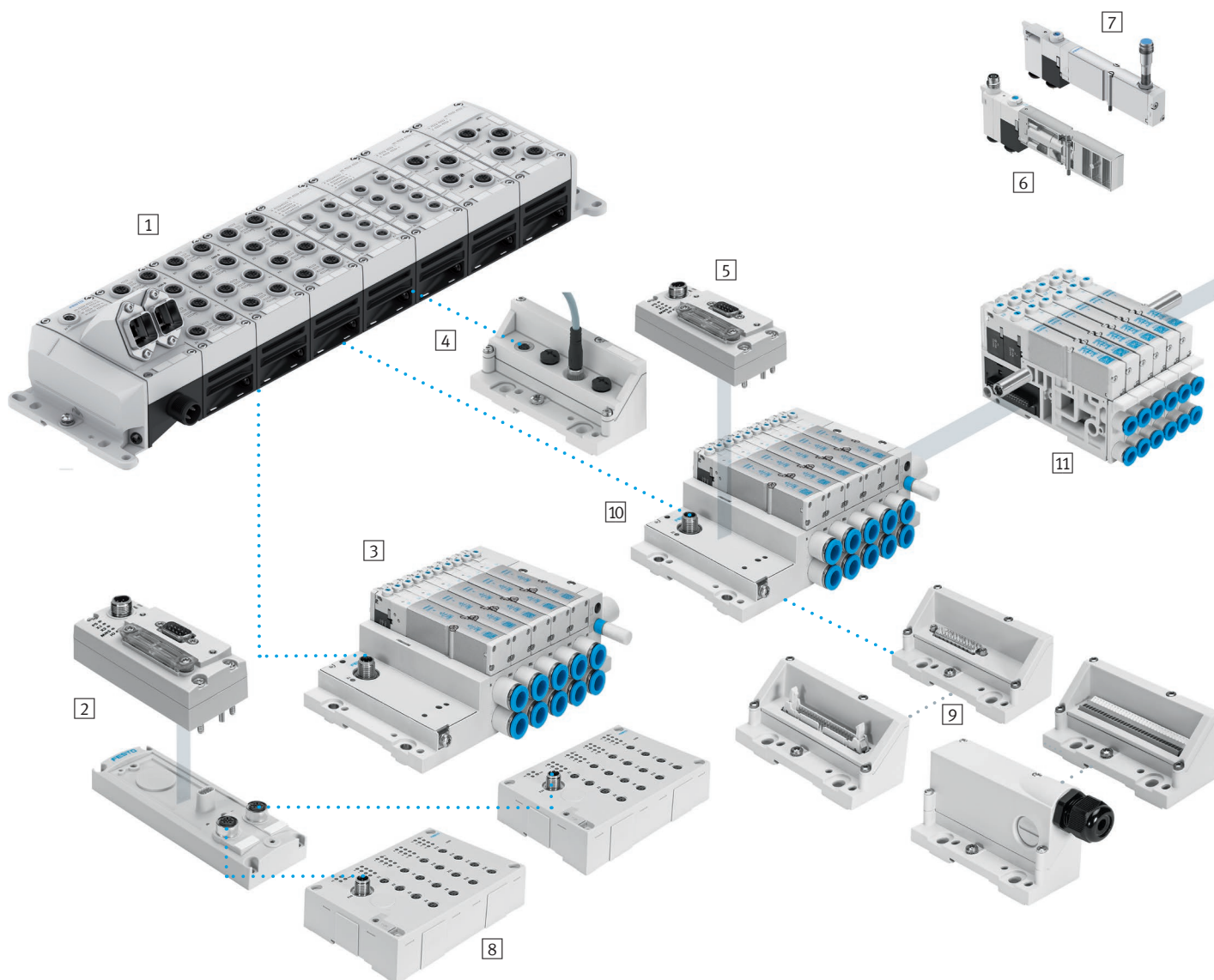
Sturdy and reliable

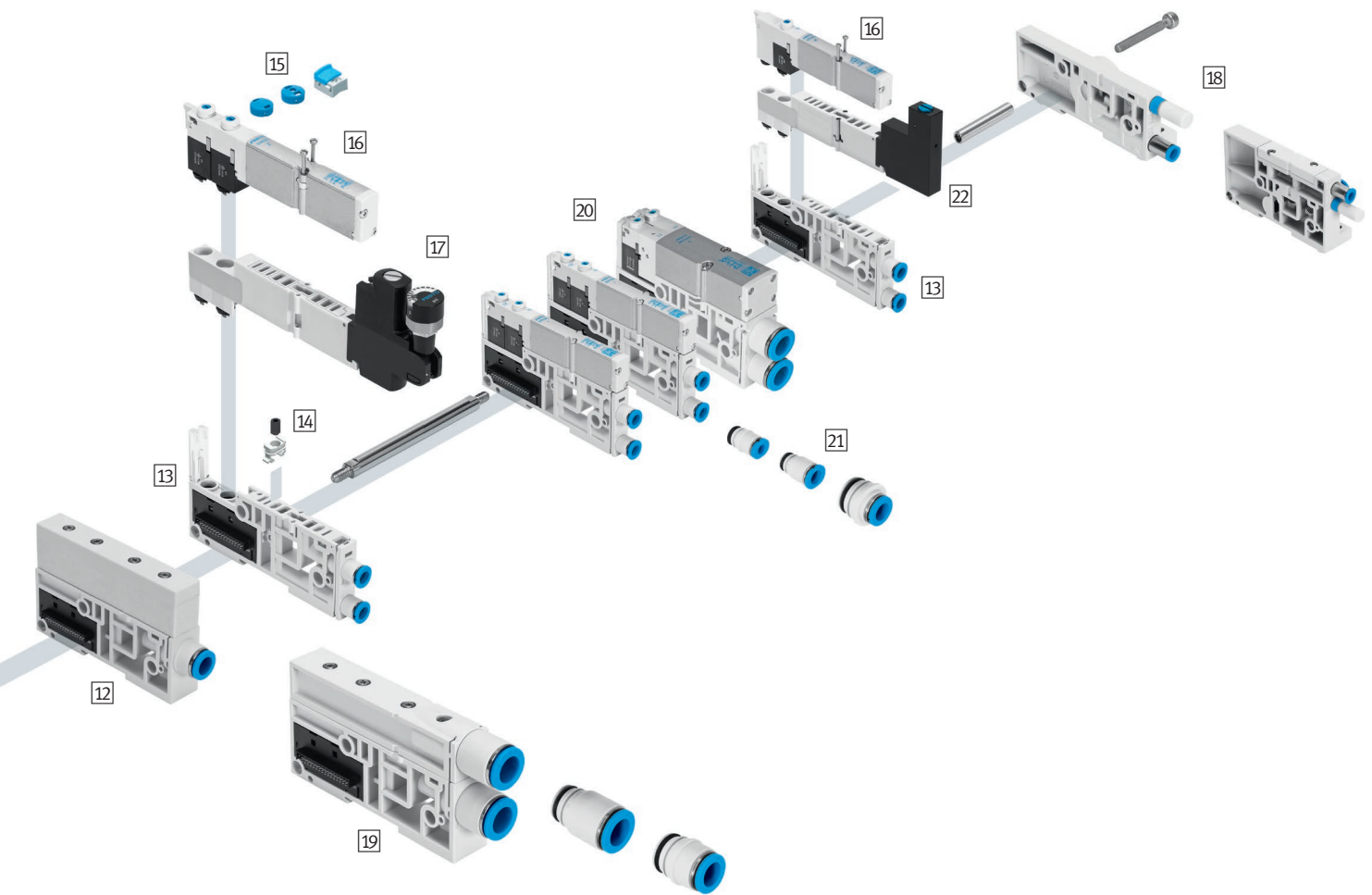
Very high quality, lightweight polymer housing, indispensable in harsh everyday operation with corrosive media or dynamic movements. In addition, it has high flow rates and can be equipped with up to 32 valves in single steps. The bus connection via the Festo I-Port is amazingly flexible. All in all, it is extremely adaptable, particularly if future changes need to be reacted to quickly.

The fixed flow restrictor, which is tamper-proof and more economical than conventional throttle valves, means fewer time-consuming adjustments for series machines.

Benefits

- Lightweight materials with improved corrosion resistance
- Inexpensive and tamper-proof fixed flow restrictor for series machines





- | | | | |
|---|---|--|--|
| 1 Modular electrical terminal CPX-AP-A | 5 Festo plug and work: fieldbus node CTEU for simple and direct connection of valve terminals | 10 Festo I-Port connection: standardised communication interface | 16 Sub-base valve |
| 2 Extension to small installation system with CAPC adapter: for 2 MPA-L or 2 input modules CTSL | 6 Pilot air shut-off valve | 11 MPA1: sub-bases equipped with 6 valves | 17 Manual pressure regulator |
| 3 CPX – CTEL: up to 4 MPA-L or 4 input modules CTSL with Festo I-Port | 7 Switching position sensing valve | 12 Power supply module with silencer | 18 End plates |
| 4 Interface CPX-AP-I | 8 Input module CTSL | 13 Sub-base | 19 Power supply module with exhaust plate |
| | 9 Multi-pin connection with Sub-D, terminal strip (cage clamp) or ribbon cable | 14 Fixed flow restrictor | 20 Single valves (available widths: 10 mm, 14 mm, 20 mm) |
| | | 15 Non-detenting, detenting or concealed manual override | 21 Exchangeable push-in fittings |
| | | | 22 Vertical pressure shut-off plate |



MPA-C – the hygienic valve terminal

Perfection in clean design

MPA-C fulfils the most demanding requirements when it comes to cleaning. With its degree of protection IP69K and CRC4, the highest corrosion resistance class at Festo, it optimally withstands cleaning with high pressure and foam cleaning – and it can be used in extremely harsh environments without any problems. Other global standards for MPA-C: FDA-compliant lubricant NSF-H1.

Configuration options

The MPA-C features electrical interfaces on the front or back, with multi-pin plug, fieldbus or Ethernet via CTEU/CTEL. Manual override can be selected as an option and up to 32 pressure zones can be created. The working connection is freely configurable.

Benefits

- Perfect for the food industry thanks to FDA-compliant lubricant NSF-H1
- Excellent corrosion and media resistance for all areas requiring intensive cleaning
- Cleaning-optimised design and matching Clean Design accessories
- Fieldbus/Ethernet thanks to CTEU with Festo I-Port
- Extremely safe: IP69K protection class and redundant sealing system
- Easy to expand thanks to individual sub-bases

Neatly combined: everything in clean design

All components are perfectly harmonised with each other thanks to the clean design: the clean design valve terminal MPA-C, the FDA-compliant tubing/fitting combination NPCK with PFAN, the electrical connecting cables NEBV and standards-based drives such as CRDSNU or DSBF.





The technical data at a glance

	MPA-S	MPA-L	MPA-C
Electrical connection			
Terminal CPX	PROFIBUS DP, PROFIsafe DeviceNet®, CANopen, INTERBUS®, SERCOS III*, POWER-LINK*, CC-Link®, Ethernet/IP, PROFINET, EtherCAT®, front-end controller and others		–
Remote-I/O system CPX-AP-A	PROFINET, EtherCAT®, Ethernet/IP, Modbus®/TCP, IO-Link master, digital and analogue I/O modules	AP-I interface, IO-Link®	IO-Link®
Remote I/O system CPX-AP-I	Intelligent end plate with AP communication input/output	AP-I interface, IO-Link®	IO-Link®
CTEU bus node	–	PROFIBUS, DeviceNet®, CANopen, CC-Link®, EtherCAT®	
Multi-pin	Sub-D 25-pin	Sub-D 9-pin, Sub-D 25-pin, Sub-D 44-pin 34-pin cable clamp, 34-pin ribbon cable	Sub-D 25-pin, Sub-D 44-pin
Miscellaneous	AS-Interface CP installation system	AS-Interface (CTEU fieldbus node)	
Valve functions			
Metal housing, piston spool valve	5/2, 5/3, 2x 3/2, 2x 2/2 special functions		
Polymer housing, poppet valves	5/2, 3/2 special functions		
Valve size/flow rate (max.)			
MPA1 (10 mm)	360 l/min	360 l/min	–
MPA14 (14 mm)	550 l/min	670 l/min	670 l/min
MPA2 (20 mm)	670 l/min	850 l/min	–
Valve coils/positions (max.)			
Fieldbus	128/64	32/32	32/32
Electric multi-pin	24/24	32/32	32/32
CP installation system	32/16	–	–
AS-Interface	8/8	–	–
Sub-base material		Metal	
Pressure range (max.)		-1 ... 10 bar (pressure ranges may be limited depending on the configuration)	
Supply port 1		Tubing diameter (max.)	
Tubing diameter (max.)		10 mm, 3/8"	
Working port 2, 4		Tubing diameter	
Tubing diameter		MPA1	
MPA1		4, 6 mm, 3/16", 1/4"	
MPA14		6, 8 mm, 1/4", 5/16"	
MPA2		6, 8 mm, 1/4", 5/16"	
Additional pneumatic functions		Integrated proportional control valves, pressure sensors	
Soft-start/quick exhaust valves		–	
Pilot air shut-off valves, switching position sensing valve		–	
Manually adjustable pressure regulator, pressure shut-off plate, vertical supply plate		–	
Additional electrical functions		Electrically isolated valves (CPI, CPX), integrated pressure sensor module (CPX)	
Fieldbus		Extended diagnostic function (CPX), condition monitoring (CPX)	
Operating voltage		24V DC ±25%	
Ambient temperature		–5 ... 50 °C	
Degree of protection		IP40, IP65/67**	

* Available soon

** Please note possible restrictions of the IP protection class → ATEX declaration of conformity

*** CRC4: Highest corrosion resistance class according to Festo standard



Electrical and pneumatic functionality

Performance in real time:

MPA-S /-L /-C with modular remote I/O CPX-AP-A

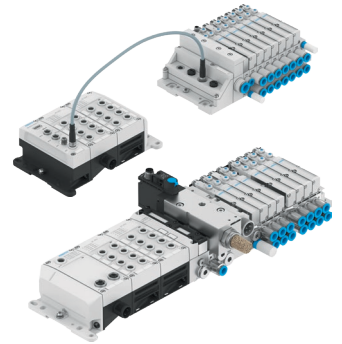
The MPA-S can be connected directly to the CPX-AP-A via its pneumatic interface.

The MPA-L, on the other hand, can be connected indirectly via the AP-I interface with a CPX-AP-A or CPX-AP-I master or bus device or alternatively via an IO-Link connection with an IO-Link master on the CPX-AP-A.

The MPA-C can only be connected via the I-Port in combination with an IO-Link master on the CPX-AP-A. The IO-Link master on the CPX-AP-A can also be used to integrate and communicate with numerous other devices such as electric drives, vacuum generators or proportional valves.

Benefits

- Real-time communication with a data rate of 200 MBaud and a cycle time of up to 250 µs
- Wide range of modules, e.g. digital I/O up to 16-way, in future 32-way
- Analogue inputs, IO-Link master, fieldbus interfaces, etc.
- Protection class IP65/67 for direct installation in the machine
- Decentralised system with a cable length of up to 50 m between the AP participants



Available for:

MPA-S

MPA-L

MPA-C

Performance in the system: decentralised remote I/O system CPX-AP-I

The individual, high-performance I/O modules are either integrated into the higher-level network via the fieldbus module or decentralised connected to the CPX-AP-A via AP communication, and supplemented by valve terminals with AP interfaces and electric drives via IO-Link®.

Benefits

- Very sturdy line topology with up to 80 ultralight and compact modules in one or two lines
- Flexible system design with decentralised I/Os and valve terminals
- Protection class IP65/67 for direct installation in the machine
- Cable length of up to 50 m between the AP participants



Available for:

MPA-L

MPA with fieldbus connection and CPX terminal

The integrated fieldbus node makes both small-scale or large-scale solutions in pneumatics and electronics possible.

Benefits

- Serial internal communication and linking of fieldbus connections with up to 16 sub-bases (128 valves, up to 512 I/O)
- Module for electrical valve actuation with or without galvanic isolation
- Any compressed air supply and any pressure zones are possible
- Digital and analogue I/Os
- Control of electric and pneumatic drives
- Diagnostics and condition monitoring



Available for:

MPA-S

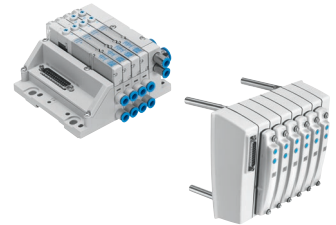
MPA-L

MPA with multi-pin plug connection

For 24 valves/solenoid coils with MPA-S. Even up to 32 valves/solenoid coils (can be mixed) for MPA-L and MPA-C.

Benefits

- 24 V DC actuation
- Cable for energy chains and corresponding IP class
- Any compressed air supply and any pressure zones are possible



Available for:

MPA-S

MPA-L

MPA-C

MPA with fieldbus node CTEU

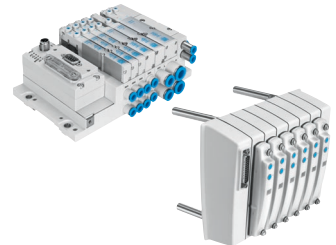
Simply connect and get started: for quickly and directly connecting valve terminals with all common fieldbus technologies.

Benefits

- Intelligent and cost-effective alternative to multi-pin solutions
- Quick and easy connection to the control world
- Basic diagnostics and basic parameters

Scalable into several decentralised installation units

- With CAPC adapter connection of 2 MPA-L or 2 input modules with only 1 bus node
- CPX – CTEL expandable to a small installation system: up to 4 MPA-L or 4 input modules



Available for:



MPA-L

MPA-C

MPA with AS-Interface

For the simultaneous transmission of data and power. The coded cable shape prevents polarity reversal; electrical supply plates are not required. Ideal for widely distributed installations.

MPA-S versions

- With 2 to 8 modular valve positions. For 2 to 8 MPA1 valves or 2 to 8 MPA2 valves, can also be mixed
- 4 or 8 integrated inputs

MPA-C/-L versions

- Fieldbus node CTEU-ASI
- 2 to 16 valves with ASI profile 7.A.7



Available for:

MPA-S

MPA-L

MPA-C



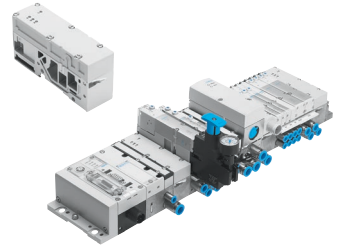
Electrical and pneumatic functionality

Ready to install directly on the fieldbus: MPA pressure sensor

Pressure information via fieldbus communication, via handheld terminal or on-site via LED. Pressure range 0 ... 10 bar.

Benefits

- Can be used for ducts 1, 3, 5 and external pressure without any assembly and installation effort
- The switching points are parameterised in the central control system
- Excellent process reliability thanks to accurate and reliable pressure information
- Static and dynamic process control
- System diagnostics
- Protection against manipulation



Available for:

MPA-S

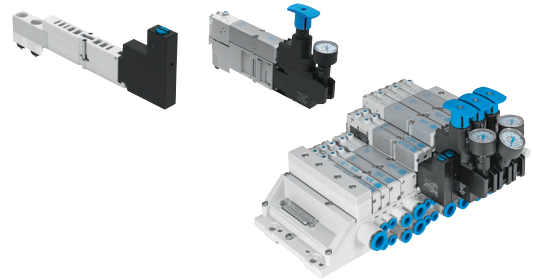


MPA pressure regulator

The force of the controlled actuator can be influenced using a pressure regulator.

Benefits

- Pressure control adjustable on site
- Easy to readjust at any time during the process
- Rotatable, easy-to-read pressure gauges (optional) for monitoring
- Ready to install, no assembly and installation effort



Available for:

MPA-S

MPA-L



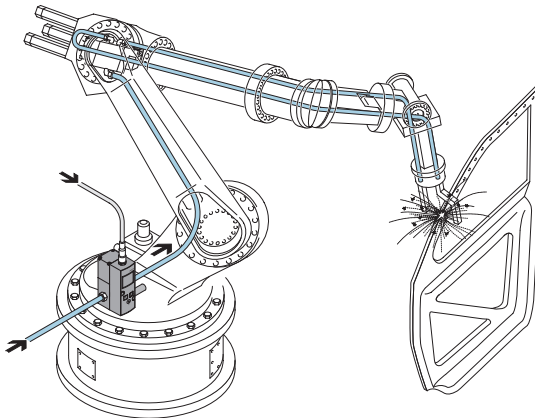
Combined pressure sensing and pressure control with the proportional pressure regulator

VPPM-MPA

Unique in the world: high-precision cascade control enables the pressure to be changed during operation in the range of 0 ... 2, 0 ... 6 or 0 ... 10 bar and with a flow rate of 1400 l/min at the valve.

Benefits

- One valve, variable pressure ranges
- Individual pressure and force control in processes using digitised analogue values
- 3 presets selectable via CPX: fast, universal, precise
- Commissioning via handheld terminal
- Integrated diagnostic functions including remote maintenance, email/SMS alarm, handheld terminal CPX-MMI or CPX maintenance tool



VPPM ensures a precise contact pressure that takes into account the material, processing method and tool.

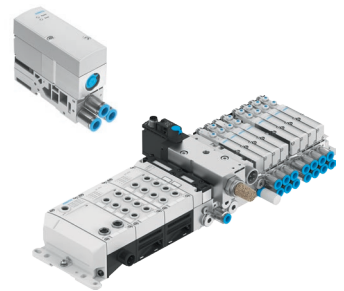
Multiplexing – same functionality with fewer proportional valves

Multiplexing enables up to 8 proportional valves to be saved per pressure zone on one valve terminal. The process is simple: with multiplexing, multiple pressures are sequentially transferred to various actuators through downstream directional control valves. The sequential switching is pressure- or time-controlled.

So only one proportional valve is needed to control up to eight downstream directional control valves on the valve terminal MPA-S, depending on the application and switching frequency.

Benefits

- Significantly reduced system costs
- Less installation effort
- Tested and preassembled module



Available for:

MPA-S		
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Electrical and pneumatic functionality

MPA valve technology

In certain applications, the valve technology can be crucial for a long service life and error-free functioning. That is why the valve series MPA consists of piston spool valves with the patented cartridge principle as well as poppet valves. A brief overview:

MPA spool valve

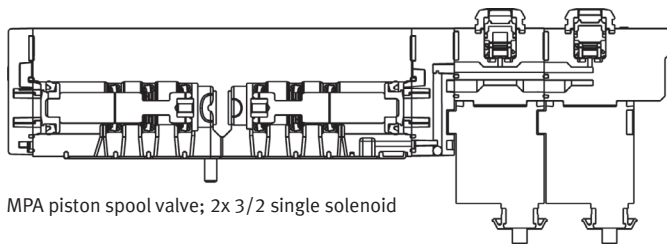
Benefits

- Smaller valves with higher flow rates for reduced costs
- Low leakage
- Reversible – two pressures simultaneously on one valve
- Non-overlapping – reliable separation of the air ducts in dual-pressure operation
- Higher pressures of up to 10 bar for maximum energy density and increased power

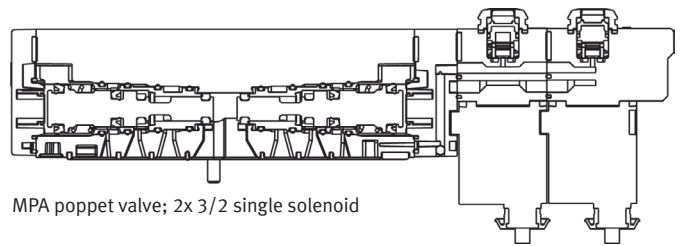
MPA poppet valve

Benefits

- Self-cleaning effect, very sturdy when used with poor compressed air quality
- High chemical compatibility, as no lubricants are required
- Faster switching times thanks to shorter actuation path



MPA piston spool valve; 2x 3/2 single solenoid

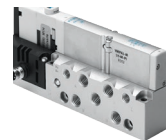


MPA poppet valve; 2x 3/2 single solenoid

MPA with individual connection

For actuators that are further away from the valve terminal, valves on individual sub-bases can

also be used. The electrical M8 connection used is a 4-pin with screw connection.



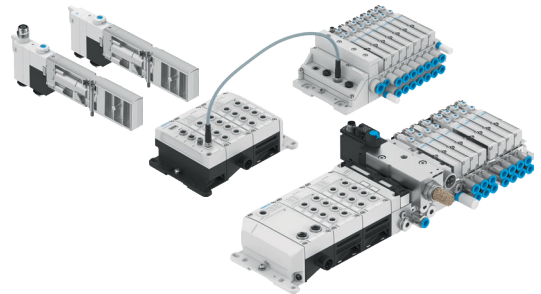
Advantages of safety valves

MPA with pilot air switching valve:

The pilot air switching valve supplies the downstream valves in the pressure zone with pilot air.

Benefits

- The safety function “protection against unexpected start-up” can be realised
- 4 different variants in valve sizes 10 or 14
- Internal and external pressure supply and monitoring possible
- Creation of several pilot air zones through duct separation



Available for:

MPA-S

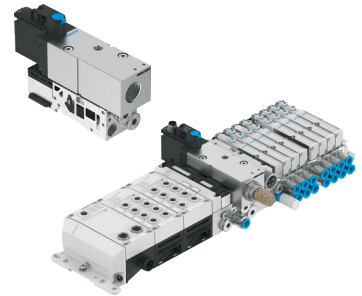
MPA-L

MPA with soft-start/quick exhaust valves

The soft start/quick exhaust valve fulfils two safety functions at the same time.

Benefits

- Fast and safe pressure reduction in the pneumatic system and its drives
- The safety function “protection against unexpected start-up” can be realised
- 4 different variants with either internal or external auxiliary pilot air supply



Available for:

MPA-S

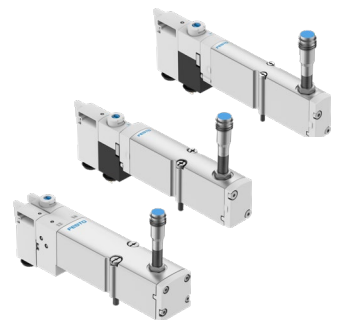
MPA with switching position sensing valve:

A valve with switching position sensing monitors and reports its current position to a control system to ensure reliable process control and greater operational safety.

Benefits

- Increased safety with feedback of the actual switching position of the valve
- Improved process control: precise feedback of the valve position allows processes to be controlled and monitored more accurately.

Overall, pneumatic valves with switching position sensing contribute to reliability and efficiency as well as optimised automation and maintenance in a wide range of applications. Thanks to the modular design of the valve terminal MPA, the customer can easily and simply integrate one or more pressure zones with switching position sensing valves.



Available for:

MPA-S

MPA-L



Festo Automation Suite:

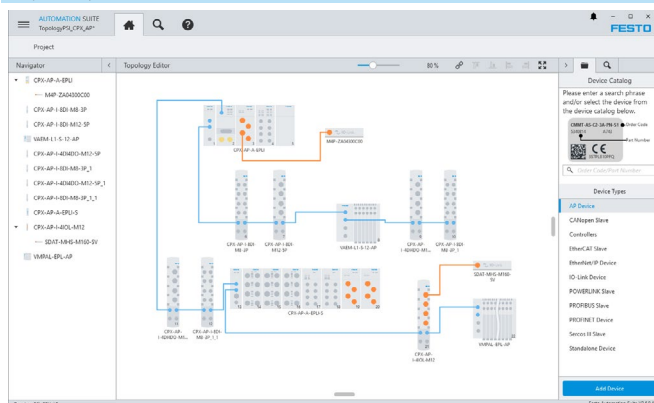
Quick and easy commissioning of CPX-AP-A and -AP-I remote I/O systems

Commissioning complete system topologies with remote I/O systems is quick and easy when using the Festo Automation Suite. The intuitive operation makes configuring and parameterising the topologies effortless. This applies to the CPX-AP remote I/O systems as well as to many valve terminals and IO-Link® devices, such as actuators and sensors, but also to all electromechanical servo drive solutions. Other decisive advantages include:

- Forcing process data without controller and complex programming during commissioning
- Updating the device firmware
- Accessing and downloading the device description files
- Direct access to manuals

- Graphic-based, easy and convenient configuration of the CPX-AP-A remote I/O offline or by online scanning
- Configuration and parameterisation of the entire topology with all participants in the AP string and all IO-Link® devices
- Direct access to device firmware, description files and manuals

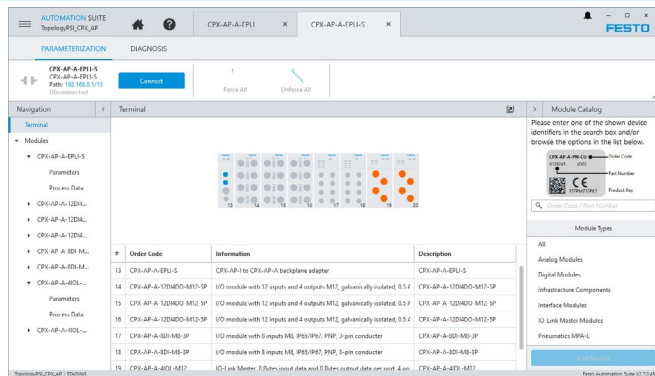
Topology editor



With the Festo Automation Suite, the entire CPX-AP remote I/O topology with valve terminals can be clearly and graphically configured offline in no time at all. The AP modules or valves are added by dragging and dropping from the Device Catalogue/Types on the right-hand sidebar and are automatically connected to the previously selected device, if required. This can be seen in the sample screenshot by the blue line of the AP bus. This not only saves time, but also minimises errors during configuration. In addition, other devices connected to the CPX-AP system, such as IO-Link® devices, can also be easily parameterised.

- Quick and easy configuration and display of the CPX-AP topology and valve terminals
- Exporting the data of the module configuration and parameter settings for control systems
- Overview of the device status in online mode
- Parameterisation of connected IO-Link® devices such as electric drives from the Simplified Motion Series, sensors, the vacuum generator OVEM, or pneumatic proportional valves VPPM, etc.

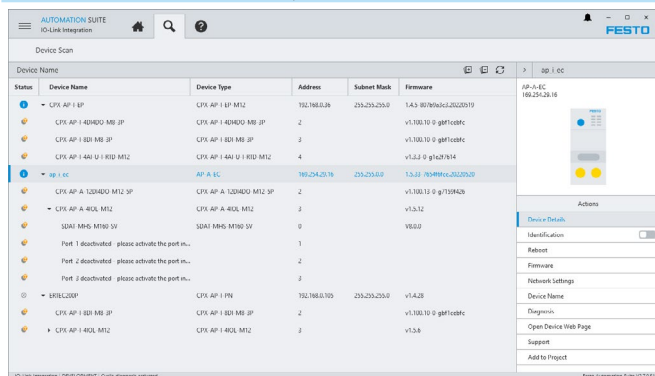
Configuring the CPX-AP-A terminal



CPX-AP-A terminals can be configured using graphics, and modules can be moved, deleted or inserted. Process data can be forced directly in the plug-in during pre-commissioning in order to check the I/O. This can all be done without a controller and complex programming.

- Convenient configuration of the CPX-AP-A terminal using a graphics-based configurator
- The module parameters can be set quickly on the parameter pages
- Monitoring and forcing of process data during commissioning via I/O check
- Reading out diagnostic messages

Scanning the AP-A and AP-I system



In the online scan view, the Festo Automation Suite recognises connected devices and displays them in the listed order. The network settings of the devices can be adjusted on the page. In addition, the scan view allows the firmware for the CPX-AP modules to be updated and provides access to product-specific manuals and device description files via the "Support" tab. In the scan view, you can also easily import connected devices into the project. This increases efficiency when setting up and configuring automation systems.

- Convenient, multi-stage scan of all connected devices (complete topology)
- Comparison of the target and actual configuration of the entire topology line of the CPX-AP
- Transferring the imported devices to the project
- Updating the device firmware and downloading the device description files

Online configurator



Download the Festo Automation Suite free of charge now

- PC-based software
- Intuitive and user-friendly design
- Clearly structured with graphical user interface
- Download free of charge now

