

**Biotech, pharma and cosmetics industry**

**FESTO**



You are looking for a partner who understands your objectives.  
You require more efficient production facilities.  
We are your solution for automation.

→ **WE ARE THE ENGINEERS  
OF PRODUCTIVITY.**



**Automation solutions ...**

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... for the control level

... for the field level

## **Greater flexibility and efficiency in biotech, pharma and cosmetics production**

The production of pharmaceutical and cosmetic products requires complex technologies and a very high level of automation. This is the only way to achieve greater flexibility and agility in production and meet the increasing requirements of regulatory authorities, even under increasing cost pressure. What you need in these circumstances is a technology partner that understands your business.

### **Our contribution: giving you a competitive edge through industry-specific automation**

Consulting and engineering services, intelligent design tools, systems, modules, innovative products, training and services from Festo help you to realise modular, flexible and scalable automation concepts. Along your entire value chain, from raw materials storage to API production and formulation to filling, packaging and palletising. From start to finish and tailored to your needs.

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... for filling and packaging

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... for compressed air supply

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... in laboratory processes

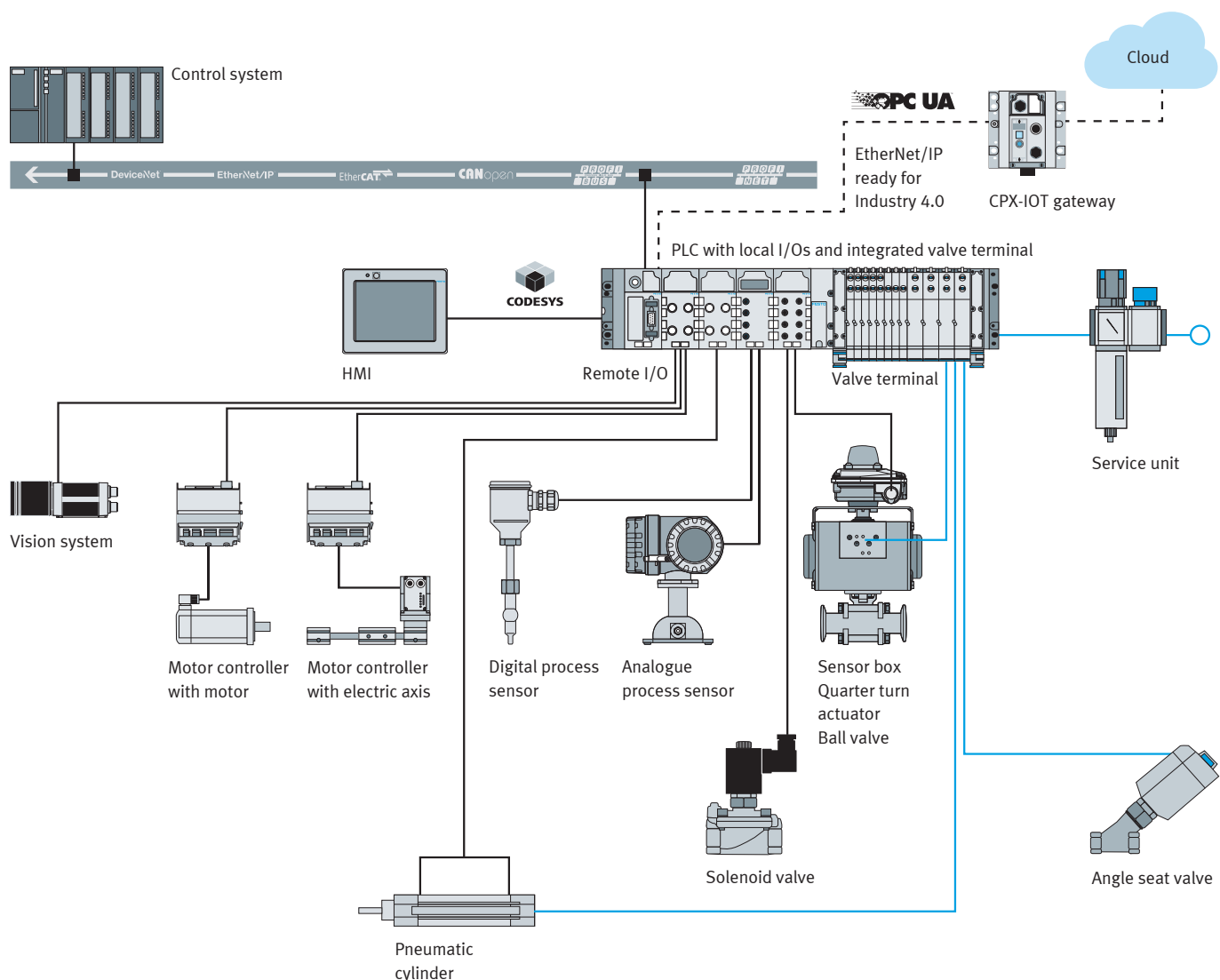
## PLCs, valve terminals and remote I/Os

Festo's core competency is its ability to offer valve terminals as a globally established standard to control pneumatically actuated process valves and linear actuators. They combine compact design, low installation costs, high functionality and reliability in one product. And they have been proven in operation. Together with the highly integrated automation platform CPX and our PLCs, you can automate complete machines or skids, both electrically and pneumatically.

The automation platform CPX includes PLCs, motion controllers, bus nodes and compressed air sensors as well as digital and analogue inputs and outputs for actuating field devices. The complete solution can be programmed using the open source

software CODESYS, which comes with a considerably lower licence cost model than comparable offerings. Together with a touch panel CDPX, this makes operating your machines child's play.

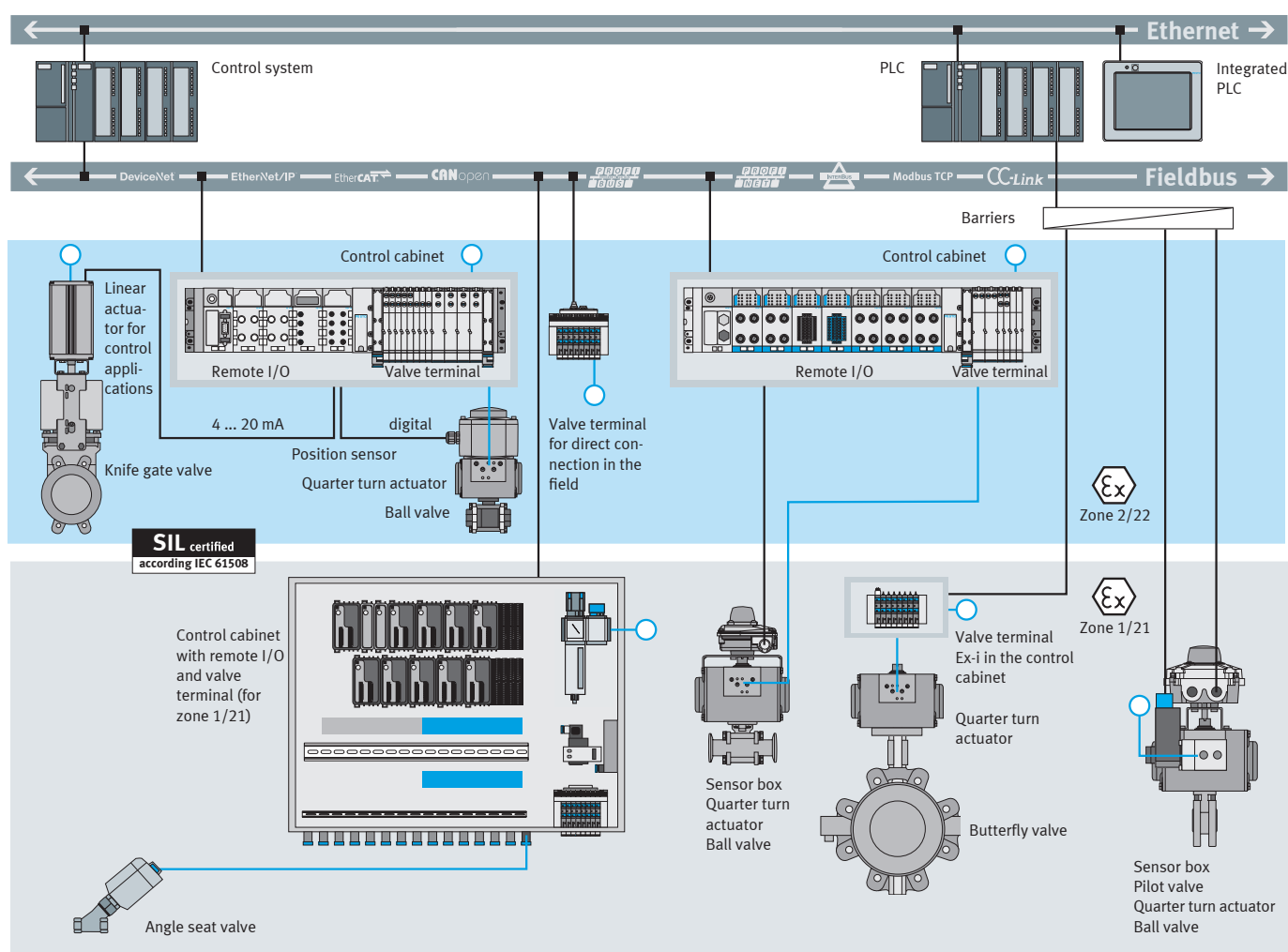
### Automation solutions for machines, skids, and parts of process plants



# Solutions for potentially explosive areas

Pneumatic actuators from Festo can be used in zones 1/21 and 2/22. Valve terminals, pilot valves, remote I/Os and other electric devices are normally available for zones 1/21 or 2/22. To precisely understand your requirements for explosion prevention and protection, we discuss the potential solutions with you and choose those that meet your needs. The right concept will protect your system and your employees, ensure reliable operation and reduce purchasing and operating costs.

## Automation solutions for potentially explosive areas

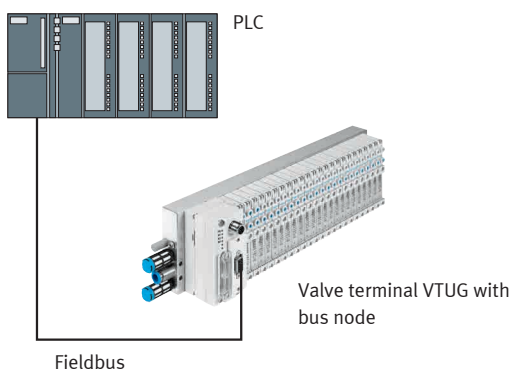


## Centralised or decentralised – the choice is yours

Do you want to realise a small decentralised PLC with HMI, integrated remote I/Os and connected valve terminal? Or perhaps connect a fully pneumatic valve terminal to a central control system? You will find everything you need at Festo: fieldbus systems (simple bus connection, ring and system redundancy), Ethernet, IO-Link®, for direct connection as well as master/slave installation. It makes no difference to us whether you are connecting just one or several valve terminals with one fieldbus address. The important thing is that the solution meets your requirements.

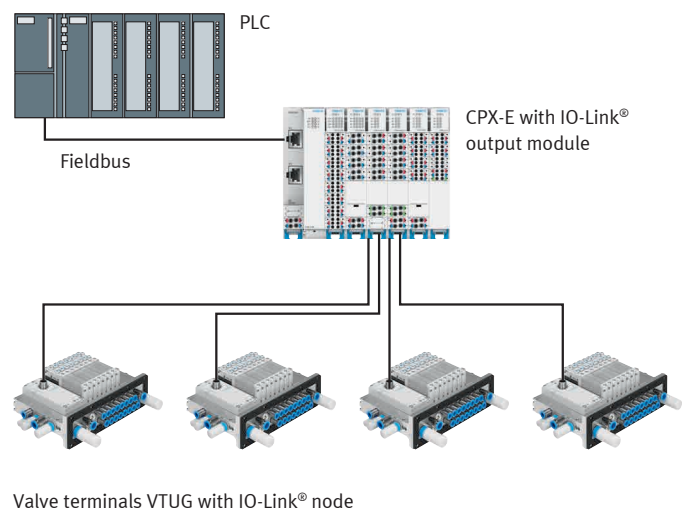
### Direct connection to PLCs

One fieldbus address per valve terminal

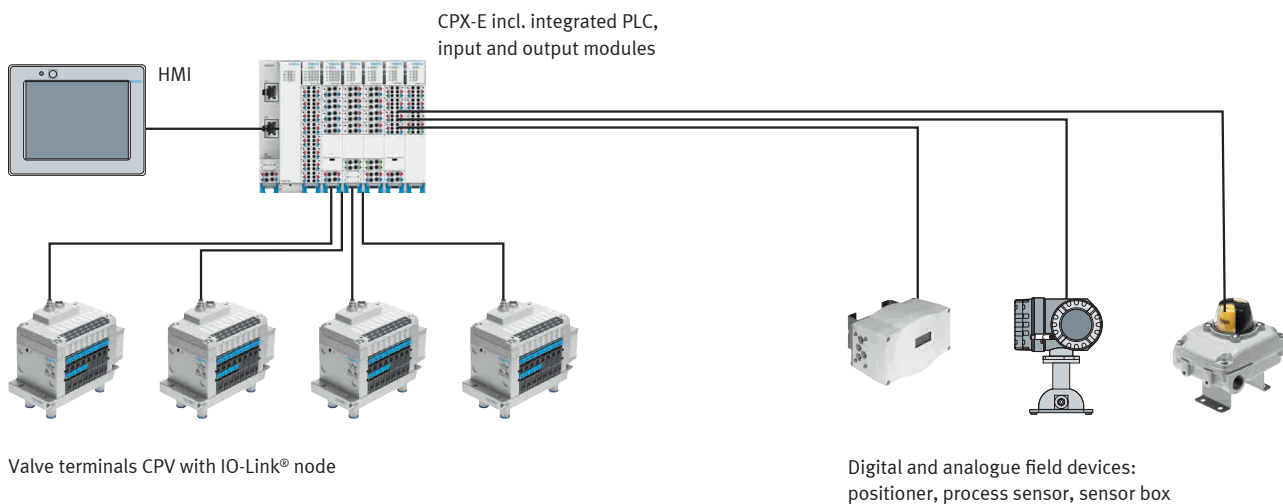


### Automation system CPX-E with 4-way output module

4 valve terminals with one fieldbus address



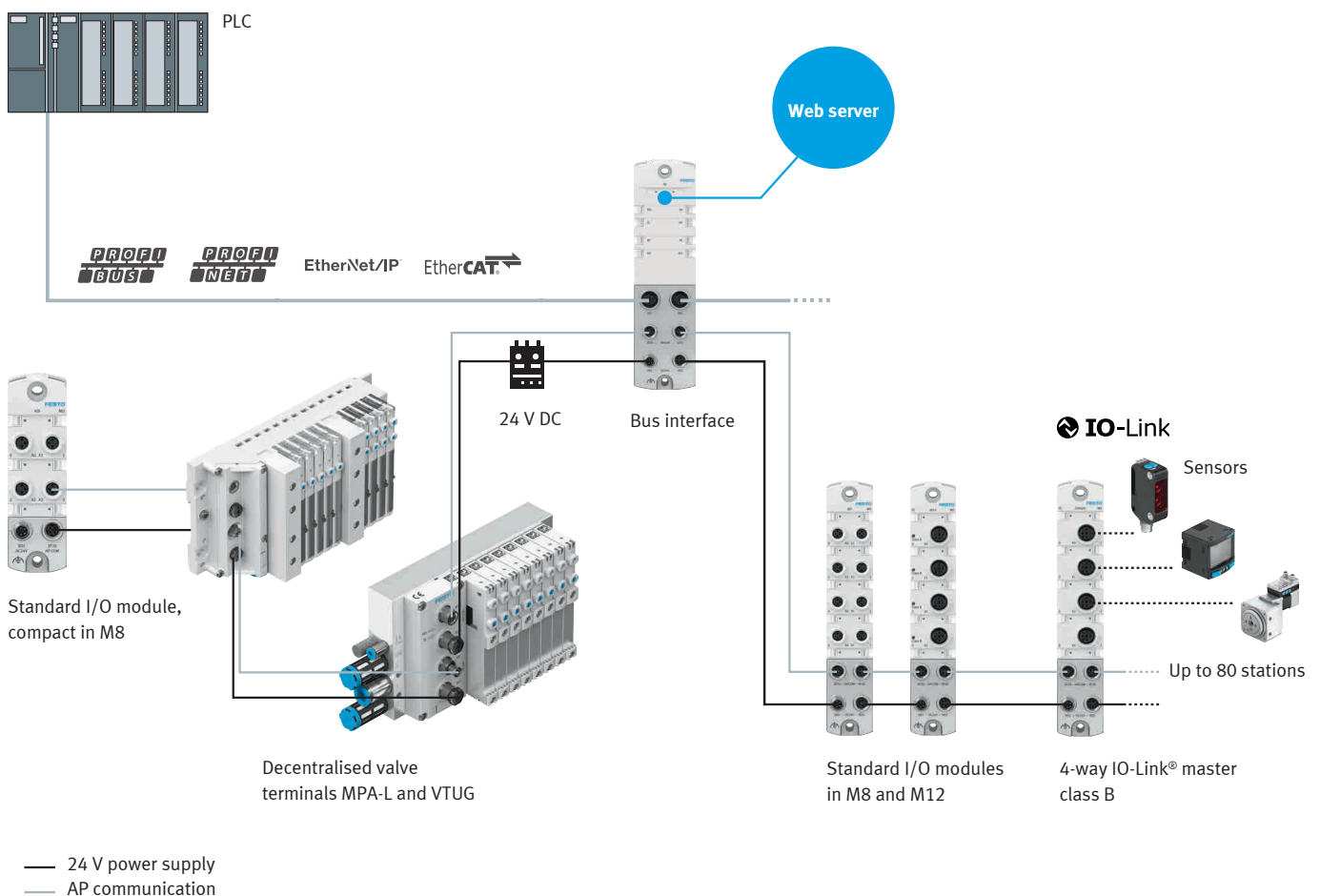
### Complete control system concept



# Flexible and powerful open systems

The AP system from Festo is the new communications technology that will enable all Festo products to be networked together in the future and prepare them for digitalisation. CPX-AP-I is the first of the new generation of the CPX automation platform. The IP65 system consists of a bus node, IO-Link® module and input and output modules. It can be used centrally in a control cabinet or decentrally in the field. This opens up a completely new degree of automation freedom for you and your machines, skids and systems.

## Sample installation of a CPX-AP-I system

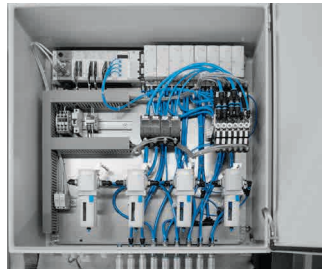
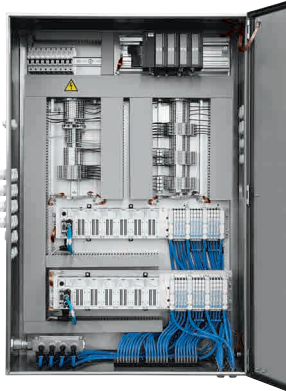


### AP system at a glance

- Open system, can be integrated into all PLCs commonly found on the market
- Fewer bus and interface modules required
- Fast communication at up to 200 Mbps
- In synch with the host PLC
- Ring and S2 redundancy for Siemens PCS7 and other control systems

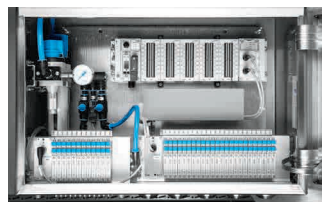
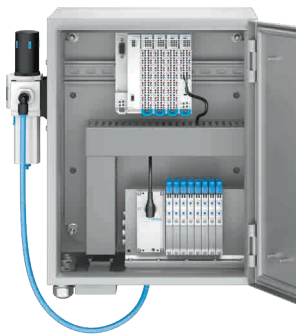
## Complete valve terminal cabinets – standardised and customised

We make an important contribution to more efficient validation and long-term process reliability with our standardised and customised control cabinets in the clean area or technical area. Whether you are implementing one-off production or major international projects with several hundred cabinets, we take care of engineering, assembly, documentation and delivery – everything from a single source.



### Electropneumatic control cabinet

- Centralised installation of up to 128 valve slices per valve terminal
- Maximum design flexibility
- Supports the integration of many functions, e.g. vacuum, proportional valves, etc.
- Comprehensive diagnostic functions such as wire break, short circuit, single-channel diagnostics

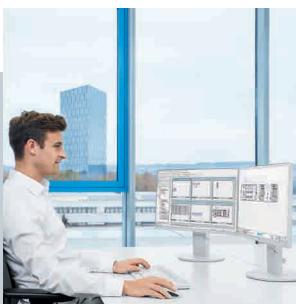


### Control cabinet with valve terminal in the control cabinet wall

- Valve terminal with pneumatic multipin connector plate for direct installation in the control cabinet wall
- Simple, space-saving and cost-optimised installation
- Pneumatic hot swap (replacing valves during operation)
- Pneumatic interfaces outside the control cabinet possible
- Decentralised installation, ideal for modular automation

### The benefits to you

- Complete documentation as a download to EPLAN – for flow and circuit diagrams in five minutes instead of two days
- Contact partners who understand industry-specific standards and documentation requirements
- Real simplification of validation, training, operation and maintenance through standard control cabinets



### Designing and documenting circuit diagrams with EPLAN macros

Manually documenting complex products like valve terminals is time-consuming and prone to errors. Our web service tool available in the Festo App World simplifies and speeds up this process. It generates a configuration-specific EPLAN project from a product's order code.

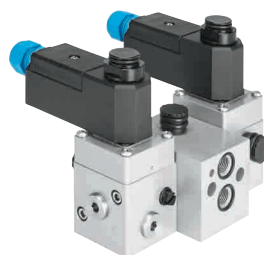
→ [www.festo.com/eplan](http://www.festo.com/eplan)

## Safety-related actuation of process valves

Process reliability and availability are fundamental prerequisites for planning, approving and operating systems. This is generally achieved through a combination of appropriate sizing and extremely reliable and tried-and-tested components. Our numerous automation solutions enable installation to SIL 2 and SIL 3 (IEC 61508).

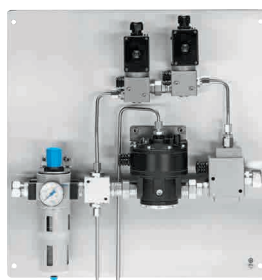
### Redundant NAMUR block (1oo2 & 2oo2)

The NAMUR block enables two solenoid valves VOFC or VOFD to be installed directly on the quarter turn actuator. The NAMUR interfaces make redundancy easy to implement. The advantages are low warehousing costs and easy replacement of solenoid valves.



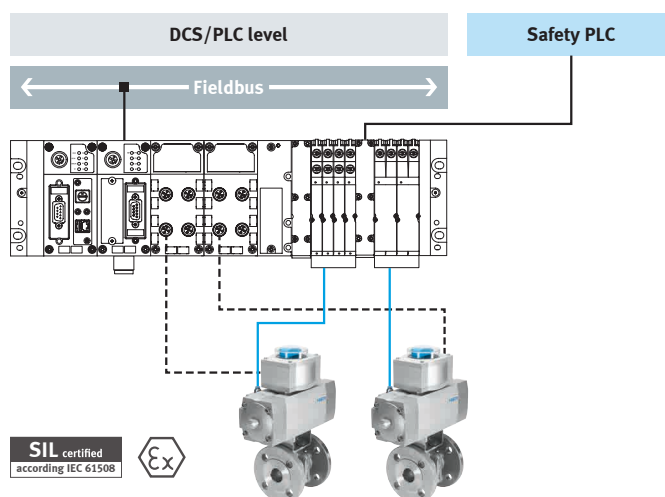
### Control cabinet solutions for safety-related actuation of process valves

Ready-to-install solutions in a control cabinet or on a mounting plate. We take care of planning, engineering, assembly, function testing and delivery. Everything from a single source.



### Valve terminal CPX-MPA with integrated safety shutdown

In operation, the valve terminal is actuated by the control system via a fieldbus and switches the actuators in the process. In addition, the valve terminal has a separate supply to the safety PLC. Individual valves on the valve terminal are actuated via this channel for the safety shutdown. This solution is suitable for SIL 2 circuits. To increase the safety level, the valves can be interconnected redundantly.

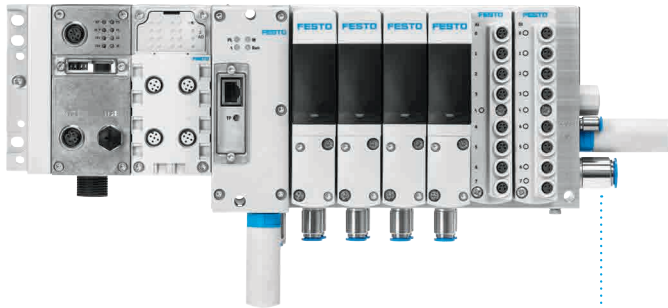


The examples shown above are just a small selection of the possibilities we offer. You can find more about this in our brochure “Functional safety in the process industry” on the Support Portal:

→ [www.festo.com/supportportal](http://www.festo.com/supportportal)

# Digital pneumatics – Festo Motion Terminal

The Festo Motion Terminal VTEM is the world's first valve to be controlled using apps. Our Motion Apps allow you to integrate many functions using standardised hardware; functions can simply be switched at the touch of a button. Thanks to comprehensive diagnostics, condition monitoring and improved maintenance, productivity is increased and production complexity is reduced.



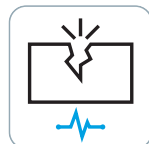
## Flexibility and standardisation go hand in hand with our Motion Apps

The Festo Motion Terminal offers benefits along the entire value chain, from the conceptualisation to the modernisation of your system. The Motion Apps are an integral part of this, since they allow you to standardise your applications while offering unparalleled levels of flexibility. Currently, there are 10 apps. We would like to draw your attention to two of them, as they are particularly interesting for system builders/operators:



### Save compressed air – with large actuators and high switching cycles

The actuator is operated with the minimum pressure needed for the load. There is no rise in pressure in the actuator chamber at the end of the movement. Compressed air savings of up to 70% are possible.



### Detect and locate malfunctions in specific actuators: leakage diagnostics

Thanks to separate diagnostic cycles and defined threshold values, malfunctions can be detected and localised with the Festo Motion Terminal for specific actuators. This allows you to always keep track of large systems, and you also know at any time, whether, and if so, which actuator is malfunctioning.



You can find out more about VTEM in our Festo App World:  
→ [www.festo.com/appworld](http://www.festo.com/appworld)

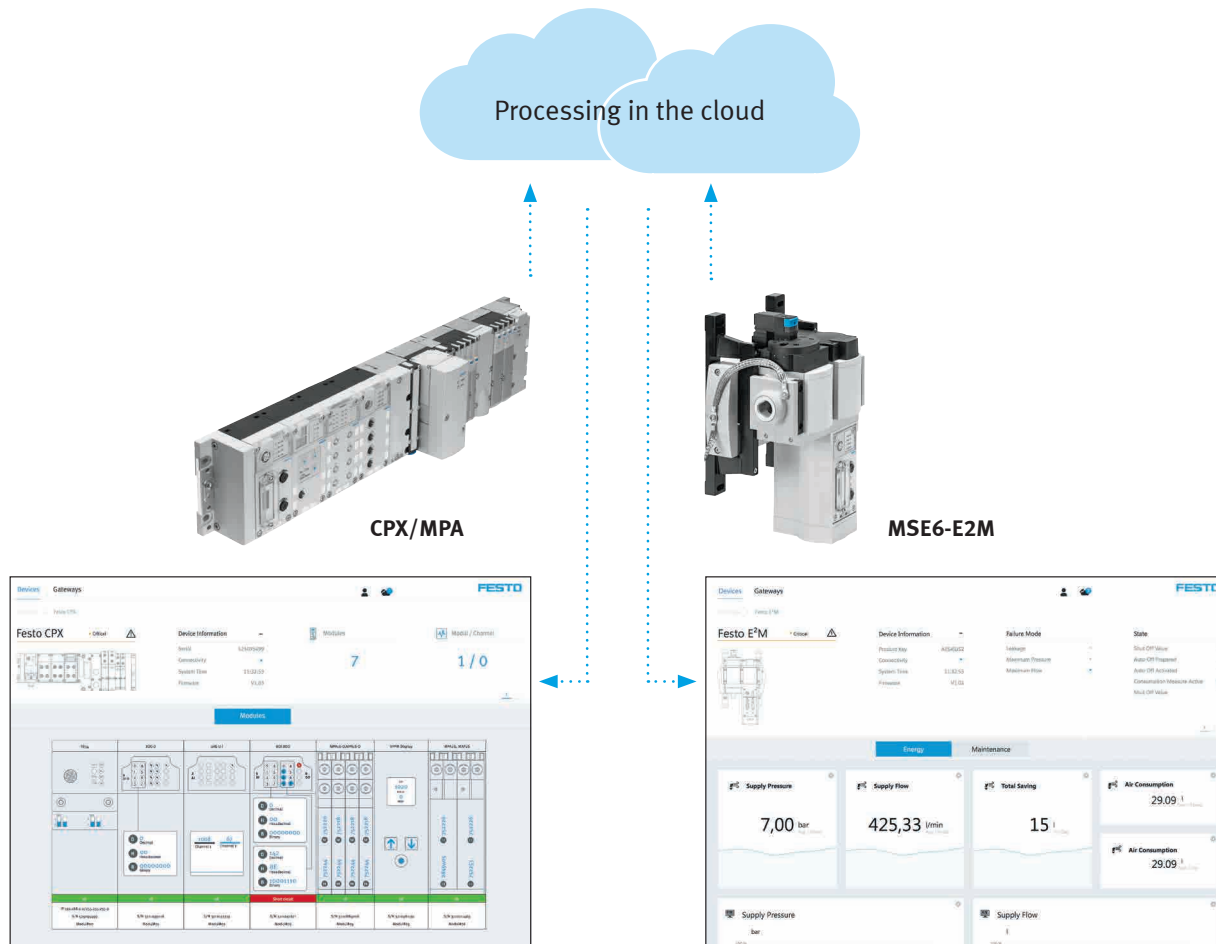
## VTEM is a platform full of possibilities – just ask us about it!

The opportunities offered by the Motion Terminal are far from being exhausted. One of our specific goals is to develop new apps that are tailored to your needs. We have already developed concepts for optimising the opening/closing characteristics of process valves or

for detecting the end position without using sensors. You too can benefit from this continuous development by telling us your requirements – we look forward to receiving your ideas!

## Greater transparency with networked components and cloud services

With Festo you can easily and quickly get started with the Industrial Internet of Things (IIoT). Information about Festo devices and their statuses is available worldwide at any time. What this means for you is increased productivity through better utilisation, lower costs through better energy efficiency and fewer downtimes thanks to comprehensive diagnostics, condition monitoring and improved maintenance.



### CPX/MPA

The dashboard shows an exact digital image of your individual configuration. You can immediately detect operating statuses, receive error messages in plain text and track valve switching cycles as well as the status of the inputs/outputs live. Retrospective analysis of process data for up to one year is possible.

### MSE6-E2M and MSE6-C2M

Energy consumption is monitored and documented in the dashboard. For every system that is supplied with compressed air via an MSE6 module, you can view the pressure, flow rate, consumption and changes in pressure at any time. This allows you to identify possible leaks, carry out preventive maintenance and reduce downtimes.



### Process data analysis and troubleshooting with Festo Dashboards

Festo Dashboards for condition monitoring make it easier for you to monitor the condition of your system, identify anomalies in good time, optimise machines and systems and better plan your maintenance work.

→ [www.festo.com/dashboards](http://www.festo.com/dashboards)

## Easy automation of process valves

Automating process valves reliably and efficiently poses significant challenges for operators of large systems, as they often use thousands of process valves from different manufacturers. In these cases standardisation is a must. It is the only way to keep an overview and ensure the costs for operation, service and maintenance are acceptable. To achieve this, you need a partner who not only offers a comprehensive and top-performing product portfolio, but also impressive services.

### Large selection of process and media valves

The design and materials of Festo components meet the requirements of the pharma and cosmetics industry.

Our range includes:

butterfly valves, ball valves, angle seat valves, electrically actuated media valves, pinch valves



Angle seat valve VZXA



Pinch valve VZQA  
(normally open)



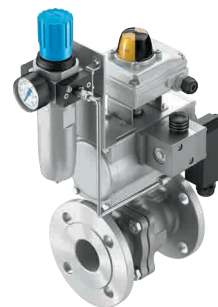
Pinch valve VZQA  
(normally closed)

### Automated process valves

Fully automated butterfly valves and ball valves greatly simplify planning, purchasing and commissioning and save costs. Festo offers you a portfolio of compatible components and solutions.



Butterfly valve unit KVZA



Ball valve unit KVZB with  
filter regulator LFR-...-EX4



Automated ball valves  
VZBM

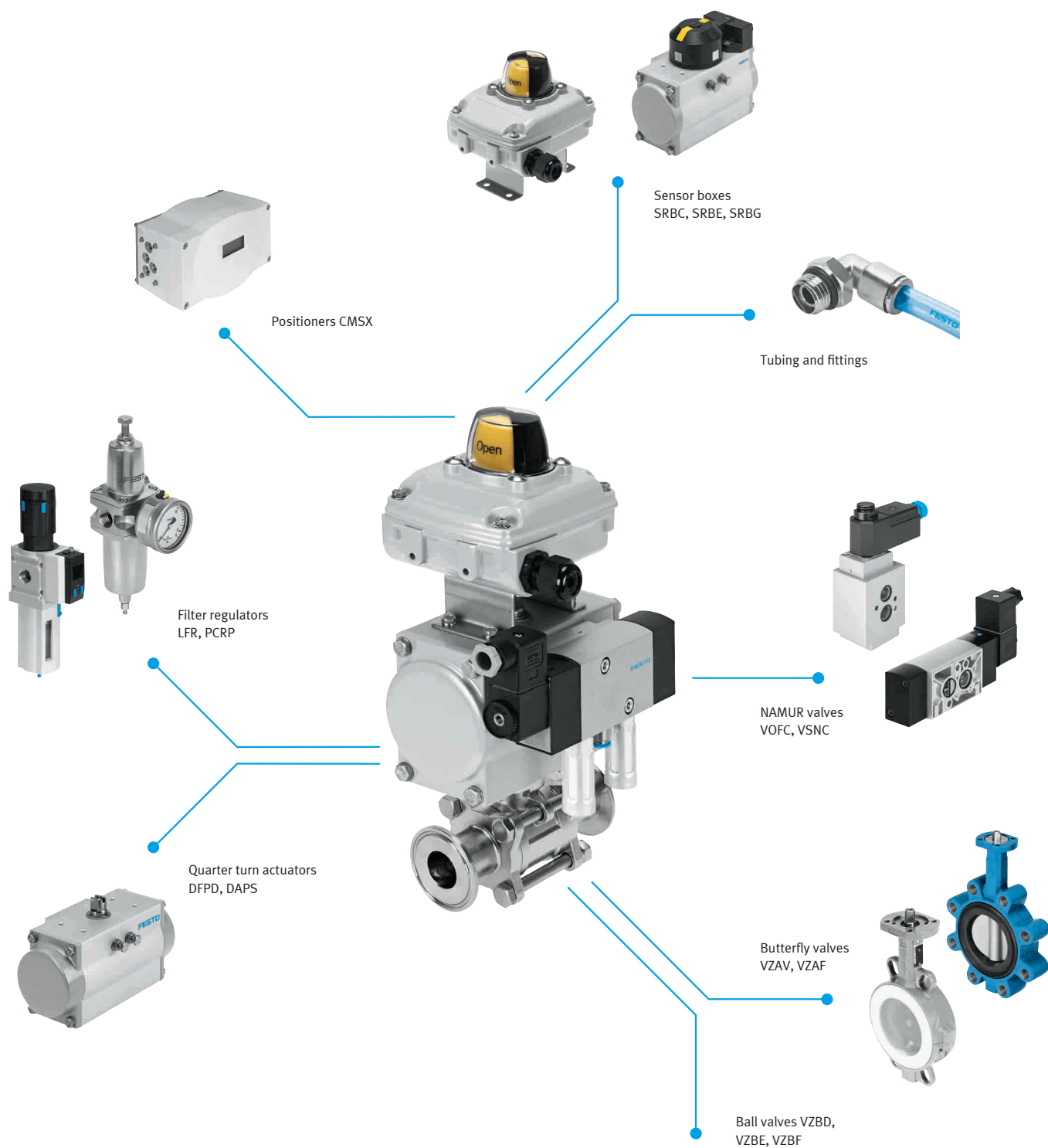


### Finding the right automated process valve quickly and easily

Festo offers manual or fully automated process valves from a single source, including configuration-specific CAD data and documentation to download.

Configure automated ball valves here → [www.festo.com/kvzb](http://www.festo.com/kvzb)

Configure automated butterfly valves here → [www.festo.com/kvza](http://www.festo.com/kvza)



### Explosion prevention and protection

- Products and components for potentially explosive areas for zone 0, 1, 2 as well as 20, 21, 22
- Various international and national certifications are available



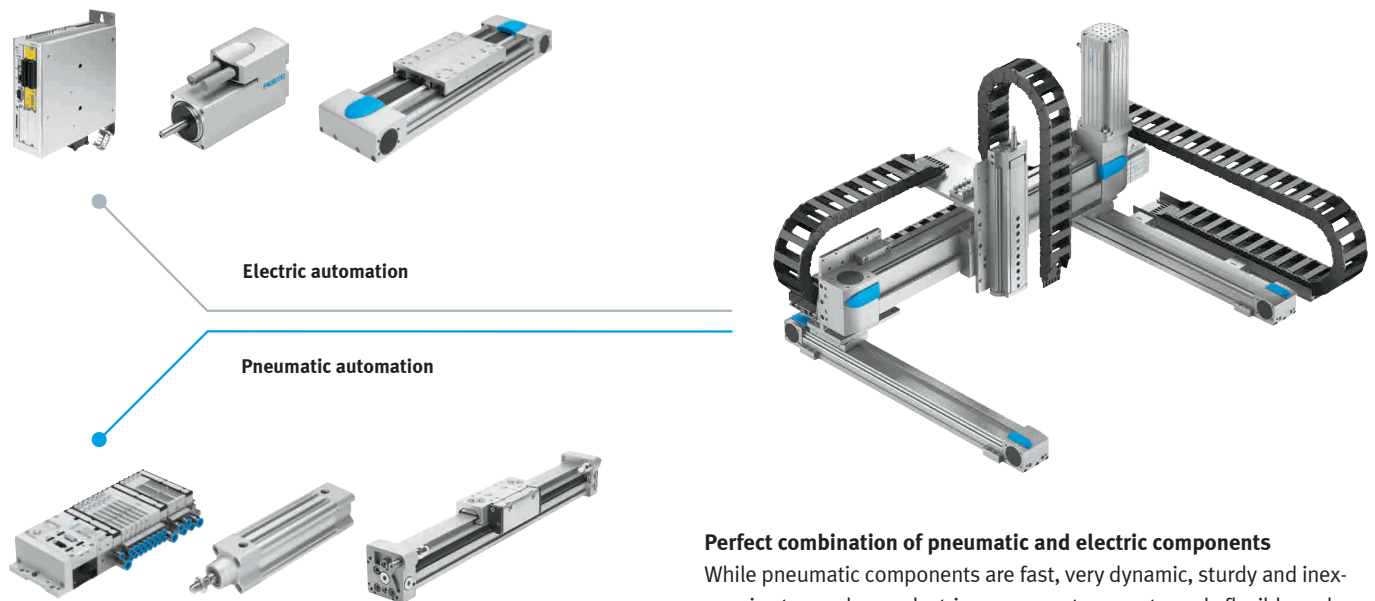
### Safety integrity level (SIL)

- SIL-rated components up to SIL 2
- Can be used up to SIL 3 in redundant design



## Maximum flexibility for filling and packaging

Having a large variety of products in small batches requires maximum flexibility and minimum times for product changeovers. You can now have the best of both worlds and get closer to your goal than ever before. Because the optimum combination of pneumatic and electric automation enables product changeovers without losing any time. Intelligent automation concepts and the innovative Multi-Carrier-System (MCS®) give you a real competitive edge.



### Perfect combination of pneumatic and electric components

While pneumatic components are fast, very dynamic, sturdy and inexpensive to purchase, electric components are extremely flexible and precise in operation. Not only do they make it possible to travel to any intermediate position, but settings and parameters are saved in the machine PLC and can be called up by product at any time. There is no need to configure or readjust the hardware. High-performance cameras and scanners also help you to integrate automated quality control.

More about handling systems: → [www.festo.com/handling](http://www.festo.com/handling)



### Configuration and ordering platform Handling Guide Online

Pre-assembled and configured subsystems from Festo are the perfect combination of both worlds and are easy to integrate into standard PLCs. This unique online engineering tool from Festo helps you to configure and order your handling system. It minimises your engineering time and effort and guides you to the right solution in record time.

→ [www.festo.com/handling-guide](http://www.festo.com/handling-guide)

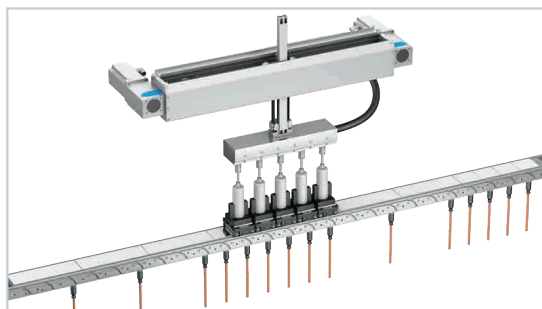
The wide range offered by Festo enables you to choose the handling system that is most suitable for you. Applications range from small parts assembly (e.g. for inhalers, insulin pens and lipsticks) to filling, capping and packaging medications, cosmetics and body care products to palletising. We support you in every phase of your project with ready-to-install systems, integrated software and services.

### Filling and packaging

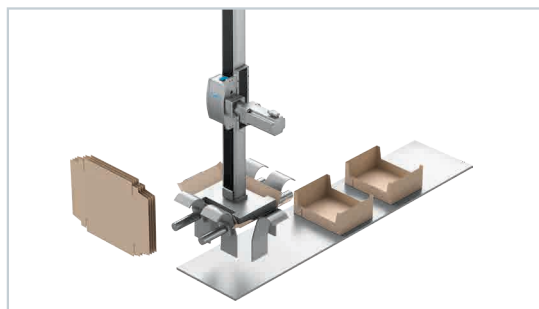
The Multi-Carrier-System MCS® from Festo offers ready-to-install subsystems for your filling and packaging lines. They can be freely configured and are perfect in combination with conventional conveyor systems and handling technologies.

Automation solutions from Festo master every task, whether erecting trays, closing cardboard boxes or highly dynamic palletising. All thanks to sturdy axes ELCC and EHHM for heavy loads.

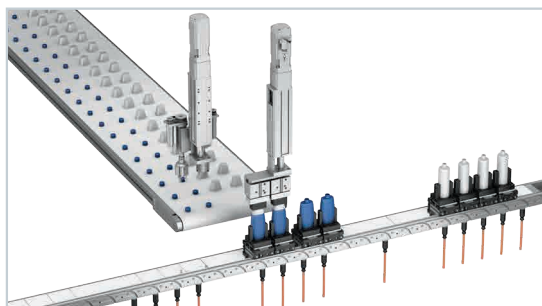
#### Filling



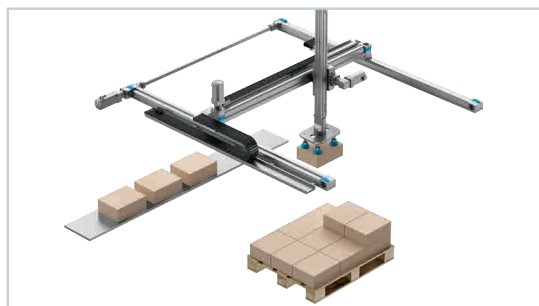
#### Cartoning



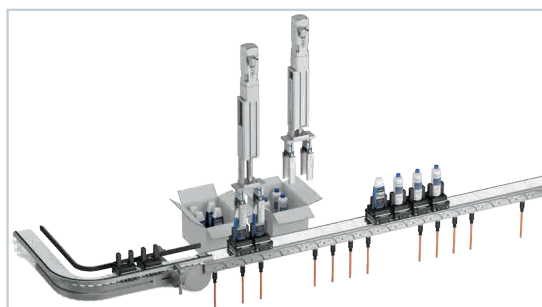
#### Capping



#### Palletising



#### Packaging



#### The benefits of Festo solutions to you

- Greater system flexibility
- Shorter product changeover times
- Higher output per unit of time
- Reproducible results through saved parameters
- Format changes at the push of a button

## Compressed air – invisible, but indispensable

The importance of compressed air supply and the control of gases for production plants is often not recognised until poor design results in problems. Chips in valves due to a lack of filters or rusty water in a mass flow controller as a result of inadequately dried compressed air can easily bring production to a halt. Look after your core processes and let Festo help with your compressed air supply.

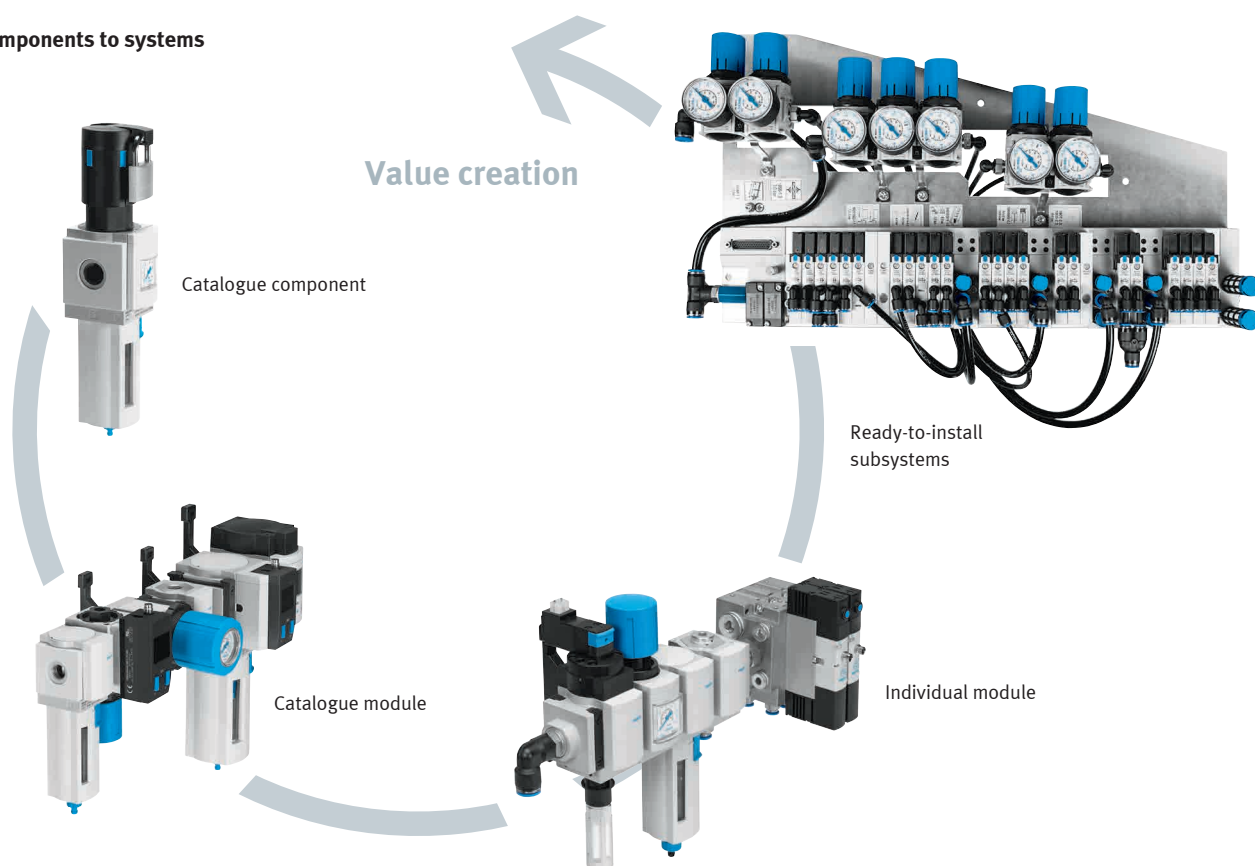
### Service right from the beginning

As a strong partner for everything related to decentralised compressed air supply, we make sure that all consumers in your production are provided with the correct amount of compressed air in the correct quality and with the optimal operating pressure. Take advantage of our expertise: Festo designs and delivers integrated solutions, from individual devices to finished mounting plates to complete gas supply cabinets.

### Compressed air distributors, fittings and tubing

Festo offers you suitable components to make sure that compressed air makes it to where it is needed in the field: fittings in polymer, nickel-plated brass or stainless steel for technical areas, clean areas or outdoor use. Tubing with standard outer diameters in a wide range of materials, compatible with our fittings – hydrolysis resistant, chemical resistant, temperature resistant, FDA-compliant or all of the above. Compressed air preparation and distribution and LOTO manual on/off valves for maximum safety during servicing and maintenance work.

### From components to systems



### Controlling inert gases in the process

Festo service unit components and proportional valves are ideal for controlling the pressure and flow rate of inert gases like air, nitrogen, argon and carbon dioxide, whether directly in the process device or

for supplying slide ring seals in agitators and mixers. We can create individual solutions ranging all the way up to complete gas supply cabinets for you.

Compressed air has a bad reputation. Many consider it to be an expensive form of energy. The calculations of the past that underly this reputation neglect the technical progress made in recent decades, which has significantly reduced the energy required to generate compressed air. Modern monitoring at the point of use paired with intelligent pressure reduction and integrated leakage monitoring reduces losses during operation and provides early warnings about wear to the pneumatic components. This protects your systems against unplanned downtimes and lowers your operating costs.

The **MSE6-E2M**, **-D2M** and **-C2M** modules automate energy saving in compressed air and gas supply systems. The intelligent modules fully automatically monitor and regulate the compressed air supply in your systems. They are connected to the cloud via the IoT gateway and the

libraries integrated within it. Preconfigurable dashboards that can be integrated in various cloud solutions and machine PLCs visualise your data without the need for any programming.

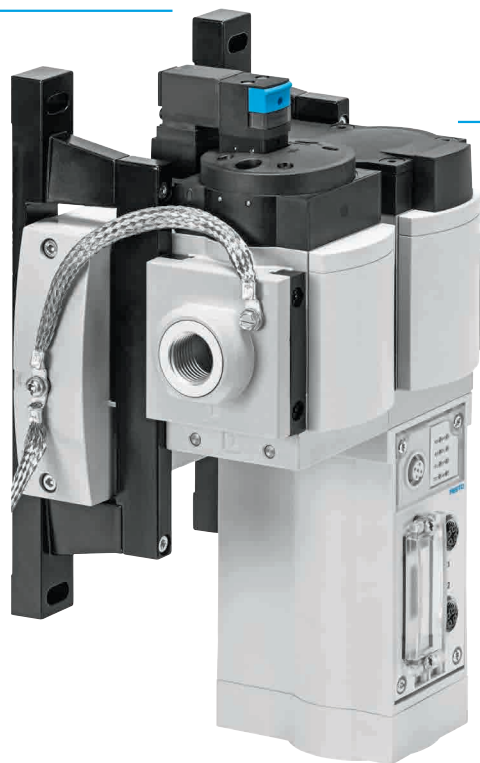
#### Leakage measurement

When the compressed air supply is shut off, the module checks the system for leaks and shows any changes.

#### Big data – statistical data evaluation

Our subsidiary Resolto specialises in analysing large amounts of data. Using the AI and ML algorithms from SCRAITEC, you know about possible changes to your machines and systems in advance and can prevent possible machine failures.

→ [www.scratec.com](http://www.scratec.com)



#### Condition monitoring and system monitoring

An energy management system according to ISO 50001 requires all air consumption and savings to be recorded for all machines. Our energy saving modules continuously provide you with the relevant data for this.

#### Standby? Decrease the pressure or shut off the compressed air!

If the module detects a standby status, the pressure is automatically lowered or the compressed air supply is shut off.



#### Keep track of everything

For every system supplied with compressed air by one of our modules, you can view the pressure, flow rate, consumption and changes at any time. This allows you as a system operator to identify possible leaks, compare several systems, carry out preventive maintenance and reduce downtimes.

Find out more: → [www.festo.com/dashboards](http://www.festo.com/dashboards)

## Laboratory automation – dynamic motion and precise dosing

High-throughput screening in a laboratory is crucial for the efficient development of active ingredients, processes and formulations for medications and body care products. Our handling solutions, grippers and camera systems move and identify your samples and sample carriers precisely and reliably. That is why we have developed innovative solutions and ready-to-connect subsystems.



### Handling in the smallest of footprints

Our three-axes solutions permit fast transport and precise motion control of product carriers and test containers. And with our planar surface gantry EXCM, it all fits on a lab bench. Apart from the motion itself, we also integrate other functions into our solutions:

- Automatic identification of test tubes, vials and microwell plates using bar code readers
- Opening and capping of sample vials and reaction vessels using grippers as well as handling and decapper modules
- Reliable dispensing of liquids using pipetting and dispensing systems

### Kinematics for sample handling

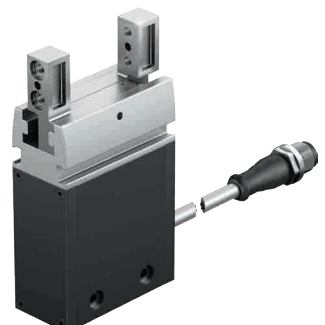
Planar surface gantry EXCM



Rotary gripper module EHMD



Electric gripper EHPS



Our dosing valves and multiple dispense heads measure out liquids in milliseconds, either in the microlitre range ( $\mu\text{l}$ ) on microwell plates or in millilitres (ml) for small fermenters and reaction vessels. Together with the high-speed handling system, we speed up your product development and guarantee your results are reproducible.

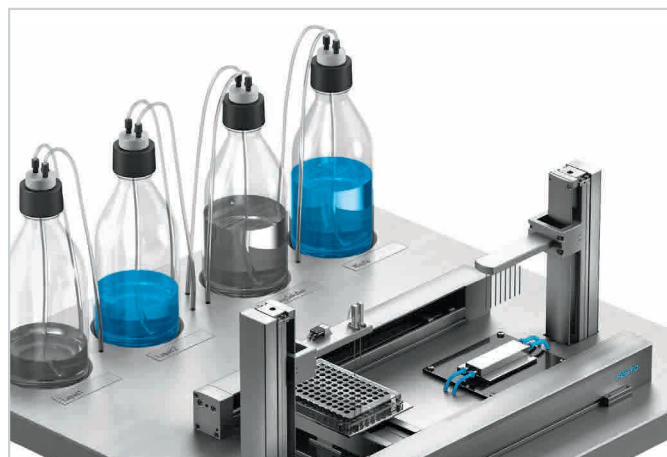


#### Dispensing very small amounts of liquid

Once the product carriers and test vessels have been lined up and opened, the dispense head must be positioned quickly and precisely. Our compact, ready-to-connect three-axis manipulators ensure contactless dosing in the  $\mu\text{l}$  or ml range – continuously or time controlled.

More about automation solutions for laboratory processes:

→ [www.festo.com/lab](http://www.festo.com/lab)



- Highly precise and reproducible flow control
- Single-channel or multi-channel control with up to 16 channels
- Operating pressure:  $<1$  bar
- Response time:  $>1$  ms
- Minimum target volume:  $1 \mu\text{l}$

#### Controlling and proportioning liquids and gases

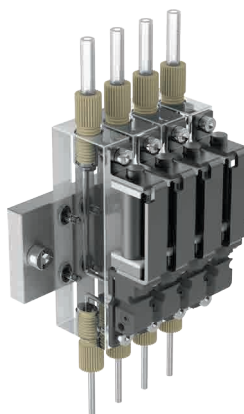
Proportional flow control valve VEMD



Typical applications

- Gas handling ( $\text{O}_2$ ,  $\text{N}_2$ ,  $\text{CO}_2$ , air, etc.)
- Flow control

Dispense head VTOE



Typical applications

- Producing dilutions
- Dosing reagents
- Preparing samples
- Adding fluids to microwell plates

## Added value in all phases of your system's lifecycle

