

## Our contribution: a partner for pneumatic and electric automation technology

Festo is a leading provider of pneumatic and electric automation technology solutions worldwide. We work together in close partnership with our customers to increase the throughput and reliability of systems in factory, process and laboratory automation using innovative, high-quality services.

Thanks to our broad knowledge of technologies and applications, we are able to develop tailor-made, customised solutions that come into their own wherever process reliability and system availability with minimum maintenance work are needed. And we always keep our eyes on the total cost of ownership (TCO) – the total cost of your investment.

## How can you benefit from our laboratory automation range?

### Reliable solutions in a minimum of time

We can plan, develop and implement application-specific automation concepts in a minimum of time. Many years of experience in selecting and putting together high performance control systems guarantees reproducible and reliable process sequences.

### Optimising process costs – ensuring productivity

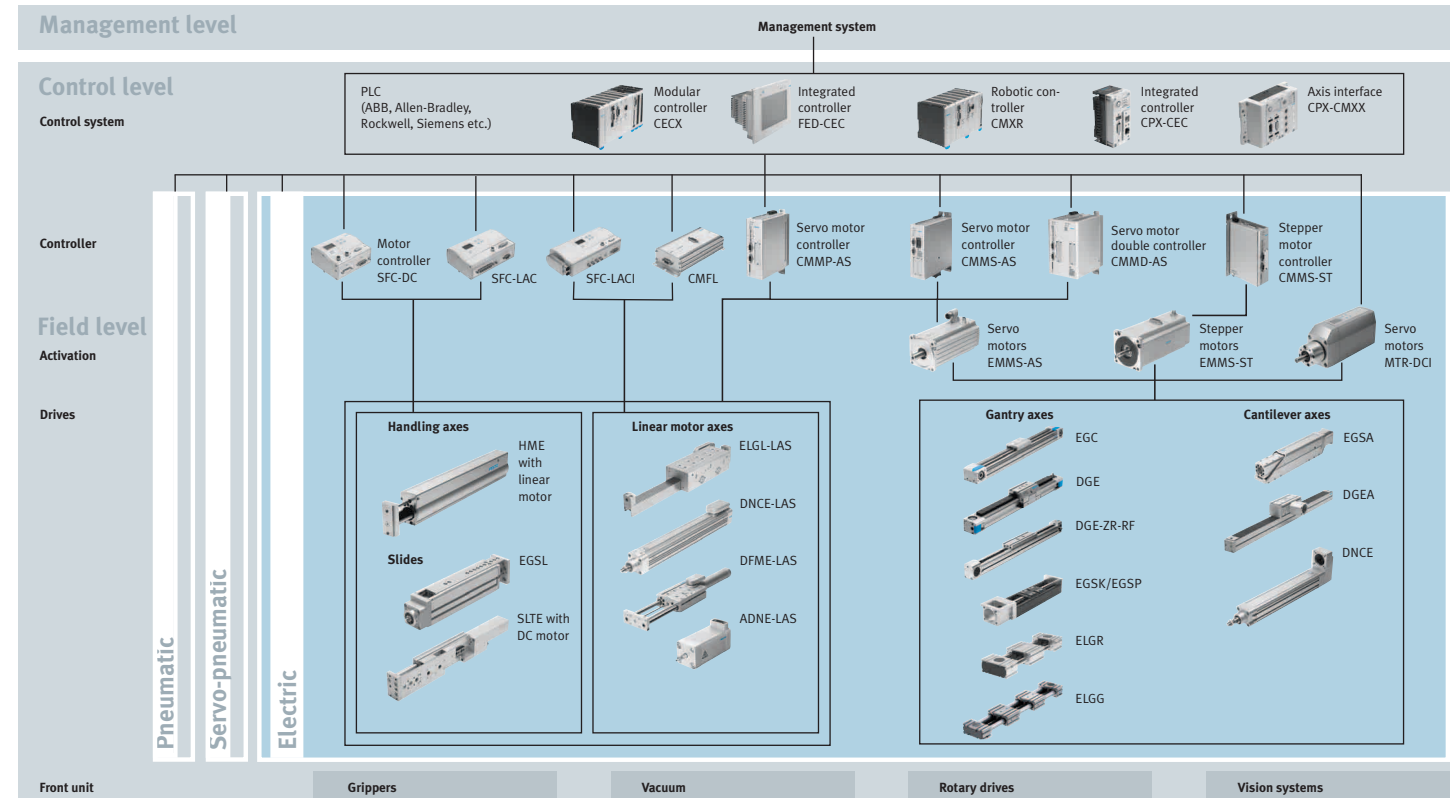
Complete electric and pneumatic drive, positioning and gripper systems, as well as centralised and decentralised control and visualisation systems are available for your individual automation solution. Metering and switching systems for gases and liquids complete our portfolio.

### Gaining an advantage from differentiation

An R&D rate of over 9.5% of turnover ensures continuous innovation. This includes, for example, cost-saving assemblies such as H- and T-gantries for quick handling tasks. New valve terminals based on piezo technology provide extremely precise regulation. LabFab, the modular laboratory platform, sets new standards in serial and parallel process management and in flexibility.



## Intelligent automation – from decentralised controllers to drives



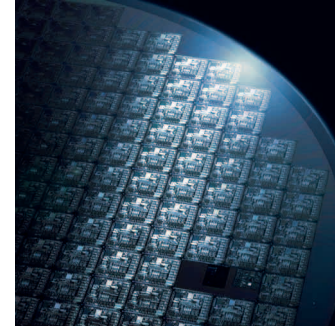
Electric automation technology at a glance – visit [www.festo.com](http://www.festo.com) for a complete overview of the range

## A head start for you: innovation through synergies

For years, Festo has been developing solutions for a very wide variety of industry segments in factory and process automation. This interdisciplinary pool of knowledge has enabled us to create synergy effects by transferring experience and approaches from one segment to another. Our customers benefit from this global networking of our know-how, as it enables us to develop individual concepts exceptionally quickly and cost-effectively.



Food & beverage



Electronic & light assembly



Biotechnology/pharmaceuticals

## Partner for laboratory automation

FESTO

## Your objective: designing laboratory processes efficiently, reliably and reproducibly

In many laboratories, sample processing is still a manual process. Applied automation is normally restricted to partially automated hand-held pipettes, dispensers and readers. In some cases, fully automated analytical or diagnostic devices, including material separation and detection, are used – almost always as stand-alone solutions. Only intelligent and reliable networking of the individual solutions makes it possible to manage the rapidly increasing number of data points and identify their results on time and cost-effectively.

Those who wish to actively meet these challenges and reliably reproduce their processes rely on fully automated procedures. Networked automation of daily routine tasks leaves qualified employees in laboratories more time and energy for their actual work.

## What challenges do we set ourselves as our customers' partner?

### Maximum number of samples, low costs

Laboratory technology is facing new challenges and has to manage a large number of samples, optimise throughput and miniaturise sample quantities. A greater degree of automation is necessary in sample and liquid handling, while flexible use of an installation is a crucial factor in investment.

### Error rates close to zero

Nowadays maximum reliability of results is expected, particularly with routine tasks. As a result, procedures and results are increasingly being recorded and documented automatically. In addition to ensuring the reliability and transparency of individual sequences, it should also be possible to integrate new procedures easily and flexibly in the future.

### Maximum reproducibility

The laboratory of the future is based on uncomplicated documentation of workflows and the transparency and traceability of individual processes. Maximum user-independent retrieval rates are needed, as is the ability to reproduce optimum sequence control.



**Dr. Christine Neuy, Management Spitzencluster microTEC Südwest:**  
"The 'microTEC Südwest' cluster represents Europe's highest concentration of microsystem technology expertise. As a value partner, Festo can use the cluster resources, especially in the area of laboratory automation, to provide strong problem-solving expertise. The LabFab is a clear example of the central role that microsystem technology plays as a key technology: not until sensors, actuators and processors are integrated do intelligent complete systems become possible."

<http://microtec-suedwest.de>



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



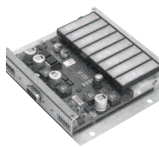


## From pneumatic and electrical components ...

### Liquid handling

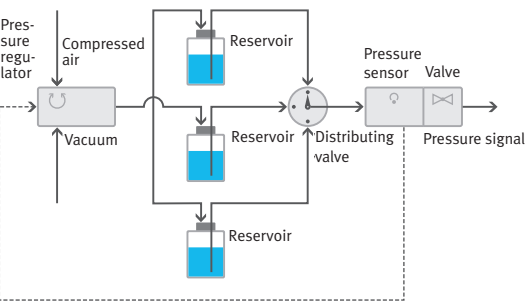


**VODA diaphragm solenoid valves for fluids**  
With extremely small internal volumes and nominal orifices of 0.4 to 6.0 mm (materials depend on media). Designs in NC and NO, as 2/2 or 3/2-way valves. Grid dimensions from 4.2 x 4.2 mm.



**VEMA piezo valve terminal for precise pressure regulation**  
Ready-to-install closed-loop pressure control system in ranges of e.g. -500 to +500 mbar precise to ±3 mbar. With sensors, 8 x VEMC 3/3-way valves and control electronics, tubing connections, fittings, pressure and vacuum containers.

**Integration solutions for fluid metering**  
Compact, space-saving manifold sub-bases with integrated ducts that supply the valves with fluid and power. Mixing and metering operations, as well as other processes, can be controlled in the sub-bases.



### Precise and safe positioning



**Spindle axes EGSK/EGSP**  
The electric axes in the EGSK and EGSP series have impressive precision, compactness and rigidity with a repetition accuracy of <0.003 mm.



**Toothed belt axes EGC**  
Electric axes with precise and rigid guides, versatile mounting and fitting options – ideal for system solutions. Repetition accuracy: 0.02 mm.



**Rotary module ERMB/rotary lifting module EHMB/rotary indexing table DHTG**  
The rotary module ERMB facilitates unlimited and flexible rotation angles >360°. The rotary/lifting module EHMB combines rotation and linear movement. Flexible, pneumatic rotary indexing table DHTG with 2, 3, 4, 6, 8, 12, 24 indexing stations.

**Motor controller CMMP/S/D -AS and servo motor EMMS-AS**  
Precise and dynamic positioning with servo motor and servo motor controller. Includes fieldbus connection, SD card, additional I/Os and appropriate layout and commissioning software.



**Vision and sensors**  
High-speed and high-quality camera systems control the handling application using integrated processor, bus master and evaluation software. A broad selection of up to 1000 sensors facilitates checking of colour, light barriers, pressure, flow or position.



**Multi-axis control systems**  
Decentralised control systems for more than 50 electric axes with master-slave functions. Acceleration ramps, 3D robotic functionality, constant path speed, smooth position transitions and much more.



## ... via ready-to-install subsystems ...



**Decapper EHMR/DSL-SA**  
“On the fly”: automated opening and sealing of vials with screw tops during transport via a rotary/lifting unit with flexible gripper system.



**High-speed picker HSP/HSW**  
Ready-to-install handling module for automatically moving, feeding and removing vials in the smallest of spaces with a movement angle of up to 90° (HSW) or 180°. Repetition accuracy: 0.02 mm.



**H-gantry light EXCM**  
Weight-optimised 2-axis positioning systems with toothed belts, complete with stepper motors, motor controller, multi-axis control system. Repetition accuracy: 0.1 mm.\*

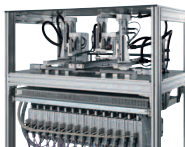


**H-gantry EXCH/T-gantry EXCT**  
Sturdy and highly dynamic 2-axis positioning systems with stroke lengths of up to 2000 mm. Repetition accuracy: 0.1 mm.

**Multi-axis gantries**  
Customer-specific system solutions, including control systems, based on the multi-axis modules for Cartesian axis systems, including optional front unit for rotating, gripping, vacuum.



**Fully integrated system solutions**  
The ideal plug & work solution: application-specific handling systems complete with multi-axis control system and supply systems.



**Tripod EXPT**  
Highly dynamic and precise movement in space with the high-speed handling EXPT. Small moving masses and delta axis arrangement, combined with robotic control for free movement in 3D.



**Adaptive gripper DHDG**  
All-in-one bionic gripping solution with minimum weight for highly dynamic response. With individual bionic gripper fingers for gentle, flexible gripping.

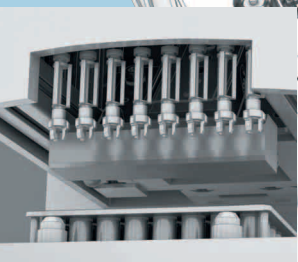
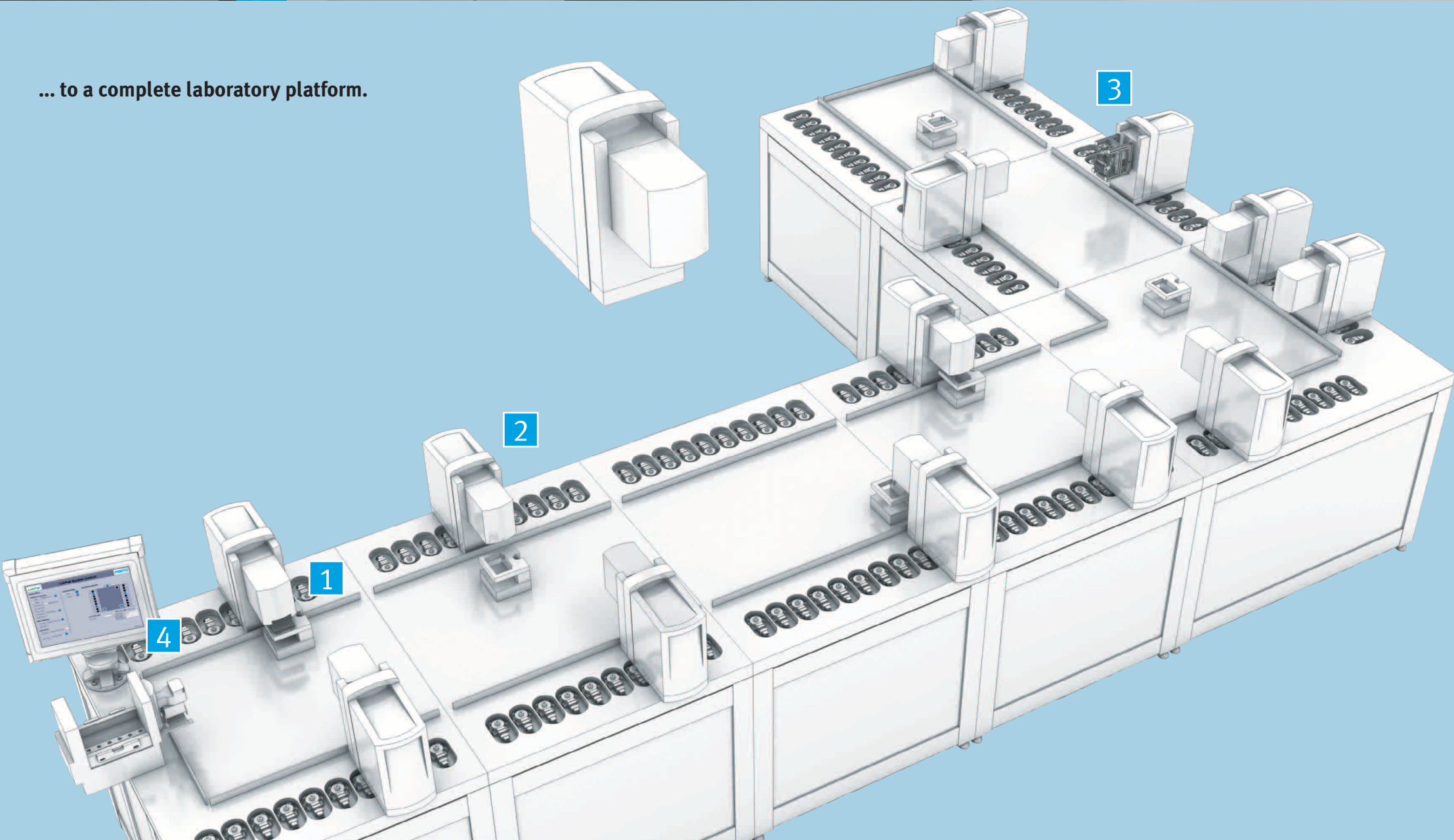


## LabFab – revolutionising laboratory automation

LabFab is a completely new conceptual approach to automated laboratory platforms; it can execute multiple processes in parallel and independently of each other. The sample plates move while the handling modules only carry out minimal vertical movements. The benefits of the new principle: shorter supply lines, little risk of contamination and extremely accurate positioning.

The compact LabFab can be adapted to new processes with little extra investment. The planar tables can be very easily expanded with additional modules to increase the surface area and implement additional processing steps. This provides the user with maximum flexibility for serial and parallel processes and in adjusting the system configuration. Contact your Festo technical consultant if you would like to become a partner in Festo LabFab.

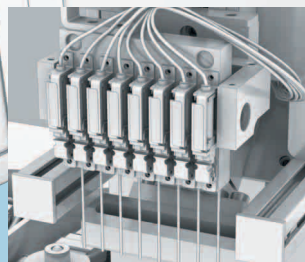
## ... to a complete laboratory platform.



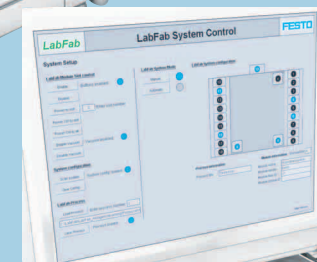
1  
Gripper module with decapper



2  
Carrier positioned at handling module



3  
Dispensing module



4  
Monitoring and control elements

### LabFab laboratory platform



**Planar table with module slots**  
The planar table, with a projecting linear drive, is surface-coated and can be connected in series. The aluminium border contains the slots with robot interfaces for easy integration of, for example, liquid handling modules.



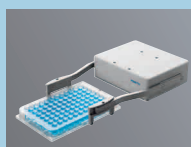
**Carrier modules**  
The micro well plates and other sample carrier systems can be transported by means of a solenoid-coil driven carrier system (part of the reluctance motor). Positioning accuracy: approx. 5 µm.



**Dispensing/pipetting/reader/aspirating modules**  
The dynamic processing of the samples at the modules can be done well by well, row by row or plate by plate; this is highly precise process which takes place via a vertical stroke and which benefits from extremely short tubing or other supply lines.



**Stackers and other standard modules**  
Unlimited expansion options thanks to stackers, plate hotels, incubators and other process-related modules that can be easily integrated, if necessary with converter modules.



**Gripper module**  
An electric gripper system ensures secure picking up, transporting and releasing of micro well plates.\*

**Please note:**  
These pages contain selected products only.  
For additional information, see [www.festo.com](http://www.festo.com)