

Fluid Power Training

Versatile Solutions for Essential Technologies

FESTO



The future holds great challenges for workers dealing with hydraulics and pneumatics



Make machines safer and easier to run.

Address inefficiencies.

Build smart components and applications.

Expand power density and energy storage.

Improve reliability.

Enhance redeployment capabilities.

Decrease size and weight.

Create hybrid systems.

Increase sustainability.

Reduce environmental impact.

01 Expertise

02 Resources

03 Inspiration

04 Digitalization

Widely-used essential technologies

Alongside electrical and mechanical power, fluid power is a common method of power transmission; one that relies on the use of a fluid – liquid or gas – to generate, control, and transmit power. The increasing interest in fluid power stems from its extreme flexibility and unique capabilities compared to other power transmission methods. Research and technology advances make the field of fluid power highly dynamic.

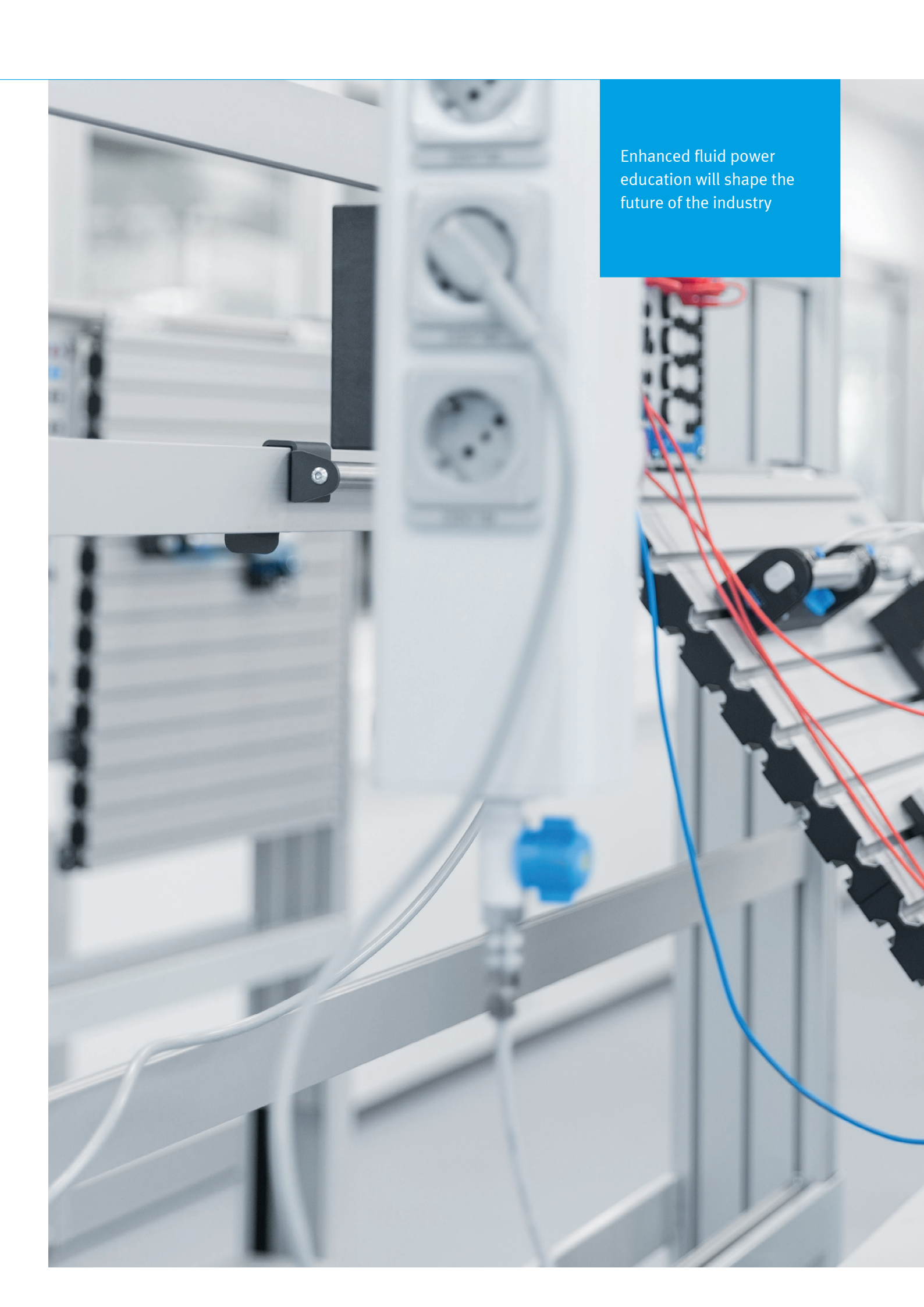
Hydraulics and pneumatics components and applications are integrated in a wide spectrum of everyday products and industrial applications, driving and controlling mechanical motions to accomplish work. Understanding these technologies is a prerequisite for a large number of workers in a variety of industries.

The keys to education success

Training needs in fluid power are as diverse as the field itself. Technical and vocational schools or colleges, as well as university engineering departments, develop different courses and programs to train the future workforce, while industrial companies and training centers train experienced workers to develop or sharpen new skills and knowledge.

Success factors of fluid power education are many. Early exposure to science and technology will attract more students to the field. Fluid power training courses and programs should be enhanced and given more prominence in schools. Investments in well-designed lab facilities stimulate and motivate students. Instructors need support to stay abreast of new technologies and trends. And the alignment of education, research, and industry will support community growth and sustainability, as well as move fluid power technologies forward.

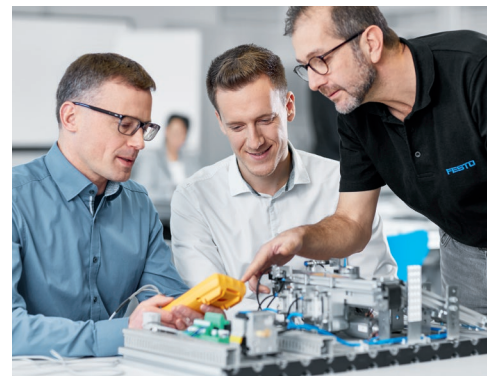
Guidance from specialists in technology, training, and education, also proves very useful.

A photograph of a control panel or rack system. The panel is light grey and features several circular ports, some of which are occupied by cables. A prominent white cable runs vertically down the center. To the right, a bundle of red and blue cables is connected to a rack of ports. The background is slightly blurred, showing more of the equipment. A blue rectangular box is overlaid in the top right corner, containing white text.

Enhanced fluid power
education will shape the
future of the industry



Optimal training yields competent, responsible professionals ready to address industry challenges.



“

How to get skilled, capable workers?

1. Teach with realistic project tasks.
2. Follow professional working stages.
3. Include economic and safety aspects.

These are the three main principles my team and I have in mind when designing hydraulics and pneumatics training solutions. We stick to a sound pedagogical approach to drive student learning. Learning tools support each step of the “complete and professional course of action” model, for a successful transfer of acquired competences and skills into the professional context.

What key advice would you give to instructors considering new fluid power equipment?

Invest in solutions that are truly modular. Training programs change, as do technologies, industry requirements, and teaching methods. Make sure training systems can be enhanced and upgraded over time without duplicating equipment. Modularity also enables construction of needs-tailored setups and expansion to other automation topics, thus increasing educational value.

Authenticity is important. Not only should the systems replicate realistic applications; real-world challenges must also be addressed. For example, safety is a key concern in the industry. Therefore, our equipment set “Safety in pneumatic systems” focuses on the systematic optimization of safety in pneumatic systems. Authenticity increases qualification of skilled workers.

”

Peter Häfner
Product Manager, Fluid Power

Promoting excellence in fluid power education

Hydraulics and pneumatics technologies are important cornerstones of the solutions developed by Festo in the field of factory automation. For over 50 years, Festo Didactic specialists have been leveraging these industrial solutions to create optimal educational solutions.

Drawing on its expertise and on partnerships with science and industry partners, Festo Didactic occupies a strategic position for understanding major industry trends – such as Industry 4.0, Connected Learning, and digitalization – and their impact on the future of production, enabling the company to design training solutions at the forefront of innovation.

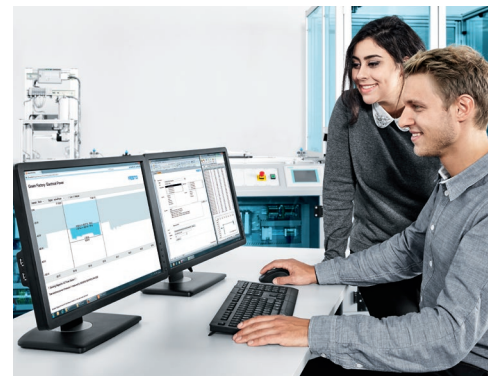
Every training endeavor is unique

In addition to high-quality training resources, a comprehensive scope of services provides tailored support to technical education instructors, around the world.

- Training and Consulting offers world-class services aligned to the ISO 29990:2010, a standard for quality management of educational institutions that focusses on learners, learning outcomes, teaching services, and the competence of the provider. Services mainly relate to training content and learning processes, knowledge transfer, curriculum design, goals and evaluation methods, competences of trainers, and performance management. Several training courses directly tackle hydraulics and pneumatics topics.
- Dedicated teams handle equipment installation, commissioning, “train-the-trainer” sessions, and maintenance to maximize return on laboratory investments.
- The Solution Center develops customized training systems to match specific training requirements.
- The Global Project Solutions team plans, designs, and equips complete, turnkey environments for science, technology, and education.

Well-planned investments will ensure that specific missions and objectives are fulfilled.

An outstanding pool of synergistic resources allows for tailored arrangements that support successful fluid power education.



New

New equipment sets

Check our website for future releases

- TP 101 + (Pneumatics)
Advanced Level Systematic Troubleshooting
- TP 501 + (Hydraulics)
Advanced Level Systematic Troubleshooting

Most popular equipment sets

- TP 101
Pneumatics Basic Level
- TP 201
Electropneumatics Basic Level
- TP 501
Hydraulics Basic Level
- TP 601
Electrohydraulics Basic Level

Facilitate knowledge acquisition.

A wide range of comprehensive, specialized materials – workbooks, textbooks, manuals, dictionaries, etc. – are available to support learning and teaching pneumatics and hydraulics. Courseware is aligned to the latest standards. A campus license allows reproduction of the content at an affordable price.

Set the stage for efficient hands-on learning.

The online configurator helps instructors to select versatile, ergonomic workstation systems and power supplies. The electrical interface of the tabletop, mobile, or fixed workstations is separated from hydraulics and pneumatics components for increased safety. Quick-Fix® profile plates enable free construction of circuits, multiplying the learning value.

Select training equipment.

Equipment sets are available for a wide range of topics that match subjects covered by fluid power training courses and programs. Each set is focused on a specific subject and is provided in trays that facilitate components storage and inventory. Optional industrial accessories and components can be used to expand sets.

Provide tools to optimize lab work.

FluidSIM® and FluidLab® are perfect work platforms for designing, simulating, controlling, testing, and measuring fluid power circuits. With several licensing options available, these software programs enable students to deepen their understanding of circuits, components, and technologies.

Use multimedia to increase student motivation.

Web-based fluid power courses and knowledge check tests are available to supplement training. Tec2Screen® offers a new and easy way to learn complex technology and supports Connected Learning in pneumatics and hydraulics. Videos, animations, measuring exercises, and test assignments inspire students to explore and discover.

Hardware, courseware, and software offered by Festo, together with training and complementary services, coalesce into highly efficient and comprehensive training solutions.



Everything from a single provider ensures coherence across all fluid power learning.

- Hydraulics
- Pneumatics
- Electrohydraulics
- Electropneumatics
- Closed-loop circuits
- Sensors
- PLC
- Safety
- Vacuum technology
- Measurement
- Troubleshooting

Take a free Knowledge Check and test your technical know-how in fluid power technologies.

→ www.festo-didactic.com/int-en/services/test-your-knowledge

Scaled laboratory facilities fulfill specific requirements and objectives in various fluid power training settings.

→ bit.ly/complete-action-lab



The combined use of computers, connected learning tools, design and simulation software programs, data acquisition systems, and web-based courses support students throughout the learning process and contribute to a positive learning experience in a stimulating environment for future fluid power engineers.

This sample lab can be scaled up to cater to different needs. It can also be enhanced by the flexible room concept from Festo Didactic based on organized storage, practical workstation systems, and a flexible ceiling system – with power, compressed air, and data connection directly at the learning location – for a holistic concept for multi-functional rooms.

How does this lab support the steps of the “complete and professional course of action”?

- Information – Knowledge acquisition through lectures and self-study using multiple resources.
- Planning – Design of a circuit and list of parts with a simulation program.
- Implementation – Building and operation of the circuit with the hardware.
- Checking – Comparison of actual and target results, optimization, and troubleshooting, using measuring components and computer-based tools.
- Reflection, documentation – Evaluation and reporting.

→ bit.ly/6-station-lab



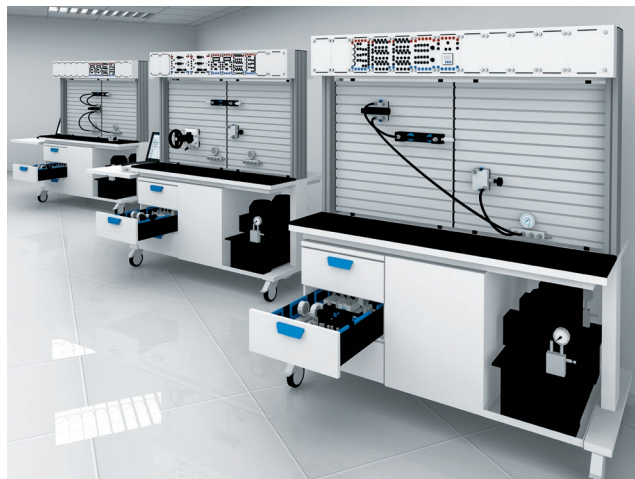
An expandable set-up that covers the basics

Instructors can quickly – and at reasonable cost – add a compact station to an existing lab, e.g., mechatronics or automation, to teach the basics of pneumatics, hydraulics, and electro-pneumatics/-hydraulics.

A tabletop station, with its ER-frame, electrical components, and profile plate, with an assortment of equipment sets, is an affordable choice for pneumatics, hydraulics, and sensors education.

FluidSIM® and EasyPort are used for virtual control, eliminating the need to purchase a beginner-level PLC. Workbooks included in the campus license also include legal rights for unlimited reprints at no further cost.

A wide selection of sets and components match evolving needs without duplicating equipment. This station requires no consumables and can be used for years; a wise investment that can be expanded over time.



Dive into advanced topics with subject specific extensions

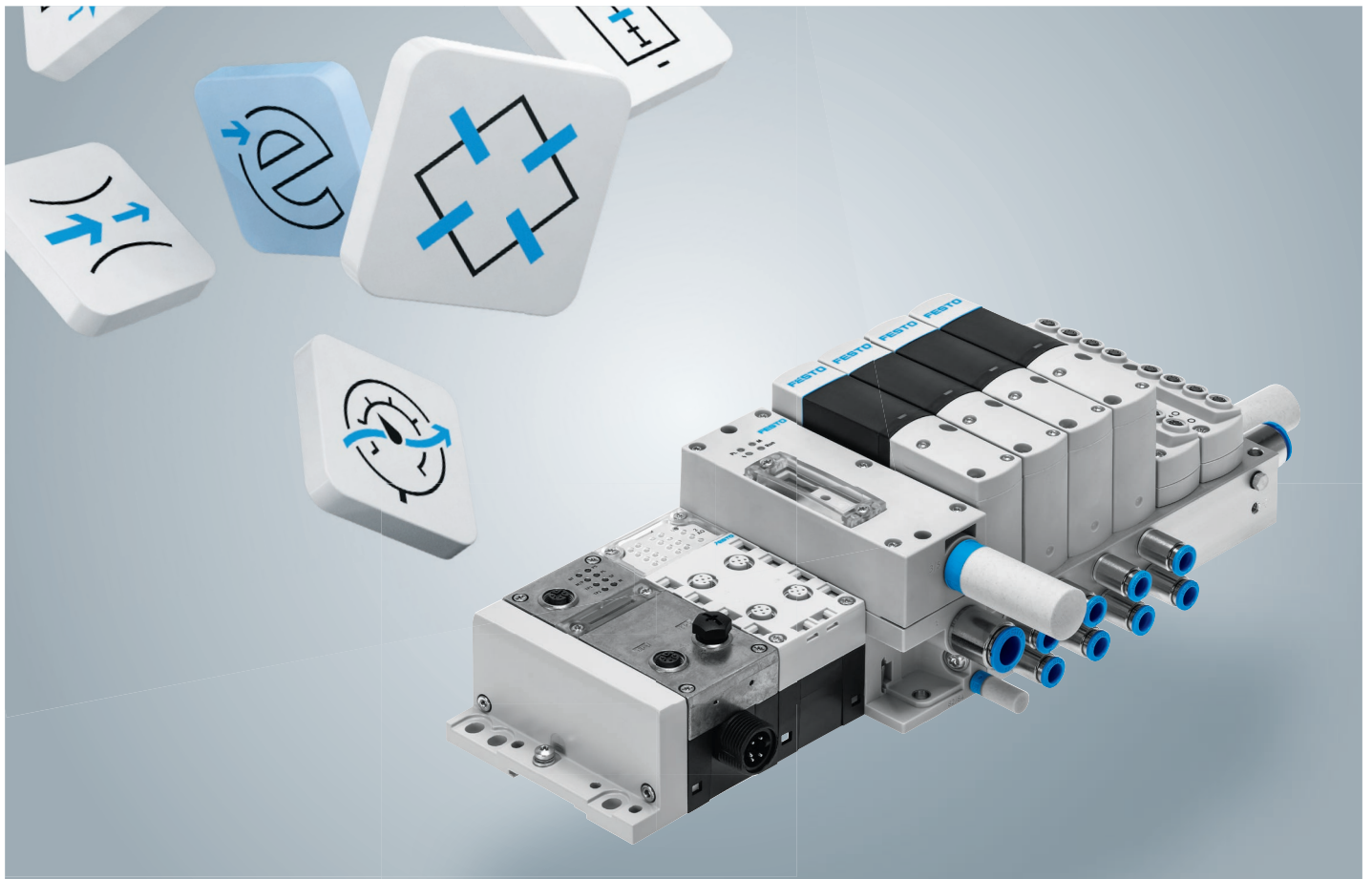
The wide choice of sets and components enables instructors to easily build customized arrangements to cover specific subjects, starting from the basics and expanding to advanced topics. This allows for targeted knowledge acquisition and skills development, aimed at specific course or program objectives.

Common subject extensions include:

- Industrial pneumatics – basics and advanced
- Industrial pneumatics – industry-specific extensions
- Advanced closed-loop control in hydraulics/pneumatics
- Proportional hydraulics
- Basics and mobile hydraulics
- Industrial hydraulics – basics and advanced

Visit the virtual lab to see equipment sets recommended for each extension.

Digital technologies open new possibilities in the field of hydraulics and pneumatics.



Festo Motion Terminal: the world's first valve controlled by apps

The digitalization we are experiencing as part of Industry 4.0 will profoundly alter the world of production. For the first time ever, the functions of a valve can be controlled and changed by software – without the need to change the hardware.

With the Festo Motion Terminal, Festo is launching the world's first standardized platform that will develop into a „cyber-physical system“ thanks to its intelligent fusion of mechanics, electronics and software. This system is characterized by an extremely high level of adaptability and flexibility. It will enable construction of intelligent machines now for the world of tomorrow, and ensure systems are truly ready for Industry 4.0, even in terms of pneumatics.

To learn more about digital pneumatics and the Festo Motion Terminal, please visit:

→ [festo.com/vtem/en/cms/motion-terminal.htm](https://www.festo.com/vtem/en/cms/motion-terminal.htm)



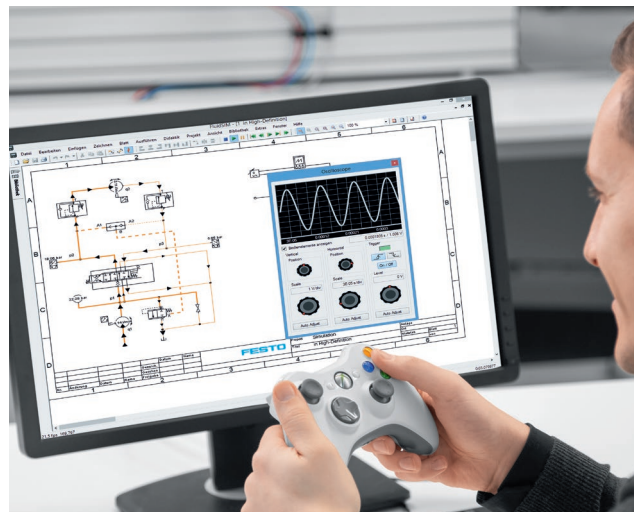
All the necessary tools for blended and pure digital learning

The variety of resources and formats offered by Festo Didactic enable instructors to support traditional, blended, or purely digital learning in fluid power education. Contemporary and innovative educative resources meet the needs and expectations of students and teachers alike. They encompass web-based courses and knowledge checks, design/simulation/measurement software programs, learning content management (Classroom Manager), online training programs (myleCampus), learning media creation and design software (Content Builder), and more, always in user-friendly environments.

Tec2Screen® is the key to Connected Learning in fluid power, and makes pure theory exciting and interesting thanks to the close link to reality and everyday working experience. To explore the connection between the real and the virtual world, the Tec2Screen® base links an iPad® with the patented Connects – plug-in interface modules with a patented interface. The Connects enable direct interaction between software and hardware, and therefore direct interaction between theory and practice.

Visit the website for details and videos:

→ [festo-didactic.com/int-en/highlights/connected-learning/tec2screen](https://www.festo-didactic.com/int-en/highlights/connected-learning/tec2screen)



FluidSIM® – A professional CAD system for fluid power

FluidSIM® combines an intuitive circuit diagram editor with detailed descriptions of all components, component photos, sectional view animations and video sequences. As a result, it is perfect not only for use in lessons, but also for lesson planning, and as a self-study program.

The easy intuitive user interface, extensive component library and robust simulation core are complemented with a large collection of didactic materials. FluidSIM® is compliant to ISO 1219 and can also easily be used as a controller for real fluid power systems: the EasyPort® device makes it possible.

Discover all features and download a free trial version:

→ bit.ly/FluidSIM-software

Download fluid power symbols aligned to the latest ISO standards, free of charge, for easier circuit design:

→ www.festo-didactic.com/int-en/services/symbols



For detailed information about all fluid power training solutions:
→ bit.ly/Fluid-Power-Product-Guide

Festo Didactic SE

Rechbergstraße 3
73770 Denkendorf
Germany
Phone: +49(0)711/3467-0

Festo Didactic Inc.

Eatontown, NJ 07724
USA
Phone: +1-732-938-2000
Toll Free: +1-800-522-8658

Festo Didactic Ltée/Ltd

Québec (Québec) G2N 2K7
Canada
Phone: +1-418-849-1000
Toll Free: +1-800-522-8658

did@festo.com
www.festo-didactic.com