Highlights 2009

FESTO

New opportunities are needed!

Ideas for innovations? Sometimes they're close at hand – and can be identified at first glance as a raw material of the future: quartz sand as a bright spot on the horizon in the field of machine building. This source material for wafers and microchips makes it clear that the future of automation technology will be defined by new technologies and materials. Within this context, it is extremely important to recognise, communicate and make use of efficient technologies. Mechatronics and miniaturisation, as well as piezo and systems technology, support trend-setting industry sectors such as photovoltaics, and also inspire traditional machine building to become more efficient. Combined with correctly sized and selected drive technology in terms of power and compressed air usage, the potential of a production system can be exploited to an even greater extent, or laid out more safely in the spirit of the new machinery directive. Seen from this point of view, an entirely new light is shed on product innovations – as a source of inspiration for new machine concepts and processes.

Dr. Eberhard Veit
Chairman of the Management Board and
Member of the Management Board Technology and Market Positioning
of Festo AG

Efficiency in focus: intelligent automation

Drives

Valves and Valve terminals

Compressed air preparation, vacuum and connection technology

Electronic Systems

Services

Didactic

Industry sectors

Simply adding value – reduce costs, ensure quality

Our challenge is to provide our customers with a lasting and sharper competitive edge.

Our unrelenting motivation to improve these things that we do particularly well is part of that; such as, for example, creating simple solutions for our customers' automation tasks.

New solutions which reduce costs through innovative product design without compromising quality. New solutions which generate potential savings, such as the internationally unique PPS cushioning system. New solutions which optimise your systems thanks to the advantages offered by innovative materials – with astonishingly simple products such as the valve range VB 12.

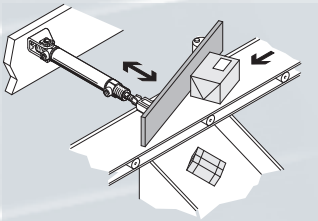
Solutions which highlight all of Festo's added value – and thus not only enhance your products, but your processes too.

World's first!
Cushioning system PPS

- Eliminates the need for manual adjustment
- No stick-slip effect: ideal cushioning even with changing loads and speeds
- Standard DSNU or in stainless steel

Potential savings thanks to PPS cushioning – an example

A system for sorting packages consists of 60 stations, each with one round cylinder DSNU. Installation and adjustment is reduced by 5 minutes for each cylinder, thus saving a total of 300 minutes or 5 working hours.



Tubing and fittings combinations

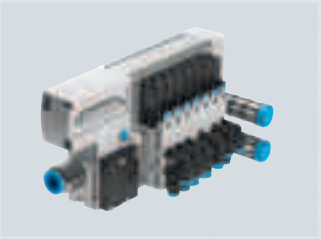
Simply more value: only pay for the functions you really need – and be confident about the quality of your processes. Suitable for every process: perfectly matched fittings in order to ensure a reliable supply of compressed air to your systems.

Safeguarding process quality thanks to free selection software, any desired package size and printing, logistics optimisation services and Europe's fastest delivery service.

Continuously expanding product quality in line with your requirements. New: NPQM metal fittings for standard applications and NPQP fittings as an attractively priced alternative to stainless steel fittings, as well as customised tubing.

Astonishingly simple solutions: valve range VB 12

- Reduces costs: housing made of reinforced polymer
- Extremely lightweight, ideal for cantilever axes, inexpensive transport costs
- A single basic valve in stock for numerous applications, as a component or a multi-pin valve terminal
- Simple, secure attachment



Further information

- Standard drives brochure
- Standard valves brochure
- System overview of tubing and fittings combinations

For products related to the topics see ..... page
Round cylinders 22
Valve terminals 36
Valves 37
Polypropylene fittings 46
Customer-specific tubing 47
Pressure booster 49

Mechatronic motion solutions – uniquely compatible

Unique throughout the world: platform strategy with various possible combinations of different technologies. Decisive advantage: appropriate solutions for reliable, economic automation.

Linear and rotary motion, vacuum applications, gripping and control: mechatronic motion solutions combine components, modules and systems for all types of automation solutions – whether pneumatic, servo-pneumatic, electrical or mixed. Including software solutions!

Simultaneous development of mechatronics, electrical components, electronics and software significantly shortens engineering time and accelerates introduction to the market. Quick commissioning and increased process reliability during operation ensure a fast ROI.

Peter Löbelenz – director of project engineering and quotations for handling technology

Ideal package for handling technology

"Each customer has different requirements. As a result, modules or subsystems are in demand because complex system solutions are required. In addition to this, more and more emphasis is being placed on mechatronic solutions in the RFQs we receive because they combine various technologies offered by a single supplier.

Mechatronic motion solutions provide exactly the right answer. Everything fits, from motion control with a direct connection to cameras and monitoring of all types of motion, up to the front unit with grippers or vacuum technology.

And Festo itself also benefits from this competence. With mechatronic motion solutions, we're able to create solutions and systems which are perfectly tailored to the actual requirements. And thus Festo's Systemtechnik division ensures universal, globally accepted handling systems."

Efficiently automated: the flat panel display and solar industries

Lifters for glass substrates often have to travel great distances – and that eats up precious time. This case involves strokes of 2,000 mm!

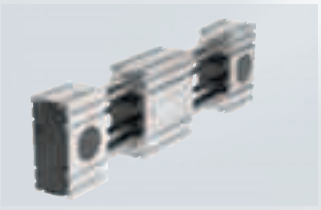
Quick lifting and lowering is also in demand. In combination with a pneumatic axis, the electric toothed belt axis serves as a counterbalance, making it possible to reliably transport the glass substrates over the entire distance in a cycle time (for lifting motion) of less than 2 seconds.

Linear motor axis ELGL-LAS

- Air bearings
- High precision and maintenance-free
- Integrated locking brake
- Several carriages possible

Electric toothed belt axis ELGR

- Highly dynamic
- Freely selectable position for motor attachment
- Long service life



Radial and angle grippers HGRC/HGWC

- 3 different opening angles
- Compact, robust design
- Long service life

www.MechatronicMotionSolutions.festo.com

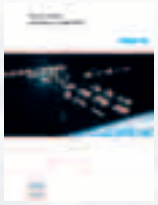
For products related to the topics see ..... page
Electric axes 25
Electric linear motor axes and cylinders 27
Motors and controllers 31
Motion controllers 29, 33
Front unit grippers 23
Front unit vacuum 45
Servo-pneumatics 34

Valve terminals – increased productivity as well as reduced installation costs

Function integration as a big trend: The valve terminal is becoming the automation platform of the 21st century.

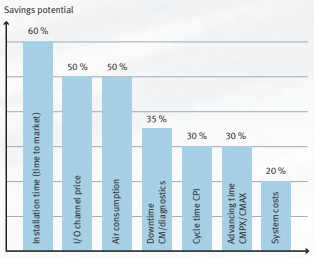
There's hardly an innovation that has shaped automation to such a great extent or succeeded in reducing installation costs and improving productivity in such a lasting fashion. As a market leader and the inventor of the valve terminal, we know where potential still exists and where new potential can be exploited – to your advantage. For example through function integration, renewed flexibility for installation concepts and significantly increased reliability by means of diagnostics and special valves.

Example: packaging machine
A controller on the valve terminal CPX/MPA monitors pressure, flow and wear of components which are critical to the process, such as belts and cutters at this tubular bag packaging machine. Subsequent integration of diagnostics and condition monitoring was no problem at all, and data from the existing controller are now made available to an OPC server. The concept can be transferred to a great variety of applications – Festo's service team would be happy to provide you with the necessary support.



Further information
- Valve terminal system overview
- "Planet fieldbus" brochure
  - Profinet, Profibus
  - Ethernet/IP, DeviceNet
  - EtherCat, Modbus/TCP, CANopen

Effectively reducing costs
Eberhard Klotz, director of Promotion Concepts for Products and Technology: "In the field, valve terminals are a very effective way of reducing total cost of ownership, thanks to the integration of electrical as well as pneumatic functions. Motion control is now also being integrated. This results in a reduction in system costs by as much as 20 %, and even up to 60 % in some cases, as demonstrated by the savings potential shown in the graph."



In focus at Festo during recent years: function integration on valve terminals
- Library for pneumatic diagnostics with OPC server
- Direct acquisition from displacement encoders
- Diverse safety functions
- Pressure sensors
- Temperature measurement
- Proportional pressure regulators
- Integrated servo-pneumatic and electrical position controllers

Integrated controller CPX-CEC
- CoDeSys compatible
- Diagnostics/condition monitoring functions library
- 2.5D motion control

Position module CPX-CMAX
- Maximum performance density
- Maximised dynamics, force and flexibility
- Positioning down to ±0.2 mm

Valve terminal VPPM-MPA
- Proportional valves at the fieldbus/Ethernet
- Innovative cascade control
- From web edge control and ultrasonic welding, right on up to controlled vacuum handling

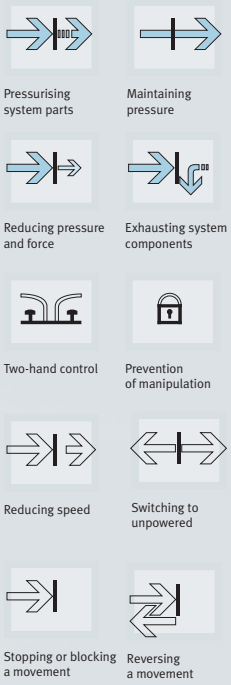
Safety in automation – new standard and suitable safety concepts

Are you ready for the new standard? The countdown has begun – the new DIN EN ISO 13849-1 directive will be valid as of December 2009.

Binding machine safety and comparable assessment criteria for electrical and pneumatic components – these are, amongst others, the contents of the new standard. In order to ensure that you can achieve the necessary safety targets more conveniently and faster, Festo offers appropriate engineering and the use of safety-oriented components and systems, as well as predefined, time-tested circuits.

Safety from a single source
The 10 safety functions shown in the graphic can, for example, be derived from and implemented using the following four operating modes
- Initial position/standstill
- Normal operation
- Setup and service mode
- Emergency mode

Details regarding Festo circuits and components are included in the “Safety engineering guidelines”.



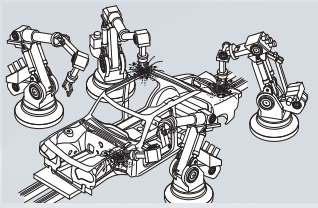
4 operating modes –
10 safety functions

Fit for Safety? Didactic!
Our comprehensive offer includes seminars about safety engineering from Festo Didactic: one-day focus seminars, expert seminars lasting several days, as well as a web-based training programme which demonstrates the approach used for technical safety requirements at a packaging machine, and the implemented solution.

Safety in the automotive industry
Safety engineering is a central issue in all areas of the automotive industry. One of the requirements is safe and quick exhausting of systems, for example in car body production. The production lines are secured by means of safety devices which separate them from one another in order to reduce the hazards.

When staff enters a production system in order to execute maintenance work, the area in question has to be exhausted quickly and safely. Staff safety cannot otherwise be ensured.

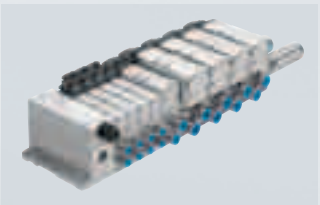
The safety valve MS6-SV offers a solution which additionally prevents abrupt motion of the drives through gradual pressure build-up when the machines are started back up again.



Soft-start and exhaust valve MS6-SV
- Certified in accordance with EN 954-1, cat. 4, ISO 13849-1, PL “e”

Complete customer-specific solutions
- Safe exhaust
- Safe reversing
- Safe pressure reduction

Standard valve terminal VTSA
- Integrated: “Safety@Festo” safety engineering
- Individualised integration options
- Complete solution: electrical and pneumatic components from a single source



For products related to the topics see . . . . . page
Soft-start and exhaust valve 44
Valve terminal with integrated safety technology 36
Valves with switching position sensing (e. g. for presses) 37
Vales for additional safety (e. g. in the automotive industry) 37
Didactic focus seminars regarding the issue of safety 21, 58
CPX terminal with integrated controller for diagnostics and condition monitoring 32

Energy efficiency – all-embracing for more productivity

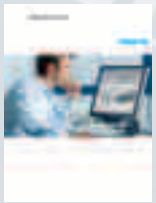
Energy can be saved with the help of energy-efficient machine concepts – and productivity can be significantly increased at the same time.

Uncovering this kind of productivity potential necessitates an exact analysis of the energy aspects of the respective machine or system. Only an all-embracing examination of the process sequence, from layout to operation, as well as the use of the right technology mix, makes it possible to realise significant potential savings. Festo's team of experts would be happy to provide you with support for the duration of the entire life cycle of your machines, from layout through determining the machine concept to operation.

Effective layout – the application at a glance
Energy efficiency begins with the right layout. Not too large and not too small – exactly in line with actual requirements plus a small amount of reserve performance, combined with the right technology. This reduces investment costs by roughly 10 % and operating costs by about 40 % for a pneumatic system.

Efficient technology mix: servo-pneumatic welding tong with roughly 25 % less compressed air consumption than conventional welding tongs

The right layout with engineering tools from Festo
Engineering tools from Festo facilitate the efficient layout of pneumatic, servo-pneumatic and electrical systems.



And if your system has been laid out in an optimised fashion, it's advisable to secure the cost advantages achieved for the long-term by means of an energy monitoring concept.

Energy monitoring – save with the right diagnostics concept
Monitoring, as well as successful interaction amongst drives, attached mechanisms, sensor technology and a decentralised controller, sustainably minimise energy consumption of the respective machine. The energy monitoring system GFDM is a modular, adaptive solution for various machine concepts, including continuous comparison with automatically generated reference data, integrated assessment of consumption values and acquisition of trend data, as well as worldwide access to your data via an integrated web server.

Efficient production: assembly machine with integrated diagnostics concept and energy monitoring concept from Festo

Live and breathe energy efficiency
That's exactly what we do! And our efforts have been rewarded: Festo was honoured with the "2008 Energy Efficiency Award" and the "2007 Compressed Air Energy Award" for innovative energy saving concepts.

Energy Saving Services
Festo's Energy Saving Services facilitate the energy-efficient, cost-optimised operation of machines and systems.

1. Analysis of the current situation
The analysis is used to determine your potential energy savings, as well as initial values throughout the entire compressed air system.

2. Concept planning
Data gathered during the analysis are assessed and leaks are pinpointed by means of leak management software. This results in detailed concepts for eliminating leaks, modernising applications which are not energy-efficient and, on request, a condition monitoring solution.

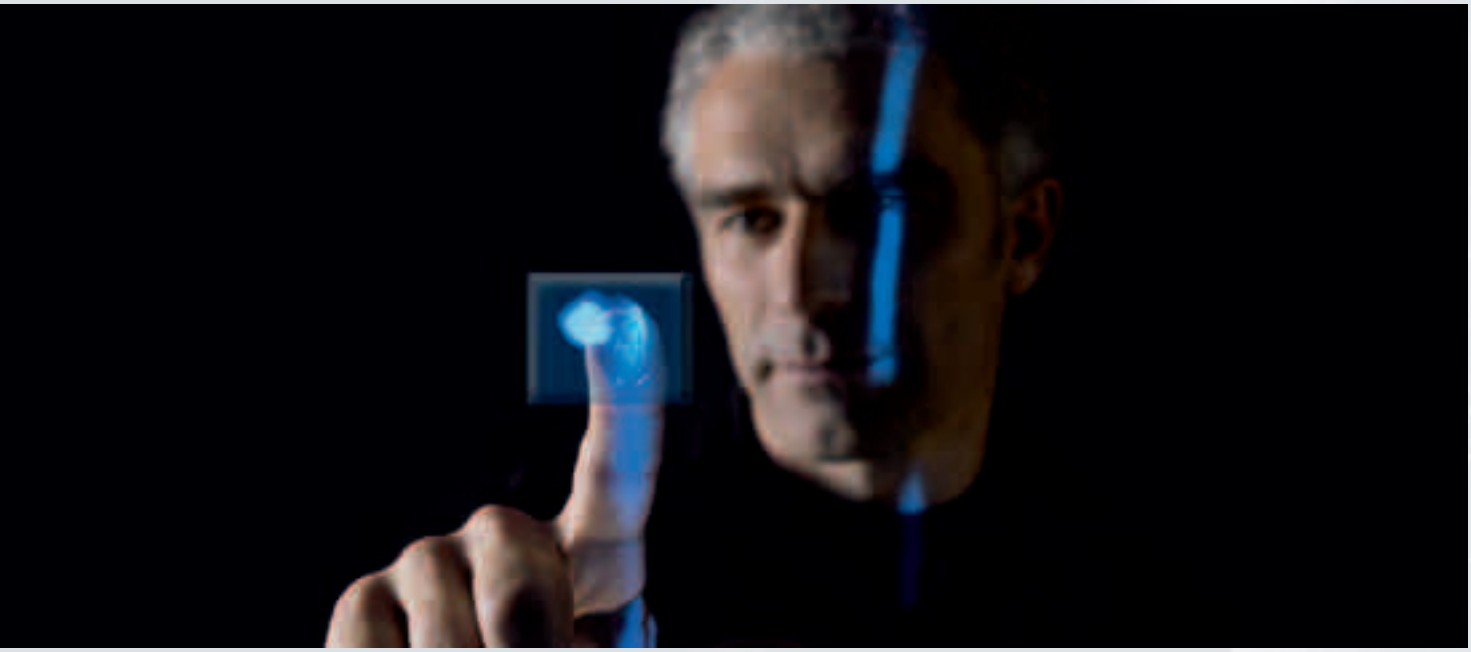
3. Implementation
Prompt implementation ensures a quick return on investment. Festo service technicians can provide you with support in this area by taking care of the professional implementation. Your maintenance personnel is not burdened with any additional workload.

4. Maintenance
The optimised condition should of course be maintained and that's why we recommend the 3-2-1 concept: 3 leak searches and maintenance procedures in the first year, 2 in the second and 1 in the third. And you can expand the know-how of your own staff at the same time by means of training programmes offered by Festo Didactic.

For further information
www.festo.com/en/energyefficiency

For services related to the topics see . . . . . page
Energy Saving Services 57

Customer-specific solutions – benefit from leaner processes



Just as unique as a fingerprint: customer-specific solutions ranging from simple pre-packs to ready-to-install complete solutions.

Streamline processes, save time and money and simultaneously increase process reliability – these are the objectives of our customer-specific solutions. You can fully concentrate on your core competencies because Festo supports you consistently throughout your entire value creation process – from engineering to systems operation, in individually defined process steps or for entire process sequences. The advantages are explained in detail on the next page.

Engineering
Systems must be in compliance with the latest technical standards and quickly available to the market – at an attractive price. Our specialists can help you achieve this with their engineering and pneumatics know-how. And you'll reduce your R&D time and costs as a result. If required, we can also develop special versions for you.

Festo – your partner for:
- Determining technical parameters
- Selecting components
- Creating pneumatic circuit diagrams
- CAD design
- Creating a parts lists

Procurement
Why not reduce your purchasing efforts to a single order for a large number of system components? You can order all components with a single number from Festo, thus reducing costs, storage space and ordering time. You can even eliminate the time required for putting components into storage and retrieving them by having them delivered directly to the site where they'll be used.

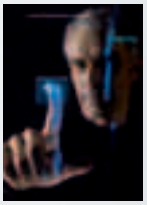
Streamline your purchasing processes:
- Product entry into the enterprise resource planning system (ERP)
- Scheduling and ordering
- Deadline and order monitoring
- Goods inwards and inspection
- Booking goods into the ERP system and assigning them to storage locations
- Retrieving goods from the ERP system and the warehouse

Assembly
In the case of ready-to-install systems, you no longer have to bear the time and expense of assembly. You receive a completely assembled, tested and documented system, which Festo can also install and commission for you, if needed. All in all: maximum reliability with regard to function and optimally adjusted settings.

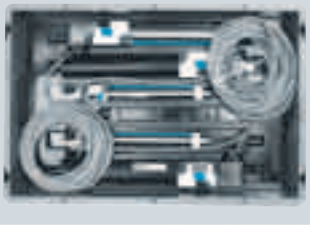
Festo – your partner for:
- Assembly of individual components
- Installation
- Test runs
- Preparation of documentation

Operation
Economy and 100 % system availability – this is precisely what our broad range of services is targeted at. From service contracts for preventive maintenance through replacement part and repairs service to a variety of energy saving service and condition monitoring systems.

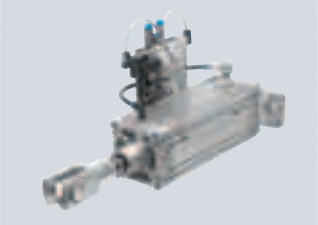
Optimised systems operation:
- Maintenance and repair
- Reduced energy consumption
- Continuous monitoring of critical processes



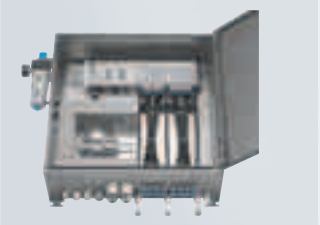
Additional information on this topic is included in the brochure entitled "Customer-specific solutions".



PrePack service: pre-packed standard components



PreAssembly service: pre-assembled modules



Control cabinet as ready-to-install solution

For services related to the topics see . . . . . page
Energy Saving Services 57

Innovation – a future based on nature

Learning from nature – Festo explores new technologies and implements them in the field of automation within the framework of the Bionic Learning Network. Energy-efficient "green" manufacturing is a key issue in this respect.

Something new and efficient: AirPenguin, a group of autonomous, flying penguins. Inspired by this: the prototype of the BionicTripod with adaptive gripper, namely the FinGripper.

The advantages of the BionicTripod as compared with conventional handling units are the large working area and high levels of energy efficiency which are the result of its lightweight design.

The advantages of the adaptive gripper: variously shaped workpieces can be reliably gripped with the adaptive gripper which is manufactured using a laser sintering process.

Flexible motion, as seen in nature

The flying AirPenguins glide autonomously within a given space, which is demarcated by “ultrasonic lighthouses”. The head and tail sections are equipped with a flexible 3D-Fin Ray® structure. This design feature has been derived from the functional anatomy of fish fins. It enables the head and tail sections to move in any direction.

The rapid, precise control demonstrated by the AirPenguins is fascinating as well: flying as a flock, altitude control, pressure compensation, temperature compensation, positional stability without colliding. In the same vein, our new proportional pressure valves VPPM and VPWP for servo-pneumatics are also distinguished by world class control technology.

Fin Ray Effect® is a trademark of EvoLogics GmbH in Berlin

Trend towards freedom of motion

Flexibility, lightweight design in relation to the moving load and energy efficiency are becoming more and more important in the field of automation. The prototype of the flexible tripod developed by Festo makes effective use of the Fin Ray® principle for the first time for these new requirements in automated manufacturing processes.

Three fibre-glass rods arranged in the shape of a pyramid can be deflected up to 90° in any direction by pulling them out and pushing them in. Struts placed at regular intervals render the construction rigid. They’re precisely controlled and deflected by electric linear axes. Control of the entire system is managed by robot control software CMXR.

The future of adaptive gripping with the FinGripper

The prototype of the gripper consists of a pneumatic actuator in the form of a bellows and three gripper fingers with Fin Ray® structure. Two flexible bands come together at the tip like a triangle. 5 intermediate stays are connected to the bands. This enables the gripper fingers to adapt themselves to the contour of the workpiece thanks to the flexible but firm structure when pressure is applied from the side.

Adaptive gripping can be used successfully in many applications, for example in the food industry for simple sorting of products with different sizes and contours. This adaptive capability is also ideal for pressure sensitive parts, which have to be moved and placed without causing any damage.

The bionic penguins illustrate what learning from nature means. Through the use of innovative materials and the creative combination of various designs and functional concepts, new opportunities for creativity can be opened up and made useful for automation technology.

For products related to the topics see ..... page
Electric tripod 29
Robotic controller 31
Proportional directional control valve 35
Proportional technology on fieldbus 38

Festo Didactic – advantage through knowledge

We make you fit for work with our new seminars on electrical engineering and the process industry.

Make your company and your employees fit for a dynamic future by means of training and vocational education. Innovative new training systems and highly practical seminars covering the topics of electrical engineering and process automation, as well as current focus events, hone your company's competitive edge. And you benefit directly from innovative, top quality educational products and training services as a result.

Electrical engineering: from the basics to a complete training centre
Industrial products and processes for rendering services are becoming more and more complex; modern drive technology is characterised by an increased merging of electrical and mechanical components into flexible drive systems.

Intended for engineers, electricians and mechatronics technicians, the new seminars cover the topic of "electric drives" and convey the technical knowledge which is specially matched to actual needs.

Completely new: learning systems for electrical engineering and electrical systems for training in companies, in schools and at universities. From the basics to learning factories for universities and research departments, so that you can provide tomorrow's technical personnel with the best possible prospects.

Process automation: measuring, open and closed-loop control of industrial processes
Learning at the highest level and fully up-to-date. Trainers and consultants share their technical knowledge and practical know-how using ultra-modern process valves and components from Festo and other manufacturers.

Whether process valve technology, industrial measuring technology, instrumentation or control circuits are involved – the new seminars provide practitioners with solutions to their daily challenges.

The new learning systems provide a complete learning environment for communicating the basics to all new technical staff. The industrial components, used in a controlled atmosphere, are ideally suited for the rapid transfer of new knowledge to industrial practice!

New machinery directive
Do you operate or manufacture systems? If so, the new machinery directive applies to you! We prepare you thoroughly for changes taking place in the field of safety engineering at our focus event entitled "The new 2006/42/EC Machinery Directive and the new EN ISO 13 849-1 standard in the fields of pneumatics and electro-pneumatics".

Compact and focused – during this one-day seminar you'll discover every aspect of the new directive and discuss any issues and questions it raises.

Energy efficiency
Further focus events will also be held during 2009 and 2010 addressing the key issue of "energy efficiency".
Interested? We'd be happy to provide you with additional information!

Further information
Further seminars on page 58
Learning systems: www.festo-didactic.com
Training and consultation: www.festo-tac.com

Stainless steel round cylinder CRDSNU

Easy-to-clean stainless steel cylinder range with numerous mounting options and a large assortment of variants. The latest generation of the CRDSNU is distinguished by innovative technological solutions, for example the completely redesigned, extremely durable, dry-running seal and self-adjusting cushioning without adjusting screws – for exceptionally easy cleaning.

Benefits
- Modular cylinder system with many variants
- Dimensions largely to ISO 6432
- Laid-out consistently in accordance with clean design criteria
- FDA approved lubrication and seals in the basic variant
- Good corrosion resistance even under aggressive ambient conditions
- Long service life with optional dry-running seal
- Quick replacement of the piston-rod scraper via split bearing cap
- Available with self-adjusting PPS end-position cushioning

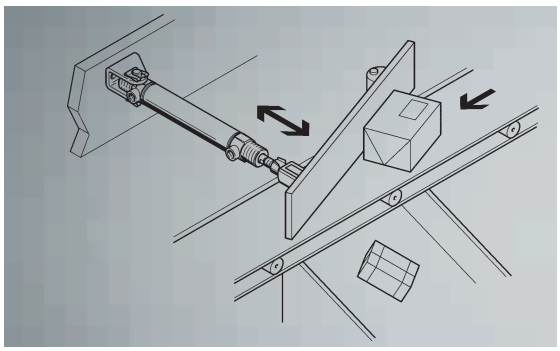
Round cylinder DSNU-PPS with self-adjusting cushioning

Unbeatable in its own performance class: DSNU-PPS round cylinder with self-adjusting pneumatic cushioning. Reduced installation time and easier assembly result in enormous time saving – and the cylinder is always perfectly adjusted. It advances dynamically, but nevertheless gently, into the end position without any manual intervention.

Benefits
- Self-adjusting for constant, ideal settings even with changing loads and/or speeds
- Inadvertent erroneous adjustment is entirely excluded
- Also available as CRDSNU-PPS stainless steel cylinder

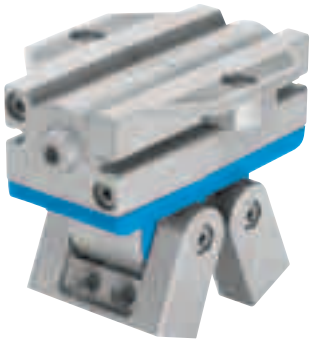
A sample calculation of the potential savings with PPS cushioning:
An installation for sorting packages consists of 60 stations, each with one DSNU round cylinder, making 60 cylinders in all. This saves up to 5 minutes in installation and set-up time per cylinder. Given that a total of 60 cylinders are installed, the total potential savings are 300 minutes or 5 working hours.

Ideal for use in the food zone thanks to easy-to-clean stainless steel



DSNU-PPS: different weights – always uniformly adjusted

Radial and angle grippers HGRC/HGWC



Compact design, attractively priced, flexible and reliable. The new HGRC/HGWC radial and angle grippers with 3 different opening angles and sizes round out Festo's comprehensive gripper portfolio. The new, technically optimised design ensures an excellent price/performance ratio with impressive functionality. The HGRC/HGWC has a piston drive which uses a rack-and-pinion system to convert linear motion into radial motion. This means that a constant gripping force is available throughout the gripper movement.

Benefits

- Optimum cycle times: 3 different maximum opening angles of 180°, 80° and 30°
- Attractively priced solution for most of the standard applications: 3 different sizes 12, 16 and 20 mm
- Simple and flexible: one type of gripper can be used for both inside and outside gripping of workpieces
- Integrated into the Festo modular handling system
- Main applications: series production of highly cost-effective machines and palletising and transferring of simple workpieces up to medium size and weight

Parallel gripper HGPT-...-B

Sturdy, powerful and especially lightweight thanks to the systematic selection of materials used: the new HGPT-B with gripping force retention, sealing air and 4 sensor slots. Perfect for applications in harsh machine manufacturing because the gripper automatically keeps harmful particles at a distance and its sensors are mounted flush with the housing or the slot.

Benefits

- Up to 25 % more gripping force than before, high-force variant with twice the force and half the gripping stroke
- Sturdy, precision kinematics for outstanding torque resistance and long service life
- Reliable gripping thanks to the T-slot guide, even with high torque loads
- Integrated sealing air allows for use in harsh environments
- 4 sensor slots for up to 4 flush mounted sensors
- No dropping of workpieces thanks to optional gripping force retention

Technical data

- 8 sizes with forces from 85 to 3,175 N
- Force variant: up to 7,080 N with half the stroke length
- Repetition accuracy of all sizes and variants: ±0.03 mm

High performance and economy in the tightest of spaces

Sturdy and reliable for any application

Low-temperature unit for the process automation

Ideal for reliable operation of butterfly valves in cold, outdoor areas at temperatures of down to –50 °C.

Benefits
- Ready for use thanks to matching components
- Standard interfaces for the attachment of all process valves
- Large optical display is easy to read, even at considerable distances
- Robust design, resistant to mechanical influences
- Explosion protection for zone 1

Technical data
- Semi-rotary actuator based on Scotch yoke concept:
  Single-acting: 15 to 2,880 Nm (at 5.6 bar)
  Double-acting: 8 to 5,760 Nm (at 5.6 bar)
  Adjustable end positions
- Namur valves:
  Two 3/2-way valves in a single housing
  Two secure manual overrides
- Sensor box: position detection with micro-switch
- Switching position indicator: highly visible design

Reliable use at down to -50 °C

Quarter-turn actuator DFPB for the process automation

The DFPB series is the logical further development of the DRD/DRE series. The result is a cost-optimised range with innovative detailed solutions.

Benefits
- Compact design
- One housing for double and single-acting drives
- Constant torque characteristics
- Long service life: low wear thanks to an innovative pressure-dependent lip seal
- Clockwise and anticlockwise operation, thanks to the connection for process valves on both sides as per ISO 5211
- Can be used on nearly any process valve thanks to torque gradation

Technical data
- Rotation angle and adjustment up to 94°
- Shaft made from anodised aluminium
- End caps coated with aluminium epoxy
- Highly corrosion-resistant (CRC 3)
- End-position adjustment in all sizes with lock nuts encapsulated and sealed externally as well as internally
- Self-lubricating and excellent emergency running properties thanks to carbon-containing slip bands (30 % carbon)
- Octagonal connection to process valve

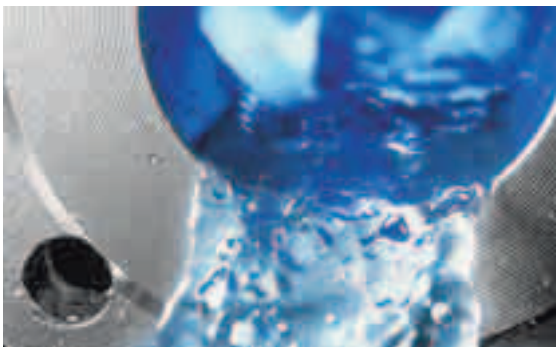
For new solutions in process automation

Controlled actuator DFPI for the process automation

The controlled actuator DFPI has been designed for use in process automation with all types of linear-actuated process valves. DFPI: perfect for controlling knife gate valves and sluice gates.

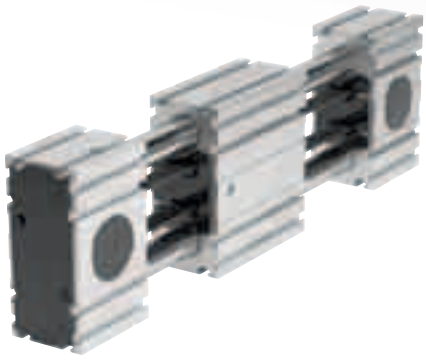
Benefits
- All in a sturdy and compact housing, designed for use outdoors
- High IP protection
- Highly corrosion-resistant
- Easy commissioning due to self-initialising
- Quick and easy integration into existing control architecture with actuation via PLC
- Individual adjustment of forward and return movement speed in both end positions thanks to flow control function
- Optional sensing of intermediate positions by using Festo proximity switches

Technical data
- Linear actuator with integrated displacement encoder, valve manifold and positioner
- Displacement encoder via linear potentiometric displacement sensor
- Series with diameters of 100, 160, 200, 250, 320 mm are available
- X-lengths up to 1,000 mm are possible



DFPI – regulated actuator for extreme conditions

Electric axis ELGR



For simple automation tasks and, at the same time, a long service life of 5,000 km. The electric toothed belt axis with cost-optimised design is the first choice where only comparatively minimal requirements need to be fulfilled with regard to load, dynamics and precision.

Benefits
- Motor can be mounted at any desired position with identical mounting accessories for any installation situation
- Also suitable for use with motors from other manufacturers thanks to open motor interface
- Variants available with long slide, as well as with up to two additional slides, for high loads and better guide performance
- Complete kit for simple, space-saving end-position sensing ensures reliable operation
- Quick commissioning after simple axis layout with the help of PositioningDrives software, as well as predefined parameter sets included in FCT configuration software

Technical data
- 3 sizes with strokes of up to 1.5 metres
- Maximum speed of up to 3 metres per second
- Repetition accuracy of all variants: ±0.1 mm

Flexible interface to all motors

Electric spindle axes EGSK/EGSP

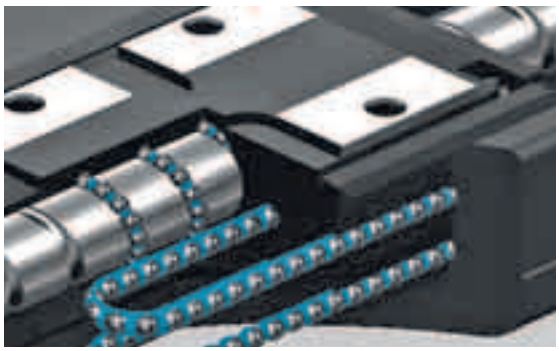
For highly precise and space-saving applications: linear axes EGSK and EGSP. The EGSK version comprises a spindle axis with recirculating ball bearing, and EGSP has a spindle axis with an innovative caged ball chain. Both have an extremely compact design. Spindle axis and recirculating ball bearing guide – the proven principle for precision and excellent running characteristics.

Benefits

- Higher process quality and thus efficient systems: repetition accuracy up to 10 µm
- Quieter running, less noise, longer service life and service intervals thanks to ball bearing chain
- Optimum use of space and appealing design: its compact dimensions and high mechanical rigidity are impressive
- Compact sensing with SIES-8M sensor in profile slot
- Part of the modular mechatronic multi-axis system with compatible interfaces
- Efficient in combination with servo motor EMMS-AS and motor controller CMMP-AS. Or the ServoLite stepper motor EMMS-ST and motor controller CMMS-ST

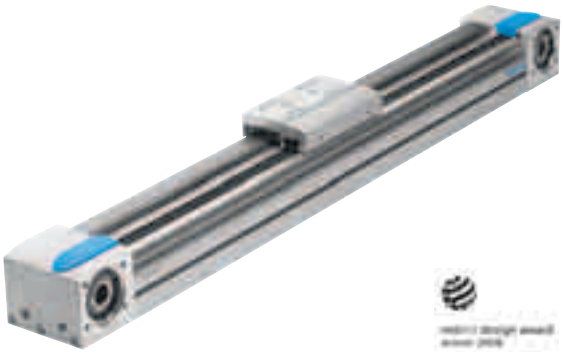
Technical data

- Spindle axis in 5 sizes with strokes of up to 800 mm
- Positioning accuracy down to 3 µm



Innovative and highly precise: EGSP with ball bearing chain

Electric linear axis EGC



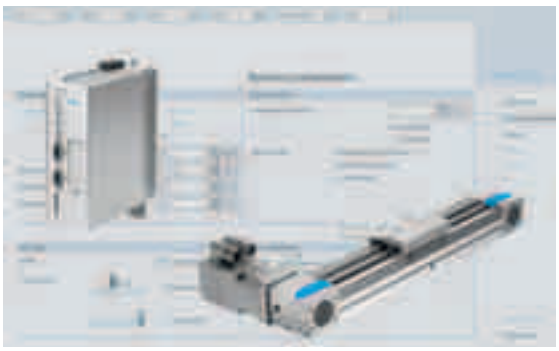
The electric linear axis EGC with recirculating ball bearing guide: maximum dynamic response and speed with improved rigidity. Toothed belt drive for maximum dynamic response or spindle drive for high precision; suitable for all motor types.

Benefits

- Increased load capacity and greater torque resistance due to more rigid aluminium profiles and externally located bearing guide – reliable due to an additional wiper seal
- Downsizing option: use of smaller sizes for same loads
- Easy standardisation, warehousing and logistics: motor connection on the right and left side and on both ends of the axis. Including option for subsequent conversion
- Additional gear unit is not needed due to the small drive pinion
- Harmonised interfaces for mechatronic multi-axis modular system
- Safety with integrated sensors and optional emergency buffers

Technical data

- Toothed belt axis in 5 sizes with strokes of up to 10 m
- Spindle axis in 4 sizes with strokes of up to 3 m
- Maximum speed of up to 5 metres per second
- Maximum feed force of up to 3 kN



Quick and easy layout with PositioningDrives

Linear motor axis with air bearing ELGL-LAS

Maximum precision and linearity: a linear motor axis with an integrated displacement encoder and air bearing. Its magnetically preloaded air bearing acts as a holding brake. All in one: linear motor, displacement encoder and guide. The ELGL-LAS should be your axis of choice whenever horizontal and vertical positioning are required together with highly dynamic operation and maximum precision.

Benefits
- Precision and very long service life thanks to air bearing which ensures excellent positioning accuracy and linearity. Maintenance-free because none of the moving parts are in contact with each other. The system requires neither grease nor oil
- High levels of safety even with vertical applications. The magnetically preloaded air bearing acts like an integrated locking brake
- The air bearing provides maximum protection against dirt; dry and non-adhesive particles are simply blown away
- The design principle enables independent movement of several carriages on one axis

Areas of applications
- Electronic, semiconductor and photovoltaic industry, measurement systems
- Scanner applications, medical technology

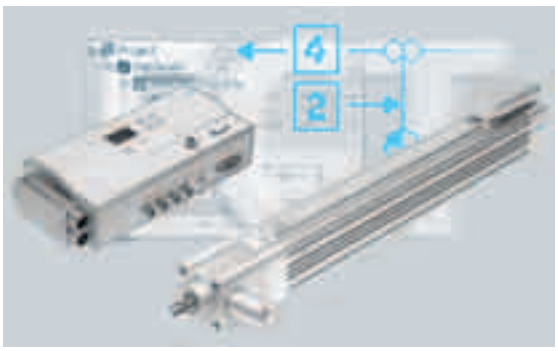
Dynamic and reliable: air bearing as locking brake

Electric linear motor cylinder DNCE-LAS

Top performance with short positioning times. A highly dynamic complete system for small loads in combination with the motor controller SFC-LACI: ideal in the electronics industry and for small parts assembly.

Benefits
- Festo plug and work® for clear-cut logistics and quick assembly. All the required components such as linear motor, displacement encoder, guide and reference switch create a ready-to-use axis
- External power electronics with the motor controller SFC-LACI with IP54 protection: freely adjustable speed, force and position, as well as various connection options via I/O or fieldbus
- Configuration and commissioning with the Festo Configuration Tool (FCT): Just enter the parameters and the position sets and you're ready
- Long service life and nearly maintenance-free operation: Internal plain-bearing guide with integrated grease reserves reduces maintenance costs and downtime to a minimum

Technical data
- 2 sizes with strokes of up to 400 mm
- Peak force of up to 257 N
- Repetition accuracy of all variants: ±20 µm



Cylinder with clamping cartridge and position controller, configured as a complete system

Guided linear motor cylinder DFME-LAS

Complete system for small loads – dynamic, precise and with minimal positioning times. A powerful duo: electric guide axis with linear motor DFME-LAS and motor controller SFC-LACI. Ideal in packaging technology and small parts assembly.

Benefits
- Festo plug and work® for trouble-free logistics and assembly. All the required components, such as linear motor, displacement encoder, guide and reference switch create a ready-to-use axis
- External power electronics with the motor controller SFC-LACI with IP54 protection: freely adjustable speed, force and position, as well as various connection options via I/O or fieldbus
- Festo Configuration Tool (FCT): Just enter the parameters and the position sets and you're ready
- Long service life and maintenance-free operation: internal plain-bearing guide with integrated grease reserves for minimal maintenance costs and reduced downtime

Technical data
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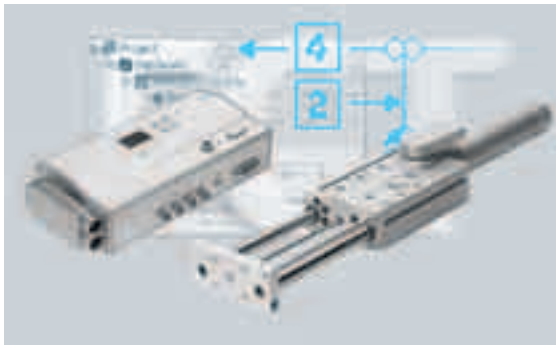


Quickly configured and ready to use

Electric handling module HSW-AE

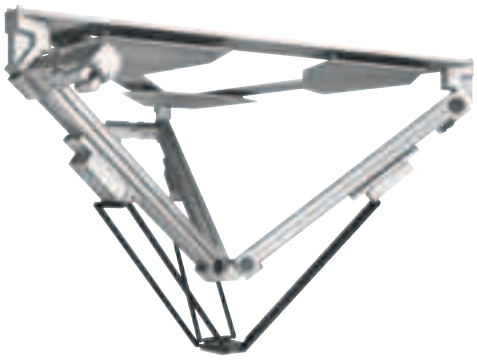
A complete, ready-to-install pick and place solution. The HSW handling module turns small parts through 90° and has an active wait position in both end positions. The HSW is guided via a slotted guide plate with adjustable angle, a linear guide and a rotary bearing. Driven and controlled by the motor controller MTR-DCI, including teach-in function. Freely programmable position, speed and torque.

Benefits
- Up to 100 parts per minute and a cycle time of less than 1 second – high productivity guaranteed
- Optimised cycle time thanks to active wait position for the pick as well as for the place position
- Optimum adaptation to the application via independent precision adjustment of both linear strokes: cost and space optimisation
- Easy adaptation to inclined linear conveyors by means of angular adjustment
- High repetition accuracy of ±0.01 mm due to shock absorber with metallic stop for lower noise levels: optimised process quality
- Directly integratable in installations as a complete solution with motor controller and integrated gear unit

Range of applications
- Small parts handling
- Pick and place applications with ejector function

High-speed transfer at right angle

Electric tripod
EXPT



Tripod kinematics enables free motion in 3D space. Ideal for high-speed handling of loads of up to several kilograms. The setup consists of three securely mounted linear axes in the form of a closed pyramid and offers good rigidity and stability with minimal moving loads. This concept guarantees high dynamics with large effective loads.

The robot controller CMXR combines the mechanism and the electric drive technology into a kinematic system solution and coordinates highly dynamic motion in 3D space.

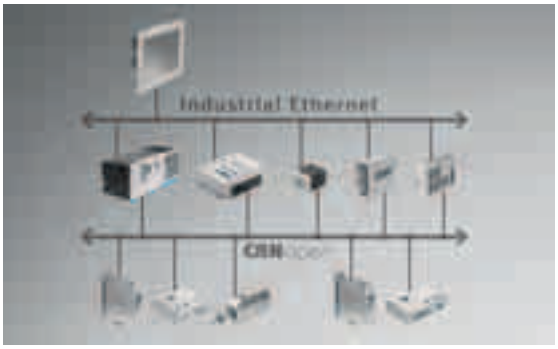
Benefits
- Complete system service from engineering to commissioning, thanks to Festo plug and work®
- Maximum acceleration of 50 m/s² and speeds of up to 3 m/s with a load of 1 kg
- Load capacity: effective loads of up to 5 kg
- Variable: 3 standard sizes offer working spaces with diameters of up to 700 mm and heights of up to 250 mm

Controller and system: cartesian or as tripod

Modular controller
CECX

The modular controller CECX expands Festo's controller range to include fieldbus master functions and electric actuation options in the upper segment. Certified by CE, UL and CSA.

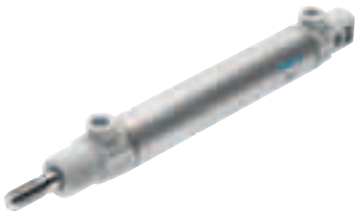
Benefits
- As a functional controller for machines and systems, the CECX enables implementation of extensive PLC functions, as well as multi-axis motion with interpolation at the same time
- For controlling electric drives with the CANopen fieldbus interface, the CECX offers a high performance programming environment as per the IEC 61131-3 standard, with the help of CoDeSys software and the SoftMotion module – including module libraries, configuration tools and drivers
- Compatible with a great variety of control architectures thanks to fieldbus master interfaces: CAN-bus on board, Profibus master DP V1, Profibus slave DP V1
- Modular: digital and analogue periphery modules, increment generator input modules (encoder, SSI interface), temperature input modules



Numerous communication modules

Product range expansions and add-ons
Drives

Round cylinder DSNUP
Simply inexpensive: the new range of round cylinders to ISO 6432 with aluminium barrel and polymer end caps. Ideal for simple automation tasks or clamping and retaining functions.

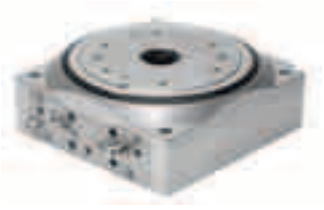


3-jaw T-slot gripper HGDT-F
Extensively tested and optimised for harsh ambient conditions. Reliable thanks to sealing air and integratable proximity switches: the gripper range HGDT with new force variants for gripping forces of up to 4,000 N.

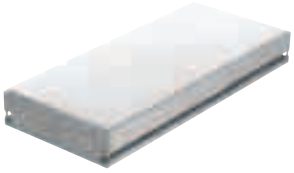
Swivel module DSM-B
Sturdy and precise: semi-rotary vane drive DSM-B with good repetition accuracy and space-saving sensor technology for freely adjustable angles of up to 270°, also with precision adjustment. Now with new cushioning.

Stopper cylinder DFST
The sturdy stopper cylinder with adjustable cushioning: stops loads of more than 1 kg and even heavy weights of up to 800 kg, gently and free of vibration. Also ideal for separating or for high-speed transfer systems.

Pneumatic rotary indexing table DHTG
Compact, with reciprocating motion and now with new flex-motion plate. There's always room for the DHTG rotary indexing table at semi-automated machines and pick and place buffers, as well as for swivelling and separating tasks.



Air bearing ATBT
The ATBT air bearing transports photovoltaic and display substrates in a contactless, gentle and extremely precise manner. Including minimal air consumption.

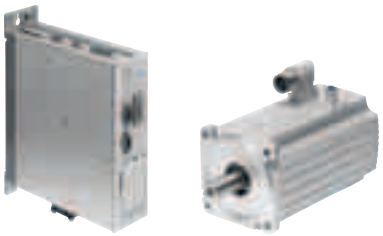


Electric rotary module ERMB
Dynamic and flexible rotary motion – freely positionable. As a front unit, the rotary module ERMB enables loads of up to 15 kg to be rotated to any desired angle up to 360°. Or it can be used as a small, stationary, numerically-controlled rotary table.

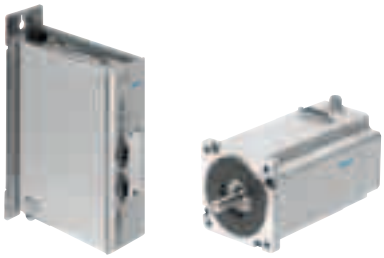
Electric spindle-driven cantilever axis EGSA
High dynamics and best possible repetition accuracy are integrated, in particular with short strokes. The electric cantilever axis demonstrates these strengths thanks to its spindle drive and long guide.

Electric T-slot gripper HGPLE
Flexible because it's freely positionable and controlled thanks to speed monitoring. The latest generation of electric grippers HGPLE is characterised by these features thanks to actuation via the motor controller SFC-DC – directly on-site!

Servo motor EMMS-AS and motor controller CMMx-AS
Perfect interaction: The servo motor EMMS-AS at its best either with highly dynamic motion and cam-disc actuation with the extremely functional controller CMMP-AS, or with the standard controller CMMS-AS, e. g. for positioning tasks with I/O interface.



Stepper motor EMMS-ST and motor controller CMMS-ST
ServoLite: full servo-performance for stepper motors – attractively priced for more precision and increased dynamics thanks to closed-loop operation. Including SD card slot at the controller or holding brake at the motor. Open loop as standard operating mode, communication with the master controller via the fieldbus.



Robot controller CMXR and teach pendant CDSA
Genuine 3D functionality for free contour control with up to 6 degrees of freedom. This is the heart of a complete kinematic system solution for handling technology – including additional I/O interface and fieldbus connection!

Integrated FED-CEC controller
Pure function integration and compact performance. The FED-CEC is Festo's space-saving control concept.

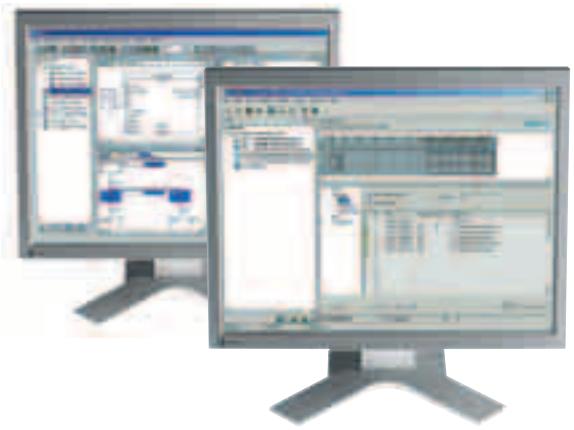
CPX-CEC-C1
CoDeSys integrated controller for CPX

Program, automate and reap the profits – based on IEC 61131-3. Mounted directly on the machine as an intelligent remote I/O terminal with IP65/IP67 protection, the CPX-CEC-C1 reduces installation costs and is ideally matched for the CPX terminal, as well as motion applications with up to 31 electric drives. All in all, a performance advantage thanks to shortened cycle times and a greater number of connectable actuators.

Benefits
- Very flexible: modular I/O system, up to 512 I/O, CAN master functions
- Diagnostics and condition monitoring: comprehensive CoDeSys functions library
- Stand-alone open and closed-loop control: economical automation, e. g. for manual workstations
- On-site remote control: preprocessing at all common fieldbus/Ethernet protocols
- Universally unique, all-encompassing automation platform in IP65: for standard, proportional and servo-pneumatics, sensor technology and motion control with up to 31 electric drives

Integrated into the CPX electrical terminal: CoDeSys software

CPX terminal visualisation and diagnostics support with FDT/DTM, OPC server



New software modules support programming and simplify engineering. Human resources are too valuable to spend as much as 60 % of that time on diagnostics and condition monitoring during process automation and the manufacturing process. There's another way: integrate CPX into a FDT frame application or an OPC server.

FDT/DTM support at Profibus

- Investment security: compatible with existing and future CPX versions
- Operating convenience: device status, diagnostic information and I&M data are accessed with just a few mouse clicks
- Reduced workload for routine tasks: bus configuration and Profibus start-up parameters can be transferred in combination with DTM host systems

OPC server support at Ethernet
- Manufacturer independent communication: per OPC standard
- Quick project implementation: lower engineering and commissioning costs
- Parameterisation instead of programming: without extensive knowledge of pneumatics
- CoDeSys library for diagnostics and condition monitoring: for customer implementation or as a service provided by Festo

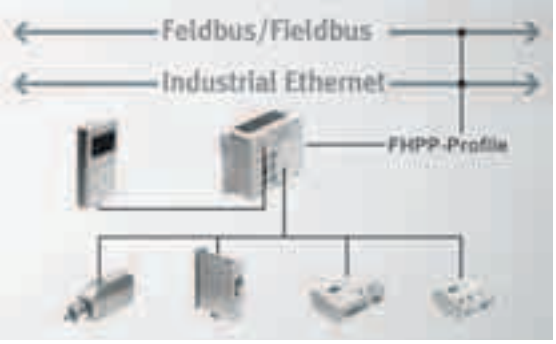
Visualisation and diagnostics – simpler and more economical

FHPP interface: CPX-CM-HPP for electric drives

Power play at all fieldbuses: uniform control of up to 4 Festo electric drive units with the Festo handling and positioning profile (FHPP) via fieldbus gateway. Ideally suited for integrating individual axis applications (point-to-point, asynchronous) at fieldbus/Ethernet. Including quicker commissioning and reduced downtime.

Benefits

- Highly flexible: compatible with all of Festo's electric drive units
- Simplified engineering: quicker commissioning, reduced downtime, uniform control
- Less complexity: no programming of the CPX-CM-HPP module is required
- Better diagnostics: based on plain text error messages, read-out of the actual position and more
- Highly economical: up to 4 individual axes per module (8 in the system) can be controlled



Uniform control of electric drive units

CPX-SF34/35 PC Worx integrated controller for CPX

Stand-alone control and comprehensive communication: the CPX-SF34/35 is economical thanks to comprehensive function integration into Festo's valve terminals. Ideal for automating manual workstations and for networking autonomous subsystems or machine cells, for example in the automotive industry.

Benefits

- Stand-alone open and closed-loop control via consistent, easy to handle control concept
- Modular I/O system with IP65 protection, saves on installation space with up to 512 I/O without control cabinet
- Improved efficiency in engineering thanks to seamless integration into existing solutions with PC Worx and Profinet (remote control)
- CPX-SF34/35 was developed in close cooperation with Phoenix Contact and has a range of performance features similar to those of the ILC 150 ETH controller

Processing speed	1.5 ms per 1,000 operations
Program/data memory	256/256 kbyte
Remanent data memory	4 kbyte
Data access	OPC server
Ethernet TCP/IP or Profinet with integrated switch	
PC Worx programming package (suite 1.50) to IEC 1131	
Programming languages	AWL/IL, FB, KOP, SPC, ST
Connection technology • CPX-SF34 • CPX-SF35	AIDA conformant • 2 x RJ45 (Push Pull FO) • 2 x SCRJ (Push Pull FO)
Protection class	IP65/67

Position controller CPX-CMAX for pneumatic drives

Unique worldwide: the position controller CMAX.
Only the CMAX controls different pneumatic drive ranges – both linear and rotary – as a module on a valve terminal. The dynamics, force and flexibility of the pneumatics can thus be applied to several positioning tasks. Position controller CMAX is more economical and reliable thanks to auto-identification and comprehensive diagnostics.

Benefits
- Faster processes, higher productivity
- Positioning and force control in one work step
- Cost-effective positioning system for heavy-duty applications

Data and areas of application
- Travel speeds up to 3 m/s
- Acceleration values up to 30 m/s²
- Accuracies of ±0.2 mm
- Loads from 1 kg to 300 kg
- Strokes of up to 2 m (drive-specific)
- Up to 8 axes per CPX terminal

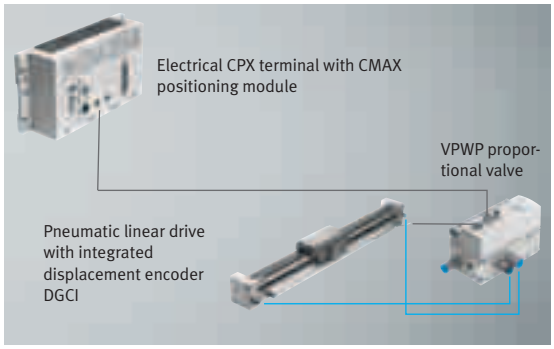
Soft Stop CPX-CMPX for pneumatic drives

CPX terminal CMPX-C-1-H1: electronic end-position controller for pneumatic drives. Soft Stop enables pneumatic drives to brake gently and then to accelerate faster. The function of the end-position controller CMPX-C-1-H1 corresponds to the Soft Stop system SPC11.

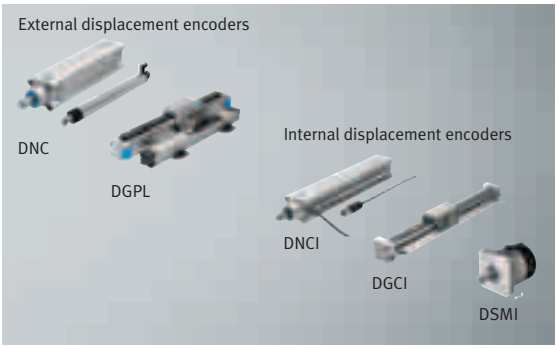
Benefits
- A reduction of approx. 30 % in both travel times and air consumption compared with standard pneumatics
- Increased cylinder service life
- No vibrations when returning to the end positions
- Suitable for use with all fieldbuses/Ethernet and FEC available in CPX
- Easy commissioning, Festo plug and work®

Data and areas of application
- Time and vibration-critical applications with working loads from 1 to 300 kg
- Strokes: drive-specific, up to 2 m
- Accuracy: precise in the end positions via fixed stop, ±2 mm in the intermediate positions

New functions
- Digital data handling
- Reliable pressure regulation due to cascade controller
- Two recordable intermediate positions
- Brake output at the VPWP proportional valve



Function and system integration for CMAX and CMPX



Wide range of combination options for CMPX/CMAX

Proportional directional control valve VPWP for servo-pneumatics

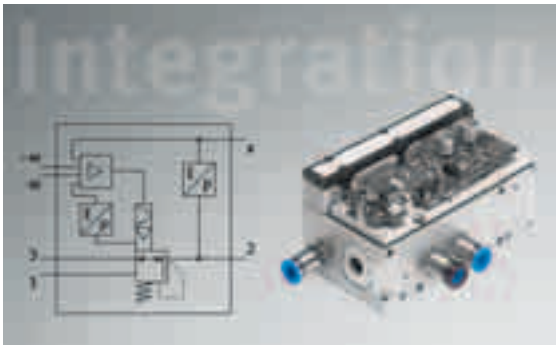
Teamwork for maximum servo-pneumatic productivity: proportional directional control valve VPWP with integrated serial interface for the servo-pneumatic positioning system CPX-CMAX and the Soft Stop controller CPX-CMPX.

The new functions
The new VPWP is based on the already popular valve MPYE with 5/3-way function for varying the direction of movement.

Multi-sensor control
- Integrated pressure sensors and cascade control for excellent control results and reliable control behaviour
- Best possible positioning characteristics with speed and acceleration ramps

Additional functions
Digital switching output for controlling
- a shut-off valve or
- a directional control valve for a clamping unit

Benefits
- Security: fully digitalised data transmission
- Precision: multi-sensor control
- Sustainability: adaptive “self-tuning” control algorithm
- Quicker installation: auto-identification
- Productivity: comprehensive diagnostic capability



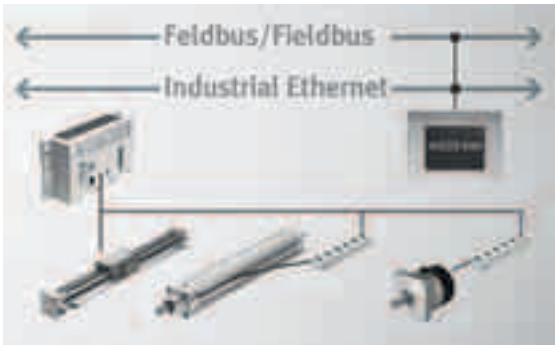
Integrated cascade control for maximum precision

CPX terminal measuring module CPX-CMIX-M1-1

Turning pneumatic cylinders into sensors. Unique worldwide: complete digital data acquisition* and transmission. Highly efficient: measuring is carried out while retracting/advancing with a repetition accuracy of ±0.01 mm through the use of analogue as well as digital transducers. CPX can be seamlessly integrated into existing control environments thanks to the electrical periphery.

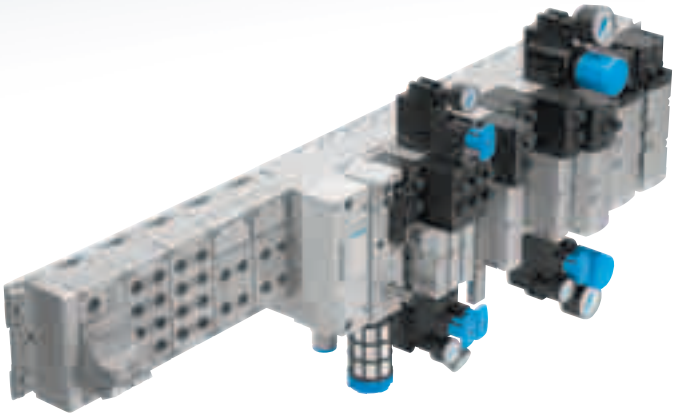
Benefits
- Saves time and space: retracting/advancing and measurement in a single work step
- Shorter cycle time: downstream process steps can be triggered in a stroke-dependent fashion
- Improved quality: process steps are measured and documented
- Enhanced precision: adjustable contact pressure regulator (“measuring stylus”)
- Accelerated, secure commissioning: coordinated system
- Reduced system costs: simple integration of functions at fieldbus/Ethernet as part of the modular electrical terminal CPX

*depending on the displacement encoder



Different drives and displacement encoders – uniform system architecture

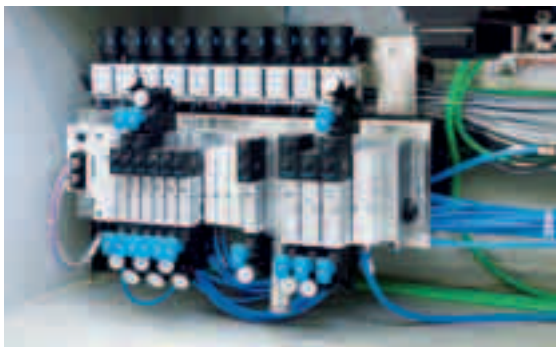
Standard valve terminal VTSA and electrical terminal CPX



Unique worldwide and the best in every class – now even up to ISO size 2 (52 mm) and with 4 valve sizes on a single valve terminal. Expanded to include the metal variant of the CPX terminal, opening up new perspectives for use in tough applications with simultaneous function and system integration.

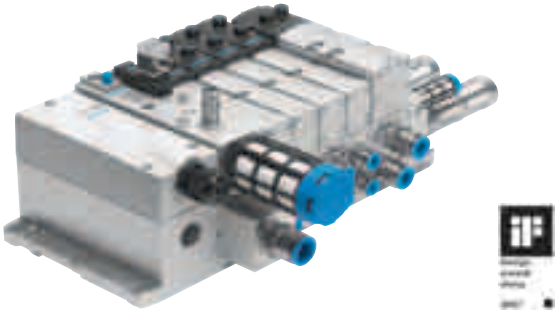
Standard valve terminal VTSA
- Unique: 4 valve sizes integrated onto a single valve terminal – without adapter!
- High flow rates: up to 3,000 litres per minute with ISO size 2 (52 mm) and 30 % higher flow rates than specified in the standard with the VTSA-F
- Standardised: 100 % ISO 15407-2 and ISO 5599-2
- Safety@Festo: with integrated safety functions
- Flexible: complete vertical stacking range in all 4 sizes
- Complete installation solution
- Integrated: comprehensive diagnostics concept
- Adaptable: can be adjusted to all requirements and configurations

CPX terminal in metal variant
- Sturdy: new metal housing – ideal for use in all harsh environments such as heavy machine manufacturing, raw materials processing and the automotive industry
- Multifunctional: Profinet fieldbus nodes with 3 connection technologies and power supply in accordance with AIDA



Concentrated performance

Safety@Festo: valves VTSA for more safety

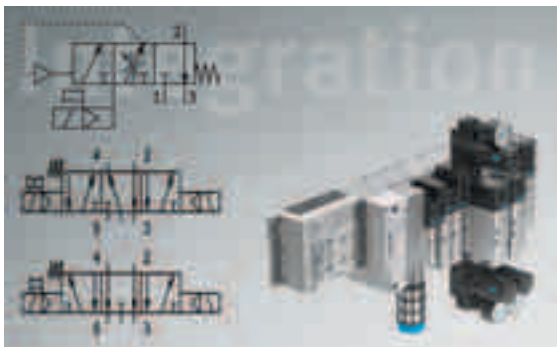


More safety integrated into the VTSA valve terminal: the electrically actuated on-off/soft-start valve VABF and new valves for applications with lifting and rotary cylinders, as well as with manual clamping devices. Quick to install, integrated solutions for fitting directly in the application, e. g. in the automotive industry.

On-off/soft-start valve
- Slow build-up of output pressure
- Downstream cylinders and working devices are thus slowly advanced to their initial positions
- Safety function: safe start-up of pneumatic systems/system parts
- Pressure build-up is optimised thanks to adjustment of switching pressure and filling time
- Separate pressure build-up for each pressure zone directly at the valve terminal if required

ISO valve for lifting and rotary cylinders
- VSVA-B-P53-AD-H-A1-1T1
- Safety function: stopping or blocking a motion (mechanically)

ISO valve for manual pneumatic clamp
- VSVA-B-P53-ED-H-A1-1T1
- Safety function (3 phases): force-free, self-locking, pneumatic operation – according to regulations specified for car body production



Safety function integrated into the VTSA/VTSA-F

Safety@Festo: valves VSVA/ VTSA for presses

Improve safety by using valves with switching position sensing, e.g. for actuating presses.

Benefits
- Standard and safety pneumatics from a single source
- Universal valve series up to 26 mm valves
- Ready-to-install solution on a single valve terminal
- Optional diagnostics options via fieldbus interface

ISO valves with switching position sensing
- VSVA-B-M52-MZD-A1-1T1-A
- VSVA-B-M52-MH-A1-1C1-A

Designed for integration into universal control architectures of a higher category. Piston spool position is detected with a proximity sensor.

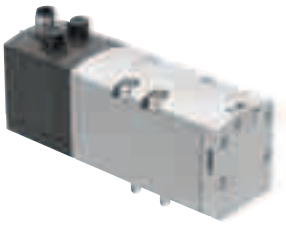
Available in 2 versions
- Plug-in, integrated into the VTSA/VTSA-F valve terminal
- CNOMO interface, 24 V DC, type C

ISO valve manifold for controlling presses
Consists of a double sub-base with 2 valves and 2-channel pneumatic linking, piston position sensing covered manual override.

Available in 2 versions
- Plug-in, integrated into the VTSA/VTSA-F valve terminal
- CNOMO interface, 24 V DC, type C

Switching position sensing, individual or 2-channel linking

Standard valves VSVA with M12 central connector



M12 central connector as standard equipment – now for all sizes of our sturdy VSVA standard valves per ISO 5599-1. User-friendly system, suitable for demanding pneumatic tasks with high levels of standardisation and automation.

Benefits
- Consistent valve concept for ISO valves, from individual valves to industrial Ethernet
- Flexibility: size 01 (26 mm) and size 02 (18 mm) with M8, M12 or square plug, type C connection
- Size-optimised pneumatic performance: from 42 mm (size 1) to a flow rate of 1,300 litres per minute
- Reading and controlling the cylinder force and pressure: manually, on-site – including pressure gauge
- Uncomplicated installation, even during system start-up
- Diverse range of vertical stacking components: pressure regulators as well as exhaust air flow control, compressed air supply and pressure shut-off plates
- Large exhaust air cross-sections and reversible regulators: 50 % higher exhaust air flow rate, shorter cycle times, longer service life
- Optional ducted pilot air for applications with excessive dust and moisture
- Safety@Festo: individual or 2-channel linked switching position sensing, e. g. for actuating presses

Consistent valve range from individual valves to valve manifolds

Add-ons, valves and installation technology for MPA

MPA functions for an extended application environment
- Continuous and reliable processes in special machine construction or in process industry
- Simplified assembly in control cabinets

Benefits

Pressure shut-off plate (hot swap)
- Valve replacement under pressure in continuous processes
- Greater safety for the plant operator
- Pneumatic drive is exhausted in a controlled manner

Manifold sub-base with integrated non-return valves
- Avoiding pressure peaks in pneumatic drives (for 3/2-way valves)
- Reliable and feedback-free reactive switching of pilot valves/pneumatic drives
- Up to 128 3/2-way valves, cost-optimised on a valve terminal
- 2 3/2-way valves with spring return

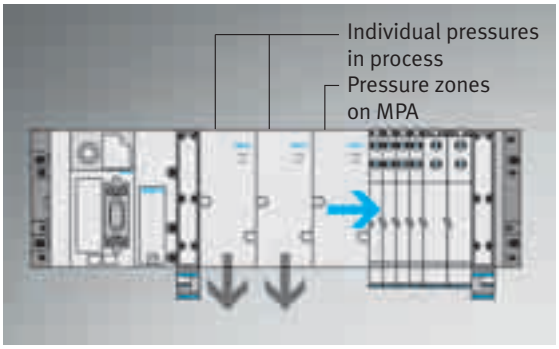
CPX/MPA offers you maximum modularity and flexibility for successful processes, including fieldbus, Ethernet and remote diagnostics.

Optimised for the process industry: CPX/MPA

Proportional technology on fieldbus VPPM-MPA

A unique combination of two leading technologies: proportional technology VPPM together with CPX/MPA.
VPPM-MPA has expanded the innovative technology platform CPX/MPA to include a wide range of pneumatic and electrical functions. Individual, modular and configurable at all levels.

Benefits
- 3 presets can be selected via CPX: fast, universal, precise
- Diagnostics on the fieldbus: All values, upper as well as lower limit values, can be remotely controlled and monitored via VPPM-MPA
- Individual pressure and force control at several actuators and processes by means of digitalised analogue values. Reliable and convenient communication via fieldbus/Ethernet
- Several MPA pressure zones: with the VPPM it is possible to create different pressure zones. Sequentially switchable even for multiple MPA manifold blocks
- Commissioning without fieldbus, via the handheld terminal CPX-MMI



Integrative pressure measurement and control

MPA-L valve terminal

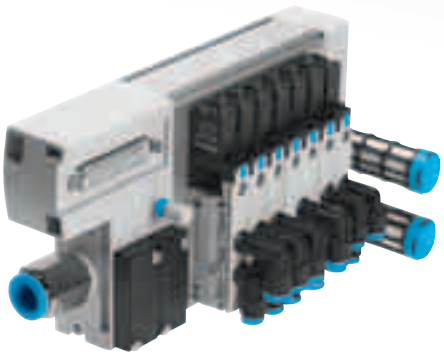
Improved strengths. The expert amongst the valve terminals, expanded with an even more flexible system for individual sub-bases: modular in small steps. Pneumatic performance is ideally adapted to any application, thus saving space and costs.

Benefits
- Modularity and flexibility
- Valves can be combined with each other or expanded at any time
- Different sizes can be included, thus allowing for various flow rates
- Parallel, internal valve linking
- Durability and inexpensive technical layout
- Very lightweight, corrosion-resistant sub-bases made of plastic
- Sturdy, durable end plates made of coated aluminium

Technical data
- Up to 32 valves/valve coils
- Numerous valve functions: 5/2, 5/3, 3/2, 2/2 and special functions
- Working ports: QS4, QS6, QS8, QS10
- Protection: IP67
- Multi-pin or CPX connection

Modular in small steps

Valves/valve terminals VB 12



From individual valves to a multi-pin terminal, the VB12 gives you enough room for individual configurations. Including great flexibility for planning, mounting and operation. Designed for universal and classic applications with an excellent price/performance ratio.

Benefits
- Excellent value for money
- Durable and sturdy valve system
- Easy installation and maintenance thanks to only one mounting screw
- Quick and easy replacement of fittings without tools
- Pneumatic distributor integrated on the valve terminal
- Manifold rails for up to 35 valve positions
- Space-saving solution with flexible expansion options

Technical data
- Valve function 3/2 NC, 3/2 NO, 5/2 single solenoid, 5/2 double solenoid (2 valve positions)
- Valve type: poppet valve
- Flow rate: 400 l/min
- Operating pressure range: 2.8 to 8 bar
- Temperature: -5 to +60°
- Power consumption: 1 W
- Protection: IP65

Excellent value for money

Valve terminal VTOC

The compact, flexible valve series VTOC is above all designed for use as a pilot valve only. Preferred use as a pilot valve for process valves in the semiconductor and process industry, for example for actuating gas valves. The valve series VTOC combines maximum compactness in a single valve manifold.

Benefits

- Very compact, space-optimised valve terminal
- Valve function in the smallest space
- Different electrical actuation options
- Each coil can be controlled via 2-pole connection
- Flexible due to configurable manifold rails, pneumatic as well as electric
- High process reliability due to integrated fibre optic system
- Optional: customised designs and adaptations
- Multiple functions: up to 48 3/2-way valve functions per valve terminal

Valve function	3/2-way NC
Valve type	poppet valve
Pneumatic connection	QS 3/4
Electrical connection	25 or 44-pin Sub-D
Ribbon cable	26, 40 or 50-pin
Flow rate	10 l/min
Operating pressure range	0 ... 8 bar
Power consumption	0.3 W with holding current reduction
Temperature	-5 ... +50 °C
Protection	IP40

Fast-switching valves MHJ

Unbeatably long service life: fast-switching valves MHJ. Designed for ultra-fast sorting applications of up to 1,000 Hz. Perfect for applications in which sorting via air jet function needs to be exceptionally fast. For example waste glass, PET shavings, used paper, rice, coffee, nuts.

Benefits

- Long service life >5 bn switching cycles
- Short switching times up to 1,000 Hz
- Good reproducibility

Technical data

- Flow rates: 50, 100 and 150 l/min
- Width/grid dimension:
  - Integrated electronics: 9/9.5 mm
  - External electronics: 10/10.5 mm
- Variants: as individual valve with integrated QS, sub-base valve or mounted on a customer-specific rail

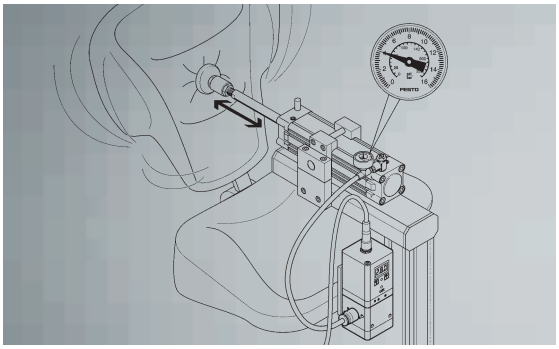
Max. service life with extremely short switching times

Proportional pressure regulator VPPE with display

Everything in view, everything under control, everything with an outstanding cost-benefit ratio. High performance, energy efficiency and ease of use provide the compact VPPE display with added value in a wide variety of basic applications.

Benefits
- User-friendly: digital display for indicating actual pressure or the setpoint, for displaying errors and for menu navigation
- Energy savings of up to 50 % are possible with automatic display shutdown. Once the setpoint is reached, no energy is required for maintaining pressure
- Convenient: 3 presets for ideal adaptation to different volumes – without any programming at all

Technical data
- Nominal flow rate
  600 l/min. – 2 bar, typical
  1,000 l/min. – 6 bar, typical
  1,500 l/min. – 10 bar, typical
- Pressure ranges: 0.02 to 2/0.06 to 6/0.1 to 10 bar
- Setpoint input: 0 to 10 V and 4 to 20 mA
- Actual value output: 0 to 10 V and 4 to 20 mA



Stable compressed air regulation for quality control

Pilot valve VOFC for the process automation

Thanks to their sturdy and massive design, as well as good corrosion resistance, these indirectly actuated valves are extremely well suited for use in chemical and petrochemical systems.

Benefits
- Sturdy and highly corrosion-resistant thanks to hard Ematal surface coating
- Tried and tested in actual operation in process automation: long product service life, reliability and safety, e. g. in Emergency shutdown applications
- Easy to combine the desired coil with the appropriate valve thanks to the armature guide tube
- Global explosion protection for zone 1 (ATEX, Nepsi, IEC etc.)
- Operation with internal and external pilot air
- Large temperature range: -25 to 60 °C
- In addition to standard connections (G1/4, NPT1/4, NAMUR), a combination of G1/4 ports and the NAMUR port pattern is also available.
- Reliable, robust design concept: poppet valve
- Minimal power consumption
- Actuation via fieldbus

Sturdy and corrosion-resistant

Product range expansions and add-ons
Valves and valve terminals

Ethernet nodes CPX-FB38 for EtherCat
Easy to integrate into Beckhoff TwinCAT automation environments, convenient and with minimal effort: four valve terminal ranges, CPX terminal and the installation system CPI. Nodes with two M12 D-coded Ethernet ports, integrated switch.

Input module CPX-4AE-TC for thermo elements
Hot? Cold? Too hot? Too cold? Knowing is reassuring. The temperature sensor modules CPX-4AE-TC provide many analogue I/O channels for recording temperatures from -270 to 1,820 °C, and for type B, E, J, K, N, R, S and T thermocouples. For use in process automation or manufacturing processes.

Multi-axis interface CPX-CMXX for electric drives
A good choreographer makes even the most complex movements appear easily – just like the CPX-CMXX. It doesn't just integrate up to 8 axes from multi-axis systems with IP65 protection into all common control systems, but also ensures shorter cycle times thanks to simply coordinated multi-axis motion. Its approach: simple and fast – installation and parameterisation with the Festo Configuration Tool (FCT).

Sensor interface CASM for servo-pneumatics
The CASM maximises the performance of your existing pneumatic positioning drives because it enables them to be controlled with the most up-to-date servo-pneumatic systems. All in all, the shortest possible link between existing displacement encoders with potentiometer and the new proportional directional control valves VPWP. For standard drives from Festo such as the DGP/L-... and the DNC-..., the linear potentiometer MLO-POT-...-TLF or -LWG, the DNCI and DSMI.

Valve terminal CPV10 for the process industry
2 3/2-way valves with integrated non-return function for reliable, non-reactive switching operations, especially in the process industry.

Proportional pressure regulator VPPM
The right parameters for every application by simply pressing a button – fast, universal and accurate.

Solenoid valve VOVG
The compact configured valve for individual solutions: small dimensions with high flow rates.

Vacuum and pressure valve combination MHA1
Especially close to the suction cup and thus ideal for assembly: the weight-optimised vacuum-pressure combination with high flow rate. Ready for installation on a sub-base.

Mechanically and manually actuated valves VMEM/VHEM
The all-rounders amongst the valves: the consistent range of directional control valves with high flow rates for manual and mechanical actuation of pneumatic drives for universal use.

Soft-start and quick exhaust valve MS6-SV

Highest degree of safety for people and machines with the MS6-SV soft-start and quick exhaust valve. It ensures quick and reliable exhausting in all safety-critical machine areas in case of a sudden emergency stop. It simultaneously creates the highest possible machine availability through safe and reliable processes.

Benefits

- Tested safety: trade association approval to DIN EN ISO 13849-1, category 4, performance level e
- Function integration: integrated on/off and soft-start functions
- Redundant system for “safe exhaust” function
- Self-testing
- Can be integrated into complete MS service unit combinations with filter and control functions

Safety for workers in hazard zones: If there’s a sudden emergency stop, the most important thing is to ensure the safety for people and machines. Dangers of injury and machine downtime have to be avoided.

Category 4 to ISO 13849-1, performance level “e”.

Safety for workers in hazard zones

MS6-LWS water separator

Maximised process reliability with 30 % more water separation as opposed to standard filters. Thanks to its extremely high degree of efficiency, the MS6-LWS pays for itself in many applications where water droplets in the compressed air system might impair process sequences in a lasting fashion. Its nearly complete condensate separation, based on the centrifugal method, provides effective protection against damage.

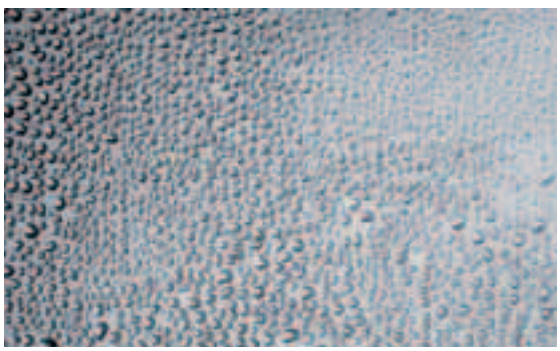
Benefits

- Protects continuous process sequences
- Maintenance-free centrifugal method without the need to replace filter cartridges
- Highly impact-resistant thanks to robust metal bowl
- Maximised flow rate with compact design
- Optimised air supply to the actuators

Technical data

- Grid dimension: 62 mm
- Permissible primary pressure: max. 16 bar
- Operating temperature: -10 to +60 °C
- Housing material: die-cast aluminium
- Connection sizes: G1/4, G3/8, G1/2

Note: Only suitable for separating water droplets. We recommend the membrane dryer LDM1 or the adsorption dryer PDAD for reducing humidity.



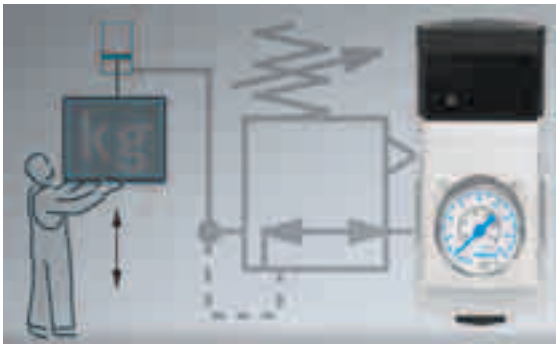
Nearly complete condensate separation protects against damage

Precision pressure regulator MS6-LRP-PO

Additional safety for many industries. The new precision pressure regulator MS6-LRP-PO for MS series service units facilitates controlled lifting of heavy loads. Its convenient, external pilot regulator control has proven especially beneficial in areas that are difficult to access. And it masters sensitive tasks, such as equalising various weights in balancer applications, with the help of optimised control characteristics.

Benefits
- Remote controlled pressure regulation with pneumatic pilot control
- Good control characteristics thanks to minimum hysteresis of 0.02 bar and primary pressure compensation
- User-friendly solutions as individual device, regulator combination or compact service unit combination
- Quick and easy installation with completely preassembled devices

Technical data
- Grid dimension: 62 mm
- Permissible primary pressure: max. 16 bar
- Operating temperature: -10 to +60 °C
- Connection sizes: G1/4, G3/8, G1/2
- Pilot air connection: G1/8



Ideal control characteristics for balancer applications

Vacuum generator OVEM

Condition monitoring with OVEM: increases process reliability and prevents machine downtime. OVEM monitors selected evacuation and ejection times for each cycle and provides automatic, prompt error messages. Vacuum pressure levels can be read from the LCD either numerically or as a bar graph and analysed during operation.

Benefits
- Quick, precise and reliable placement of the workpiece thanks to the ejector pulse
- Can be configured as desired with a wide selection of different functions
- Easy, clear operation: all controls on one side
- Space-optimised: all functions integrated into a single unit
- Nearly maintenance-free thanks to open silencer and filter with viewing window
- Extremely easy installation with M12 multi-pin plug

Technical data
- Laval nozzle nominal diameters: 0.45, 0.7, 0.95 or 1.4 mm
- Max. vacuum: 85 %
- Switching outputs: PNP, NPN

Analysis at a glance: condition monitoring with OVEM

Metal push-in fitting NPQM

Delivers on its promise for outstanding economy.
Designed as an inexpensive alternative to metal versions for a great variety of applications, the NPQM is above all suited for media such as compressed air and vacuum, whether in car body manufacturing, the electronics industry or workshop environments. Additional applications on request.

Benefits
- Pressure resistant to 15 bar
- Sturdy, full metal design
- Antistatic in combination with PUN-CM tubing
- Flame-retardant in combination with PUN-V0 tubing

Technical data
- Operating temperature: -20 to +70 °C
- Operating pressure: -0.95 to 15 bar
- Connections available in M5, M7, G1/8, G1/4, G3/8 and G1/2

Sturdy: ideal for use in the automotive industry

Polypropylene fitting NPQP

Developed for use wherever alternatives to stainless steel can be used. In combination with PLN tubing, polypropylene fittings are highly resistant to all common cleaning agents. Excellent corrosion protection promotes their use instead of costly stainless steel fittings.

Benefits
- Highly resistant to media: resistant to many chemicals and acids
- Resistant to hydrolysis
- Resistant to high temperatures
- Large range of variants
- Approved for clean rooms
- Suitable for media such as compressed air and vacuum and others on request (for example water)

Technical data
- Operating temperature: -20 to +80 °C
- Operating pressure: -0.95 to 10 bar
- Connections available in M5, R1/8, R1/4, R3/8 and R1/2

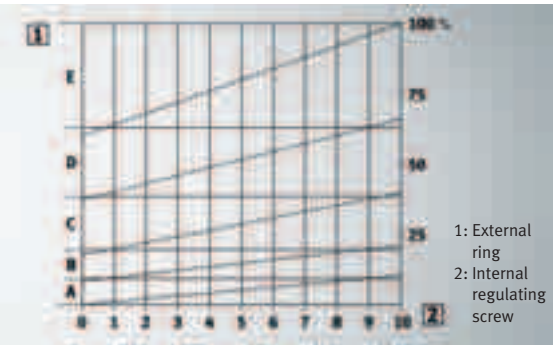
Ideal for use with aggressive media and chemicals

One-way flow control valve with fixed offset GRLSA

Digital and analogue functions combined in a single component. The time required for setting up machines and systems can now be significantly reduced. The GRLSA one-way flow control valve with fixed offset creates one common denominator for an ideal flow rate setting and desired reproducibility. Take advantage of increased availability, improved process and system reliability, and TPM (total productive manufacturing).

Benefits
- Reproducibility of selected values (5 steps, A through E) with clear-cut definition and documentation
- Simple, precise adjustment of cylinder speeds
- Requires less time for setting up machines and systems
- Sensitive adjusting screw with 10 additional positions for individual settings

Technical data
- Flow rate QnN (1/8-QS-6): 300 l/min
- Flow rate QnN (1/4-QS-8): 650 l/min
- Operating pressure: 0.2 to 10 bar
- Ambient temperature: -10 to 60 °C



Sensitivity and reproducibility – it's merely a question of adjustment

Tubing for customer-specific requirements

Tubing for customer-specific reuirements: optimum for series machines. Applicable from 3,000 m onwards: individualised tubing in terms of colour, bulk size and printing.

Benefits
- Individual batches: Starting at a minimum order quantity of 3,000 metres, we deliver in units of 25, 50, 100, 200–500 metres
- Individual design: your logo and/or part number printed on the tubing
- Easier to recognise and handle: individual colour selection
- Choose from 7 basic colours – other colours on request

Individualised printing

Product range expansions and add-ons
Compressed air preparation, vacuum and connection technology

MS6-LR-...KD with rotary knob turned 180°
Space-saving installation of the pressure regulator: with rotary knob underneath.

Pressure regulator/gauge with rotary knob MS6-LR-DM1/DM2
Space-saving: the pressure gauge is integrated into the rotary knob on the pressure regulator.

Integrated pressure sensor MS4/6-...-AD7...10
Space-saving design: the integrated pressure sensor function in the SDE5.

MS9 fine filter, micro filter and activated carbon filter
Up to 600 % higher flow rates: MS6 service units combined with filters in new MS9 size.

One-way flow control valve VFOC with push-in sleeve
Simple, accurate adjustment of piston speeds.

Suction cup insert OASI
Ensures gentle, safe transport of unstable, fragile and thin workpieces: thanks to the suction cup insert made of porous sintered material.

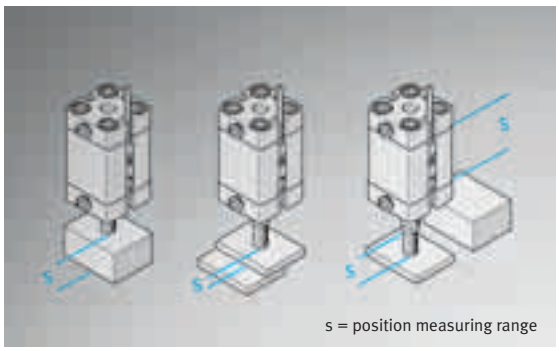
DPA pressure booster with air reservoir
Reliable pressure ratios always prevail: thanks to a combination consisting of stainless steel pressure booster and air reservoir. Including bypass with non-return valve for continuous system pressure in the air reservoir, pressure gauge set, silencer, fitting and quick coupling.

Position transmitter SMAT-8M

The SMAT-8M is the first position transmitter of its kind to be manufactured as a proximity sensor.
The sensing range is up to 40 mm, depending on the drive unit. It indicates piston motion via an analogue voltage signal. Ideally suited for press-fitting and clamping, location/position sensing, sorting of good and reject parts as well as workpiece replacement.

Benefits
- Direct connection to the controller via standardised, analogue interface
- Simple and secure mounting, similar to Festo proximity sensors
- Installation in the tightest of spaces thanks to its compact design
- No need for expensive special solutions via external potentiometers
- Integrated “out-of-range” detection
- Analogue measurement for cylinders with T-slot from Festo

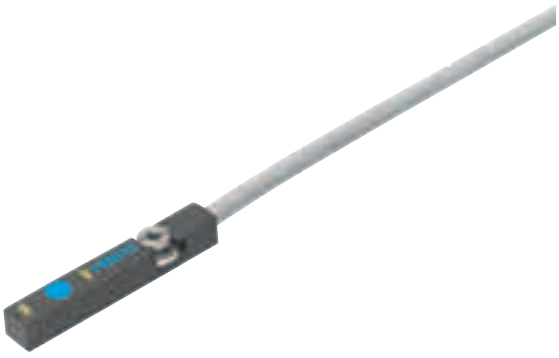
Technical data
- Reproducibility: typically ±0.1 mm, on grippers: ±0.025 mm
- Measuring range: up to 40 mm, depending on the drive
- Output: 0–10 V
- Connecting cable: 0.3 m long, 4-pin M8 plug
- IP65 and IP68 protection



s = position measuring range

Simple measurement of position in a defined area

Inductive proximity sensor SIES-8M



Unique: the first inductive proximity sensor for 8 mm T-slots from Festo. The SIES-8M provides reliable detection of intermediate and end positions. For example, in combination with the electric drive EGC or pneumatic grippers. Installation of the sensors in aluminium mounting profiles with T-slots opens up a wide range of possibilities. Together with the SIES-8M, the 8 mm slot profile offers a proven concept for fast and easy sensor mounting.

The status of the SIES-8M sensor is displayed by two LEDs on the left and right of the active surface; they’re highly visible at all times, no matter from which side the object approaches the sensor.

Benefits
- The only inductive sensor for 8 mm slots with patented status display by means of two yellow LEDs
- Time and space-saving installation concept
- Time-tested mounting technology similar to cylinder sensors
- Simple positioning and screw mounting thanks to new central mount

Technical data
- Connection system: rotatable M8 thread, open end
- Power supply: 10 to 30 V
- Switching distance: 1.5 mm, S_r per EN 60947
- Repetition accuracy ≤ ±0.05 mm (radial)

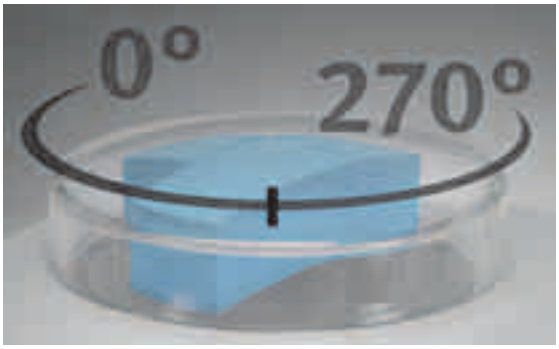
Highly visible thanks to 2 LEDs

Binary sensor box SRBP for quarter-turn actuators

Freedom of action as standard. The binary sensor boxes SRBP not only transform the actuator's or process valve's mechanical positions into electrical output signals, they also enable the optional detection of a mid-position.

Benefits

- Simple installation and commissioning: mounted directly on the quarter-turn actuator DFPB without the need for accessories and with self-adjusting end positions within a range of 0 to 270°
- Everything in view, even from a distance. The colour display indicates the current position of the actuator while the internal LEDs provide additional visualisation.
- Sturdy and explosion-proof: its corrosion-resistant, waterproof housing makes it suitable for harsh, corrosive environments, as well as potentially explosive atmospheres
- Know-how from Festo in the field of automation: from concept to solution, everything from a single source



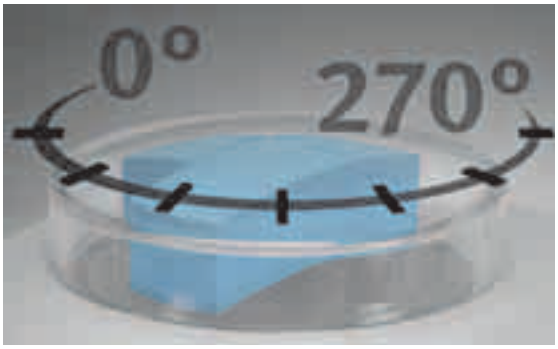
Including detection of one mid-position

Analogue sensor box SRAP for quarter-turn actuators

Complete, reliable, perfect fit. The analogue position indicator reads out a 4 to 20 mA output signal and is used to monitor the positions of quarter-turn actuators. Not just the end positions, but rather the entire swivel angle range is indicated by the analogue signal output.

Benefits

- Easy installation and commissioning: mounted directly on the quarter-turn actuator DFPB without the need for accessories and with teach-in function for adjusting the zero point and span within a range of 0 to 270°
- Everything in view, even from a distance. The colour display indicates the current position of the actuator
- Innovative, because intelligent: homing to the actual swivel angle makes optimum use of the entire output range
- Sturdy and explosion-proof: its corrosion-resistant, waterproof housing makes it suitable for harsh, corrosive environments, as well as potentially explosive atmospheres
- Know-how from Festo in the field of automation: from concept to solution, everything from a single source



Integrated displacement measurement thanks to analogue signal output

Pressure switch SDE5

Inexpensive alternative for uncomplicated, quick control. The intelligent miniature pressure switch indicates current pressure values in real-time. It's just as good at monitoring compressed air, regulators and vacuum as it is at detecting objects by means of back pressure – now with new features and measuring ranges.

Benefits
- Quick commissioning with teach-in function
- Inline pneumatic connection possible without T-fitting
- Extremely quick installation thanks to integrated QS connections, M8 plug connector or open-ended cable and linkable brackets
- Various operating modes: single switching point, mean value generation and window comparator
- Can be easily read thanks to a high contrast LED which runs all the way around the device

Technical data
- Pressure: 0 to 1 bar, -1 to 1 bar, 0 to 2 bar, 0 to 6 bar, 0 to 10 bar
- Relative and differential pressure
- Connection: QS4 on one or both sides, QS6 on one or both sides, QS5/32", QS1/4"
- Analogue output: 0 to 10 V
- Electrical outputs: 1 switching output, PNP or NPN

Quick and easy commissioning with teach-in function

Flow sensor SFAB

For absolute data on flow rates with threshold values and easy measurement of compressed air consumption: the unidirectional flow sensor SFAB. Intuitive switching point adjustment indicated at a display. Intelligent pressure measurement with freely programmable hysteresis/comparator mode for relative or differential pressure.

Benefits
- 5 different flow ranges can be selected
- Intuitive operation
- Highly flexible installation thanks to compact design
- Rotatable display with highly luminous LED for optimised visualisation
- Can be installed as desired without upstream and downstream smoothing sections thanks to integrated flow smoothing channel
- Quick installation thanks to integrated QS connectors and universal mountings

Technical data
- Measuring method: thermal process
- Installation position: any
- Freely selectable flow ranges: 10, 50, 200, 600 or 1,000 l/min.
- Operating pressure: 0 to 10 bar
- Response time: <100 ms
- Approvals: UL/CSA, C-Tick, Atex II 3 GD

Small and flexible thanks to compact design and rotatable display

Flow sensor SFAM-62

Intelligence in compact format: whether it's used as a stand-alone or combined with MS series service units, the high-flow SFAM can be ideally matched to your application. Not only does the clear-cut display offer a broad spectrum of flow information and threshold values, it also makes switching point adjustment extremely easy.

Benefits
- Broad spectrum of flow ranges for various applications
- More installation flexibility: compact design takes up significantly less space
- Simple and reliable due to minimal product complexity: no knowledge of actual flow rates is necessary thanks to the large measuring range
- Outstanding operating reliability: large, highly luminous LEDs enable easy reading of current flow rate values
- Compatible with MS6 service unit: can be used without any additional installation effort

Technical data
- Flow range: 10 to 1,000 Nl/min., 30 to 3,000 Nl/min. or 50 to 5,000 Nl/min., selectable
- Analogue output: 0 to 10 V or 4 to 20 mA, selectable
- Adjustable standard conditions: DIN 1343, ISO 2533, ISO 6358

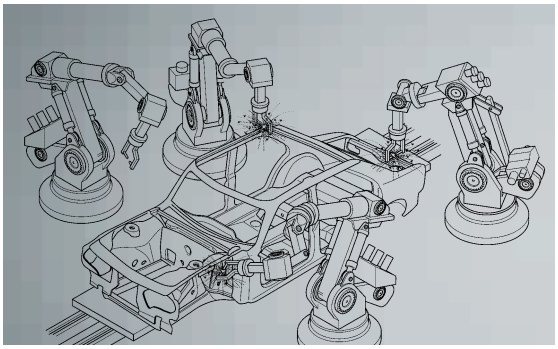
Inductive sensor SIEF-xxB for flush mounting

Now also available as flush mounting variant: SIEF-..B. Immune to interference caused by magnetic fields. Thanks to factor-1 technology, the SIEF-xxB spans switching distances which have been increased by up to 300 %. Its air-cored coil makes it up to 250 % faster than conventional proximity switches. Ideal for use in proximity to welding equipment.

Benefits
- Sensitive: extremely large switching distance for all metals
- Immune: unaffected by magnetic fields
- Flexible: large temperature range from -30 to +85 °C
- Dynamic: 250 % faster than conventional proximity switches
- Up-to-date: good electromagnetic characteristics in accordance with current standards

Technical data
- Operating voltage: 10 to 30 V DC
- Output current: up to 200 mA
- Switching frequency: up to 300 Hz
- Protection: IP67
- Mounting: flush or non-flush

Adapts itself to your application: stand-alone or integrated into the MS series



Robust and immune: ideal for use with welding equipment

Plug connectors NECU

One for all – for valves as well as sensors.
Quick plug connectors for fast, simple connection of open-ended cables.

Benefits
- Time saving thanks to simple mounting concept: insert, screw in – ready
- Fast, reliable cable-end finishing
- Available with M8 and M12 connections
- A single plug connector for all types of open-ended cables from Festo
- Complete assembly without tools

Finished in no time at all

Intelligent Compact Vision System SBOx-Q-R3x-WB

The designation SBOx-Q-R3x-WB stands for a cost-effective and flexible compact vision system. It's been developed as an ideal tool for 100 % quality inspection. Brilliantly simple where integration is concerned, it guarantees reliable test results – even with an enormous range of object types.

Applications overview
- Position detection and degree of rotation of parts
- Precision positioning of axes
- 2-D quality inspection
- Type identification

Benefits
- Integrated electronic evaluation unit
- Standardised software interfaces via Ethernet, as well as integrated 24 V I/O
- Sensor resolution: 752 x 480 pixels (monochrome and colour)
- Memory for 256 object types with 64 inspection characteristics each
- Highly sensitive to light
- Small dimensions and minimal weight

Communication via Ethernet

Radio gateway and radio I/O modules

For fast I/O data with WISA-COM. Establish high performance connections where cable can only be laid with great difficulty or not at all. The sturdy and very powerful radio transmission system makes it possible, even when confronted with other radio signals.

Benefits
- Fast, wireless data communication – only supply power is required
- Extremely simple installation and commissioning of the master transceiver
- Can be used in a great variety of applications thanks to various bus protocols
- Connection to control systems FED-CEC, CECX and CPX-CEC via CANopen
- Complete radio solution – everything from a single source

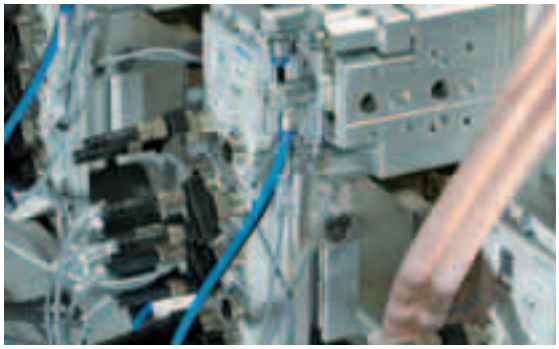
Technical data
- Radio transmission: WISA-COM/Bluetooth
- System response time: 15 ms
- Maximum number of users: 13 I/O stations
- Communication gateway: CANopen, Profibus DB, DeviceNet
- Range: 10 m radius

AS-interface gateway for CANopen and Profibus DP

Energy and data in a single cable! Modules in accordance with the new AS-i 3.0 standard function as gateways from CANopen or Profibus DP to the AS-interface. They integrate an extensive variety of slave modules and can be put into service quickly and easily.

Benefits
- Convenient installation of fieldbus devices
- Energy and data combined in just two conductors
- Easy integration of modules from various manufacturers
- Reliable AS-interface system can be fully implemented with Festo components

Technical data
- Interfaces: CANopen, Profibus, serial
- Operating temperature: 0 to 55 °C
- AS-interface master 3.0
- Protection: IP20



Radio fits where cables don't

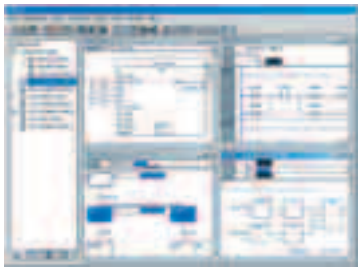
Integrated: energy and data in a single cable

Product range expansions and add-ons
Sensors, image processing and control technology

Compact pressure sensor SPAB
Surprisingly small format, convenient operation and an attractive price: three attributes that make the little SPAB a giant in its class.

Fork light barriers SOOF
Reliable detection made easy: the housing made of metal or reinforced polycarbonate means the ready-to install fork light barriers can be used in many industries. Integration of the transmitter and receiver into a single robust housing provides for easy installation and adjustment. The LEDs on the polycarbonate version are visible from all sides, thus ensure clarity at a single glance.

Software platform CoDeSys
Shorter time-to-market, delivered to your customer faster: The hardware-independent software platform CoDeSys accelerates your processes. With fast and easy configuration, programming and commissioning of pneumatic and electrical automation solutions.



Festo Energy Saving Services

Leaks are located by Festo's business partner LeekSeek while the machines are running.

Festo's Energy Saving Services help systems operators pinpoint and fully exploit potential savings where compressed air is concerned – and reduce your costs!

Benefits
- Energy efficient, environmentally-friendly systems operation
- Reduced operating costs
- Extended service life for components
- High system availability
- Reliable process sequences
- Use of up-to-date, energy saving technologies
- Compressed air supply dimensioned to meet actual needs
- Quick implementation and amortisation of energy saving measures
- Inspection of system status at regular intervals
- Continuous monitoring of critical machine processes

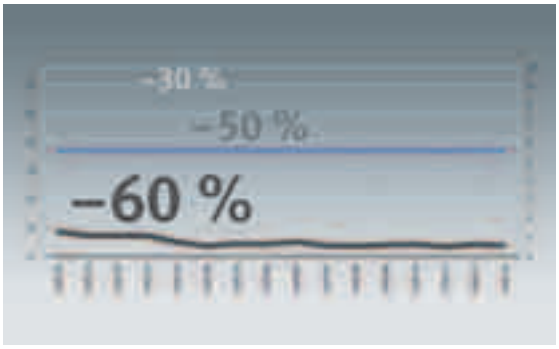
Festo Energy Saving Services

Analysis of the current situation
- Compressed air supply analysis
- Compressed air quality analysis
- Compressed air consumption measurement
- Pinpointing of leaks

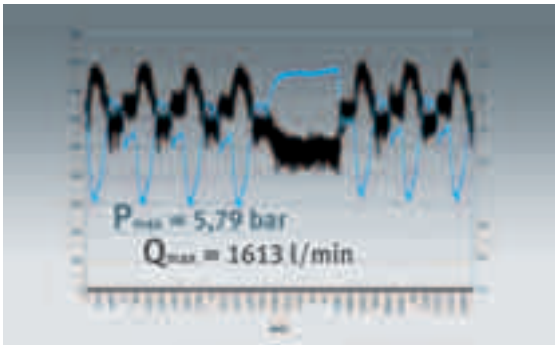
Planning preventive measures
- Developing a leak management concept
- Developing a modernisation concept
- Developing a condition monitoring concept

Implementation
- Carrying out of repairs
- Implementing the modernisation concept
- Implementing the condition monitoring concept

Maintenance
- 3-2-1 leakage pinpointing and compressed air quality analysis at regular intervals
- Execution of 3-2-1 preventive and corrective maintenance
- Training



Reduce compressed air consumption by up to 60 % with Festo's Energy Saving Services



Analysis of compressed air consumption for the optimum size of the compressed air supply

Electric Drives Seminar

www.festo-tac.com

Fundamentals of electric drive technology. Understanding, setting up and commissioning electric drives is the objective of this seminar for mechanical and electrical engineers. You'll become familiar with the functions of the individual components and you'll be able to operate various axes and replace individual parts.

Target group
Mechanical and electrical engineers

New, improved drive characteristics are achieved through the use of compact power electronics, innovative motor concepts, optimised mechanical components, new materials and high performance communication.

Participants will be provided with the basic knowledge necessary for quick and confident mastery of the new techniques offered during this seminar.

Advanced Seminar on the Machinery Directive

www.festo-tac.com

Safety for engineers in the fields of pneumatics and electro-pneumatics.
The European Machinery Directive is law. It assigns responsibility to the manufacturer for ensuring the safe design of machines and systems, which are confirmed by means of the CE mark. The previous DIN EN 954-1 standard regarding risk assessment has already been withdrawn and replaced with the new EN ISO 13849-1. Manufacturers are required to conduct risk assessments in accordance with the new standard.

Target group
Mechanical, electrical and control technology engineers

Specific pneumatic and electro-pneumatic circuits for "protective measures in safety-oriented pneumatics" will be explored at this seminar. These sample circuits will be considered with regard to their failure modes.

The objectives of this seminar are: laying out safety-oriented circuits up to control category 4, understanding the interaction between pneumatic and electrical components and assessing the performance of pneumatic cylinders. The seminar will also cover the factors which need to be taken into consideration while developing circuits of this type.

Process Automation Seminars

www.festo-tac.com

Understanding process automation – but how?
New seminars for design engineers, maintenance engineers, skilled workers and supervisory personnel. Specially tailored to actual knowledge requirements.

Target group
Design engineers, maintenance engineers, skilled workers, supervisory personnel

We'll provide you with further qualification, as well as answers to your current questions with an eye on the future – answers that bring you a decisive step further with your business plans.

VALVE PA 1
Valves in process automation – basics

VALVE PA 2
Valves in process automation – advanced

EX PA 1
Explosive safety – basics

EX PA 2
Explosive safety – advanced

SIL PA 1
Safety integrity level (SIL) per IEC 61508 – basics

SIL PA 2
Safety integrity level (SIL) per IEC 61508 – advanced

ISA PA 1
Symbols in PA, ISA-based (P&ID; PFD; BFD) – introduction

ISA PA 2
Symbols in PA, ISA-based (P&ID; PFD; BFD) – advanced

CONTROL PA 1
Optimising closed-loop control circuits

CONTROL PA 2
Closed-loop control circuits in practice

INST PA 1
Basics and operating principles of industrial measuring technology and instruments

INST PA 2
Operating principles of industrial measuring technology and instruments

PA-COMPACT
Modern process automation – executive summary

Everything from a single source: automation know-how for numerous industry sectors

Special know-how and an appropriate portfolio for factory automation are the results of many years of automation experience in nearly every conceivable industry.

Process automation à la carte: Festo pneumatics ensure reliable, precise and cost-effective processes in drinking water and sewage technology and in biotech/pharmaceutical and chemical industries.

A wide range of different industry sectors and areas of automation put their trust in the excellent products and services of Festo. The result is an exemplary partnership that includes higher productivity and increased process reliability.

Festo is partner to industry sectors, both in the area of factory automation – for handling of discrete goods – and in process automation, where processes involve gaseous, liquid and viscous fluids or bulk material. The reason: excellent knowledge of branch-specific requirements in production and production resources – and usually with a wide ranging portfolio that ideally meets these conditions.

Solutions for the factory automation


Machine tools


Conveyor technology


Special machine building


Automotive industry


Food and packaging industry

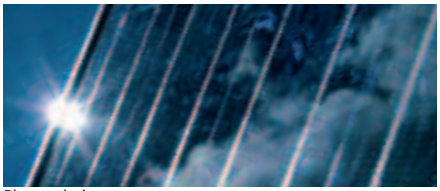

Woodworking and processing industry


Paper and printing machine manufacture


Handling and assembly technology


Textile industry


Electronics industry/light assembly

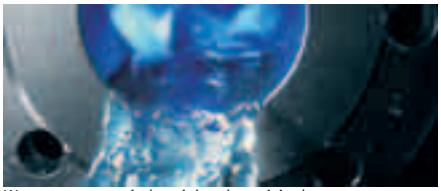

Photovoltaics


Aluminium industry

Solutions for the process automation

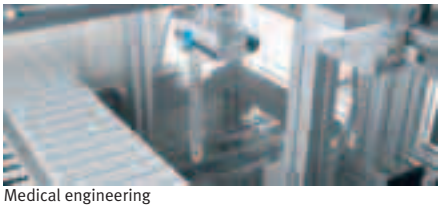

Process industry


Biotech/pharmaceutical industry


Water treatment, industrial and municipal


Chemical industry


Mining


Medical engineering

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www.festo.com/productextensions

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