

# Actuator solutions for controlling dampers

**FESTO**



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

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



Our actuator solutions for controlling dampers for all industrial sectors in which processes are operated with gas, oil, coal or biomass, and the air supply must be extremely precisely and reliably controlled.

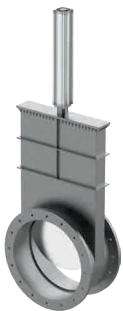
The ready-to-install actuator units save time and money, from the engineering to the assembly stage. They can be optionally used with a customised control cabinet that covers all relevant safety functions.

#### **The benefits at a glance**

- + Maximum process reliability
- + Fast positioning
- + Temperature and corrosion resistant
- + Optionally with safety functions
- + Certification in accordance with ATEX and SIL possible
- + Supplied ready to install
- + Including CAD data

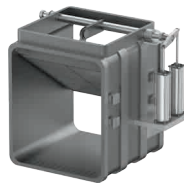
## We have the right solutions for your applications

Damper control systems for shutting off gases are becoming increasingly important to control critical processes and to ensure occupational safety and protect employees. Automation is the key to your success and places very high demands on the components. Festo supports you from project engineering to automating process valves. Whether you require a guillotine damper, diverter damper, butterfly damper, louvre damper or a poppet damper, thanks to our pneumatic solutions for damper control systems, you can continuously and precisely control the air flow and fill level in your processes.



### Guillotine damper

- Simple “open/closed” function
- For high temperatures, pressure and abrasive gases
- Ideal for controlling, redirecting or closing gas flows that contain a lot of dust
- Linear closed-loop control



### Diverter damper

- Controlling the flow of media or isolating a channel at the same time
- 3-way damper with one inlet and two outlets
- The gas switch controls both outlets via a flap
- Linear or rotary closed-loop control

Precisely controlled

Your process valve



### Butterfly damper

- Simple control tasks or “open/closed” function
- Controlling or isolating gases
- Single-leaf or multi-leaf damper
- Rotary closed-loop control



### Poppet damper

- Simple “open/closed” function
- Economical solution for a single gas stream
- With a shaft and multi-layer disc assembly
- Compact design ensures fast cycles to isolate the inlets and outlets
- Linear closed-loop control



### Louvre damper

- Controlling or isolating gases
- Parallel or opposing movement of the flaps
- The individual slats are controlled by a central shaft
- Linear or rotary closed-loop control



# Linear actuator with external displacement encoder – tried and trusted, and reliable

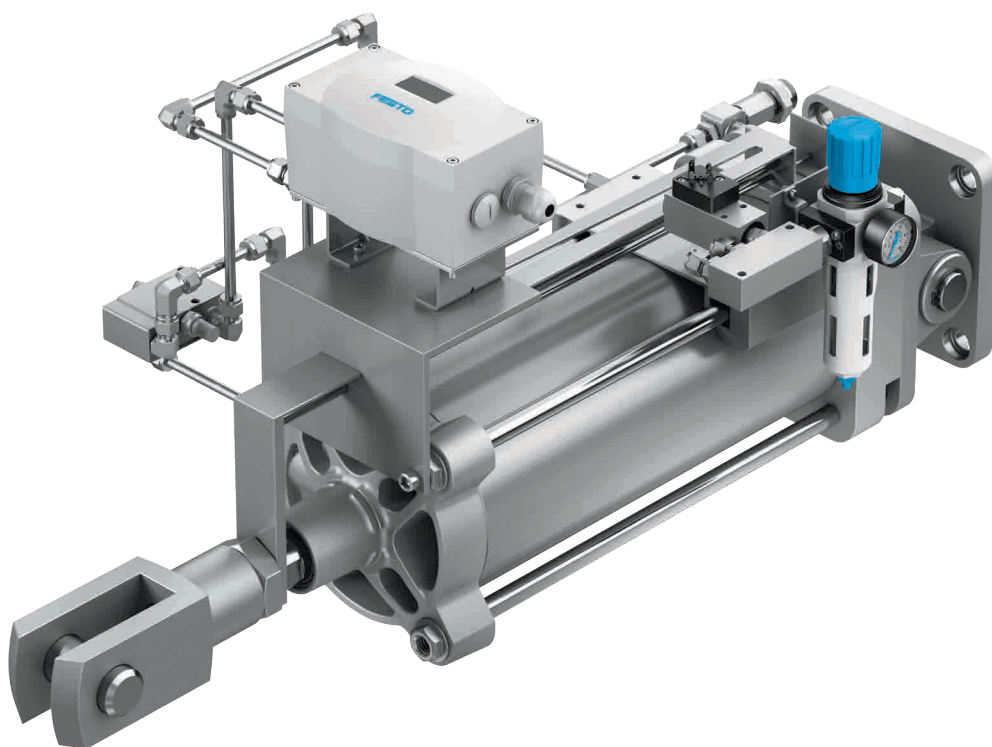
Do you want to control your air supply process fully automatically? The linear actuators of the DSBx series with external attachments offer you ready-to-install complete solutions that have proven their worth for decades. They are assembled and arranged entirely according to your requirements.

The linear actuator with external displacement encoder and positioner is a well-engineered, tried and tested and reliable solution for controlling dampers. Festo takes over the engineering for you and provides you with the fully assembled and tested sys-

tem according to your requirements. With freely selectable and perfectly coordinated components, also in special versions for high and low temperatures. You will receive ready-made CAD data and, if required, certification to ATEX or SIL.

## Unique to both systems: the sealing technology

The lip sealing technology from Festo guarantees the dynamic sealing of the actuators from the DSBx and the DFPI series – with minimal friction and maximum efficiency.



### Cylinder DSBG/DSBC

- Tried and trusted series in accordance with ISO 15552
- Widely configurable
- Self-adjusting pneumatic cushioning (PPS)

### Displacement encoder MLO

- Suitable for DSBx series
- Transmits the actual position of the actuator to the positioner

### Positioner CMSX

- Continuous comparisons of all setpoint and actual positions of the actuator
- With any deviations: automatic error message and movement to defined safety position

### Accessories

- In accordance with ISO 15552: swivel flange and rod clevis
- Customised flange, filter controllers, limit switches, push-in fittings, compressed air reservoirs, stainless steel piping

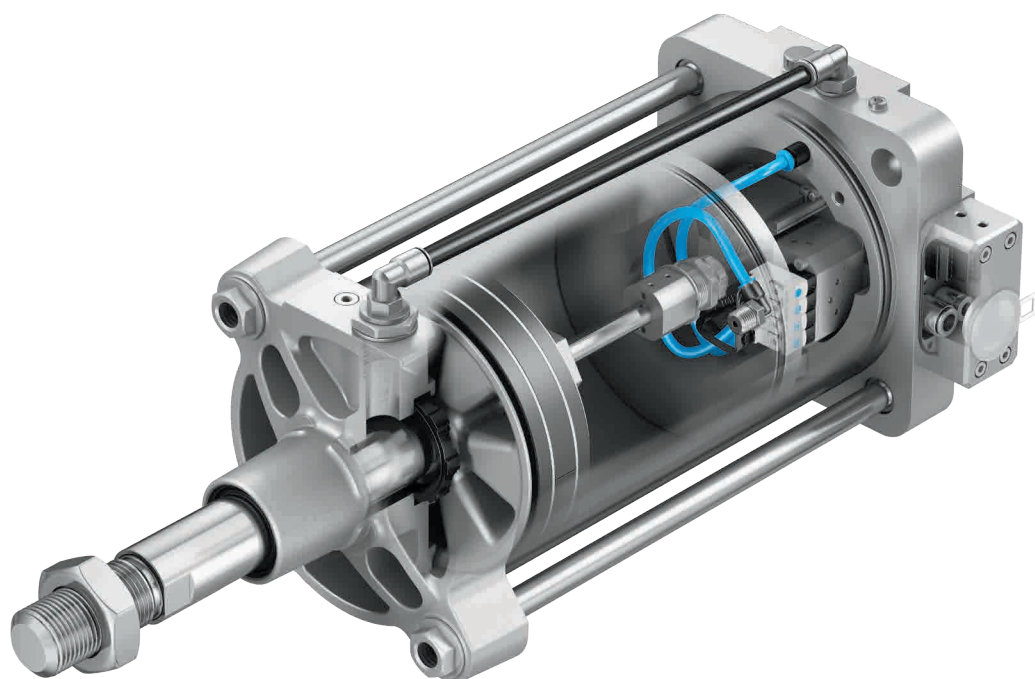
# Linear actuator with integrated displacement encoder – for maximum precision and efficiency

Save yourself the hassle of downtimes and intensive maintenance. Get the most out of your process with the integrated solutions of the innovative DFPI series. Depending on the design, the positioner, as well as the displacement encoder, is integrated.

Increase your process reliability and reduce the maintenance frequency for the actuators with the integrated displacement encoder in our linear actuator DFPI-...-E-NB3. The DFPI-...-C1V-NB3... goes one step further. This complete solution also

includes an integrated positioner in the actuator housing. This makes it possible to control the position without additional add-on components. At the same time, this fully integrated solution is protected from all adverse external influences

(such as dirt), reducing wear and tear. Even accumulated tolerances are eliminated. This increases your system availability and reduces costs.



## Displacement encoder

- Integrated with actuator DFPI-...-E-NB3
- Potentiometric
- Provides an analogue voltage signal for external positioners

## Positioner

- Fully integrated with DFPI-...-C1V-NB3...
- A factory-set safety position in case the operating voltage or analogue setpoint fails
- Position specification and feedback is provided by an analogue setpoint signal

## Connectivity options

- Variants for connecting the pneumatic and electrical connecting cables
- Protection possible up to IP69K
- Connection socket
- M12 plug
- Cable connector

## Accessories

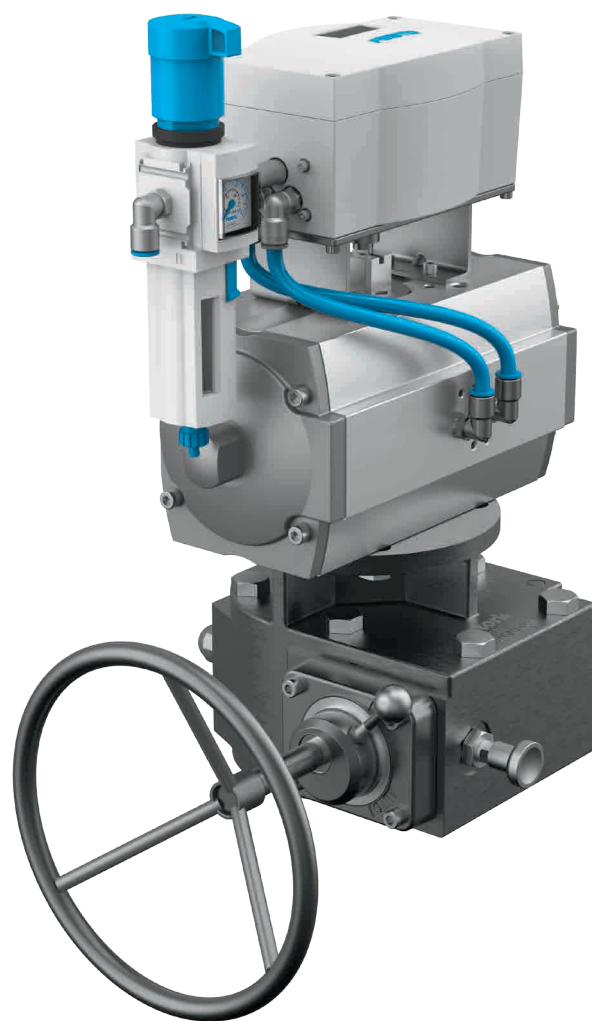
- To ISO 15552: piston rod attachments, swivel flange, flange and foot mountings, compensating elements, rod eyes and rod clevises, retaining brackets for proximity sensors
- Also available in corrosion-resistant versions
- Specific: pre-assembled connecting cable NHSB

# Quarter turn actuator for rotary motion – compact, modular, precise

Do you prefer an actuator with rotary motion without additional lever action? The quarter turn actuator DFPD allows the force to be transferred directly to the shaft – for fewer tolerances and greater process reliability.

The compactness and modularity of the quarter turn actuator DFPD is truly impressive. It is attached directly to the process valve. The single-acting version of the actuator has a safety function that is easy to implement and the optimised layout of the springs requires only marginally more space. The position of the process valve can be controlled

continuously with a mounted positioner such as the CMSX. The digital sensor boxes SRBC/SRBE/SRBG can be used for end-position sensing, or the analogue sensor box SRAP can be used for path monitoring.



## Quarter turn actuator DFPD

- Single-acting or double-acting
- End positions adjustable at both ends
- Suitable for extreme temperatures
- Mounting plate in G threads and NPT threads

## Positioner CMSX

- Continuous comparisons of all setpoint and actual positions of the actuator
- Automatic error message and movement into defined safety position in case of any deviations

### Alternative to the positioner: sensor box SRBE/SRBC/SRBG/SRAP

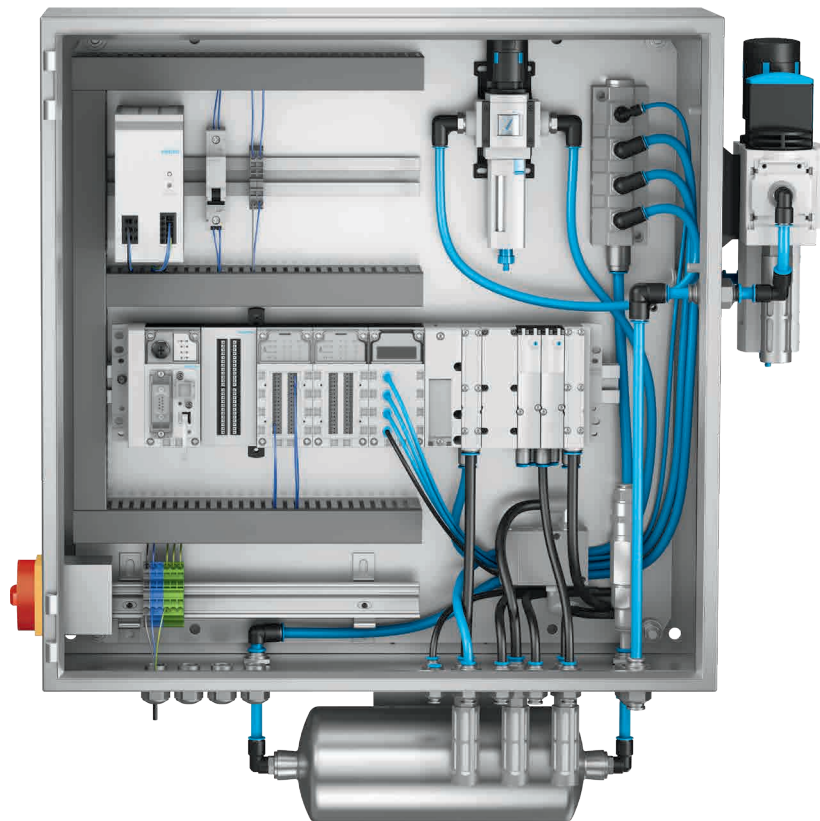
- Weatherproof housing
- Many switch variants
- Intrinsically safe to ATEX
- For SRBE/SRBC: two cable inputs for common power supply for the sensor box and the solenoid valve

## Accessories

- Gearbox with handwheel push-in fittings
- Tubing
- Compressed air reservoir
- Filter controller of MS series with 5 µm filter for positioner

## A complete solution with control cabinet – for maximum safety

You can round off your chosen actuator solution with a customised control cabinet. All signals, from the process valve to the process parameters, flow via the CPX/MPA and are communicated to the control system via a bus connection.



### **Safety functions included**

Your customised control cabinet contains all the relevant safety functions, such as the fail-safe function to move the actuator unit manually or automatically to a freely selectable safety position (i.e. “retracted”, “extended” or “freeze position”) in the event of a power or pressure drop.

### **Optional seal air system**

If required, a media-sealed barrier in the duct can be realised for the dampers by using a seal air system. In such a system, air is introduced between the two vanes with a suitable pressure that is slightly higher than the pressure of the medium in the duct. This creates a so-called “air barrier” that ensures the system is completely sealed when the damper is closed. This guarantees a complete separation of the medium in the duct. Festo offers you individually designed, fully-automated solutions that meet your safety requirements.

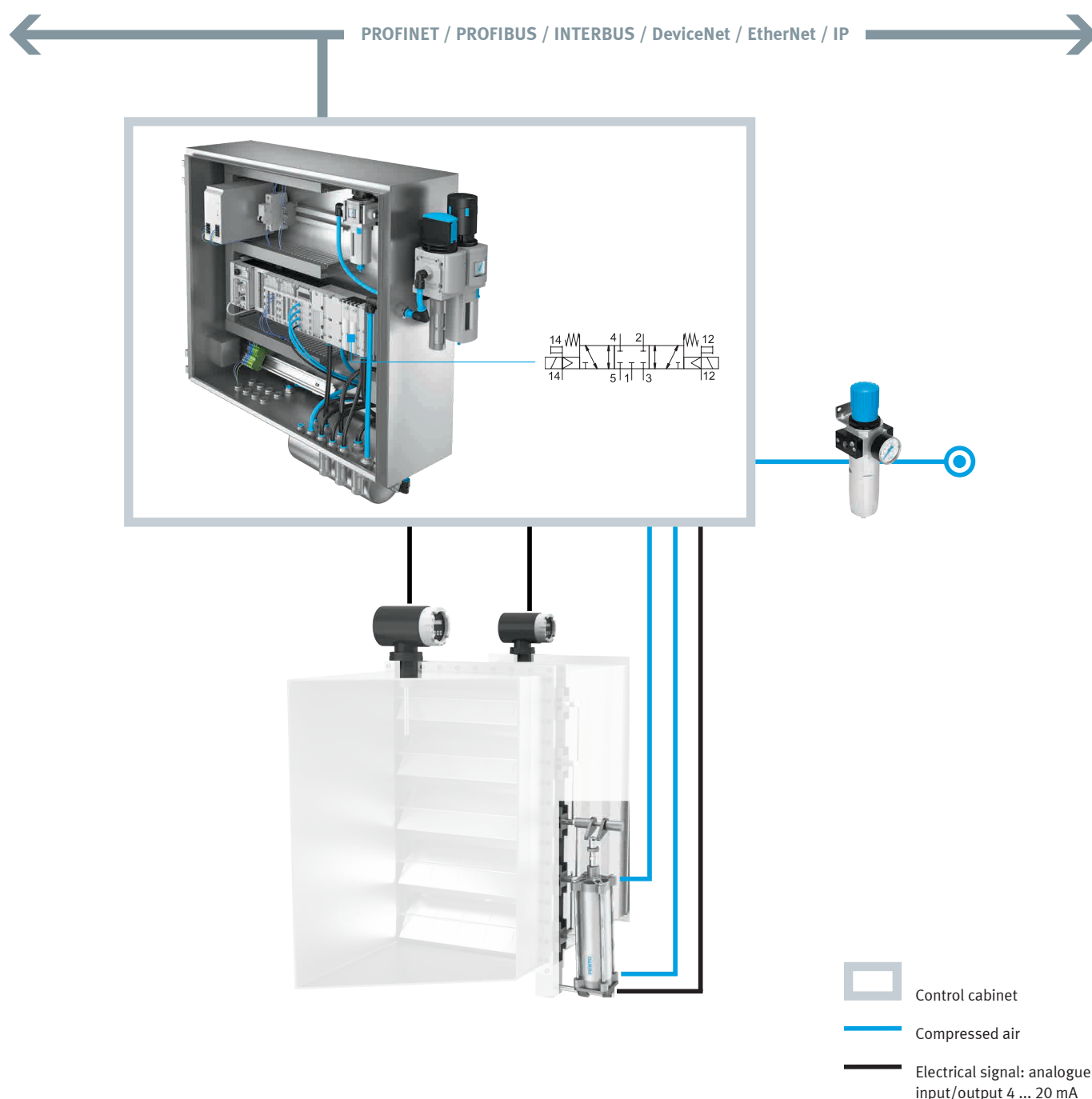
### **Visualisation directly in the field**

The user interface programming and parameter display are carried out in line with your specifications. A digital twin of the actuator visualises the current position and displays the actual values. By programming an individual software component, the process valve can also be controlled decentrally.

## Positioning without a positioner – simple and efficient

Do you use a positioner for your control processes? It's now even easier: via a 5/3-way valve (APB = All Ports Blocked). With a valve slice on the CPX/MPA and the relevant software module in your controller, positioning can now be done directly via the valve terminal.

A hot-swap plate allows you to change the valve slice on the valve terminal MPA, if necessary even during operation, without having to recalibrate. There are suitable valve slices for high flow rates, which also increase the actuating speed of the process valve. Festo offers you a complete solution, from actuator to controller, all specially tailored to your needs.





# Ready-to-install solutions – the benefits for you at a glance

## Operate

The benefit to you:

- Complete documentation, quickly integrated into overall documentation

Our service:

- Detailed system documentation in the end customers' national language
  - Assembly drawing
  - Parts list
  - Circuit diagrams
  - Operating instructions for components

## Assemble

The benefit to you:

- Reduced manufacturing involvement as no in-house machining or pre-assembly is required
- Maximum reliability with regard to function and quality
- Expertise on standards and directives included

Our service:

- Application-specific machining
- Assembly of all individual components
- Installation of third-party components possible
- Complete tubing and wiring
- Full functional and leak testing
- Test certificate
- Certifications, e.g. EN60204-1, ATEX, UL-508A

## Modernise

The benefit to you:

- State-of-the-art technology
  - Easy to service and clear layout
  - Energy efficiency as standard
- Our service:
- Compressed air cost calculator
  - Energy Saving Services

## Make contact

The benefit to you:

- Systematic support right from the start
  - Expert know-how included
- Our service:
- Personal advice in 59 countries
  - Pneumatic, servo-pneumatic, electric and mechatronic technologies
  - Application- and industry-specific

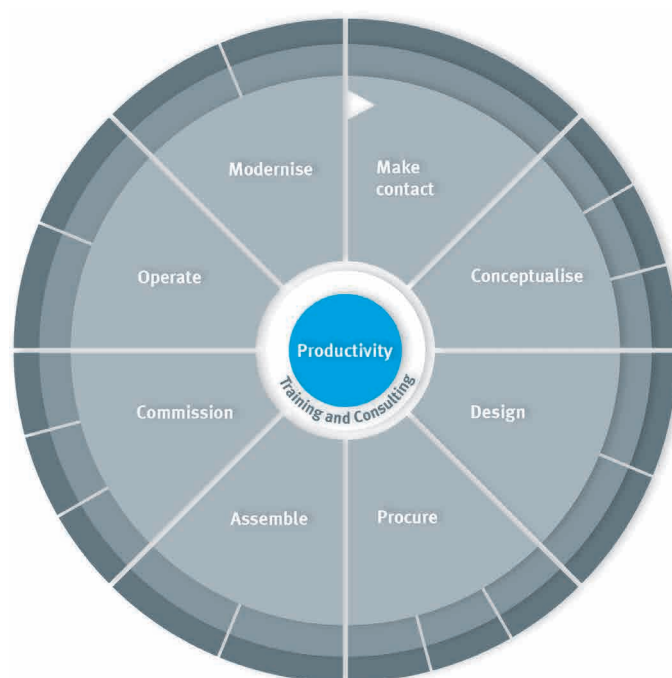
## Conceptualise

The benefit to you:

- Consideration of application-specific requirements
- Detailed quotation with engineering concept
- Specific automation expertise for different industry segments

Our service:

- Quotation includes
  - 2D/3D concept
  - Detailed parts list
  - Functional sequence



## Design

The benefit to you:

- No engineering effort required
- Individually tailored solutions based on application-specific requirements
- Solution based on the latest technological standards

Our service:

- Full engineering
  - Technology and component selection
  - Sizing of solutions
  - CAD design (2D/3D)
  - Circuit diagram creation
  - Simulation
  - Programming

## Commission

The benefit to you:

- Minimal assembly and installation effort with Festo plug and work
  - Straightforward assembly principles
  - Defined interfaces
  - Teach-in or parameterisation functions

Our service:

- Commissioning service

## Procure

The benefit to you:

- Reduced costs thanks to single sourcing
  - Easy order processing and minimal logistical effort with just one order item for the entire solution
  - One delivery date
- Our service:
- Procurement of all components and foreign parts
  - Delivery of a ready-to-install system

# System components in detail

## Linear actuators



### DSBG/DSBC

- Piston Ø: 32 mm ... 320 mm
- Stroke: 1 ... 2800 mm
- Standards-based cylinders to ISO 15552 for flexible installation
- For use up to 150°C
- Increased corrosion protection
- ATEX variants up to 2 GD



### DFPI-...-NB3

- Piston Ø: 100 mm ... 320 mm
- Stroke: 40 ... 990 mm
- Integrated positioner or integrated displacement encoder for external positioner
- ISO 15552 for flexible installation
- Swivel motion possible for expanded areas of application
- IP65, IP67, IP69K

## Positioners



### CMSX

- Setpoint value: configurable (0 ... 10 V, 0 ... 20 mA, 4 ... 20 mA)
- Position signal: 4 ... 20 mA
- Voltage range: 21,6 ... 26,4 V DC
- Temperature range -5 ... 60°C
- Flow rate: 50 l/min ... 130 l/min
- Pneumatic connection: G1/8

## Displacement encoders



### MLO

- Connecting rod potentiometer
- Degree of protection IP65
- Stroke length 100 ... 750 mm
- Analogue measuring principle
- Absolute measurement with a high resolution of 0.01 mm
- Long service life

## Quarter turn actuators



### DFPD

- Size: 10 ... 2300 Nm
- Swivel angle: 90° or 180°
- Pneumatic connection: G1/8, 1/8 NPT, G1/4, 1/4 NPT or VDI/VDE 3845 (NAMUR)
- Standard process valve connection: ISO 5211
- Design: rack/pinion
- SIL 2 in accordance with IEC 61508: high demand mode
- For temperatures: -50 to +150 °C

## Solenoid valves



### VSNC

- NAMUR-valve
- Changeable seal for 3/2- or 5/2-way function
- Pneumatic connection: G1/4, 1/4 NPT or VDI/VDE 3845 (NAMUR)
- Operating pressure: 2.5 ... 10 bar
- For temperatures: -20 ... +60 °C
- ATEX variants up to 2 GD



### VOFC/VOFD

- 3/2-way valve or 5/2-way valve
- Pneumatic connection: G1/4, 1/4 NPT or NAMUR
- Operating pressure: 2.5 ... 8 bar or 0 ... 10 bar
- For temperatures: -25 ... +60 °C or -50 ... +60 °C
- SIL 2 in accordance with IEC 61508: low demand mode
- Ematal coating for maximum corrosion protection





## Valve terminals







### CPX/MPA

- Light and corrosion resistant
- Serial internal communication and linking of fieldbus connections with up to 16 sub-bases (128 valves, up to 512 I/O)
- Bus communication via Profibus DP, ProfiNet, CANopen, Ethernet IP and more
- Digital and analogue input/output
- CPX remote I/O: extra sturdy in metal design with modular linking
- Three valve sizes used in combination for a flow rate of up to 850 l/min, optionally in polymer or metal
- Any compressed air supply and any pressure zones are possible





## Sensor boxes

			
<b>SRBC</b>	<b>SRBE</b>	<b>SRBG</b>	<b>SRAP</b>
<ul style="list-style-type: none"> <li>• Measuring range 0 ... 90°</li> <li>• Operating voltage: 24 V DC, 110 V AC, 230 V AC, 8.2 V DC NAMUR</li> <li>• Sensor: inductive proximity switch, reed contact, changeover contact</li> <li>• Electrical output: NPN, PNP, N/C contact, N/O contact, changeover contact</li> <li>• SIL 2 in accordance with IEC 61508</li> <li>• ATEX variants up to 1 GD</li> <li>• Protection principle: Ex ia</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring range 0 ... 90°</li> <li>• Operating voltage: 24 V DC, 110 V AC, 230 V AC, 8.2 V DC NAMUR</li> <li>• Sensor: inductive proximity switch, reed contact, changeover contact</li> <li>• Electrical output: NPN, PNP, N/C contact, N/O contact, changeover contact</li> <li>• SIL 2 in accordance with IEC 61508</li> <li>• ATEX variants up to 1 GD</li> <li>• Protection principle: Ex d</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring range 0 ... 90°</li> <li>• Operating voltage: 24 V DC, 8.2 V DC NAMUR</li> <li>• Sensor: inductive proximity switch</li> <li>• M12 plug connector or terminal rail connection</li> <li>• Switching output: PNP, NAMUR, 2-wire DC, AS-Interface</li> <li>• ATEX variants up to 1 G</li> </ul>	<ul style="list-style-type: none"> <li>• Measuring range 0 ... 270°</li> <li>• Operating voltage: 24 V DC</li> <li>• Sensor: magnetic Hall</li> <li>• Electrical output: analogue 4 ... 20 mA</li> <li>• ATEX variants up to 3 GD</li> <li>• Electrical connection: 9-pin/screw terminal/plug-in</li> </ul>

## Accessories to ISO 15552

			
<b>Rod clevises</b>	<b>Swivel flange</b>	<b>MS series</b>	<b>NHSB</b>
<ul style="list-style-type: none"> <li>• Rod clevises from M4 ... M48x 2 female thread</li> <li>• Rod clevises with increased corrosion protection</li> <li>• Self-aligning rod coupler from M4 ... M48x 2 male thread and M4 ... M16 female thread</li> </ul>	<ul style="list-style-type: none"> <li>• Swivel flange for linear actuators with piston Ø 32 mm to 320 mm</li> <li>• Swivel flange with pivot pin and protection against rotation</li> <li>• Suitable clevis foot available</li> </ul>	<ul style="list-style-type: none"> <li>• High flow rates</li> <li>• Customised configuration</li> <li>• Integrated sensors</li> <li>• Safety functions</li> <li>• Supports greater energy efficiency</li> <li>• UL and ATEX category 2 GD</li> </ul>	<ul style="list-style-type: none"> <li>• Pre-assembled electrical and pneumatic connecting cable for linear actuator DFPI <ul style="list-style-type: none"> <li>– 3-core, for DFPI without integrated positioner</li> <li>– 5-core, for DFPI with integrated positioner</li> </ul> </li> <li>• Available in lengths of 0.6   5   10   15 metres</li> </ul>

## Other accessories

			
<b>Air reservoir</b>	<b>Limit switch</b>	<b>Fittings and tubing</b>	<b>Stainless steel piping</b>
<ul style="list-style-type: none"> <li>• Operating pressure: -0.95 ... 16 bar</li> <li>• Volume: 0.1 ... 20 l</li> <li>• Material: high-alloy stainless steel</li> <li>• Corresponds to an OD of 2000</li> </ul>	<ul style="list-style-type: none"> <li>• Pneumatic or electric limit switch</li> <li>• With roller lever, plunger or contactless via inductance</li> </ul>	<ul style="list-style-type: none"> <li>• Tubing for a wide variety of working environments: also available in food-safe, flame-retardant, PWIS-free or media-resistant design</li> <li>• Fittings and cable connection components with plug-in connections or male coupling connections for the tubing</li> <li>• Typical push-in fittings and push-in connectors are: straight, L, T, X and Y</li> </ul>	<ul style="list-style-type: none"> <li>• Stainless steel piping on request</li> <li>• Ergonomics of the piping optimally adapted to the customised solution</li> <li>• Maximum corrosion resistance for harsh ambient conditions</li> </ul>



# Productivity

## **Maximum productivity is a question of ambition**

Do you share this attitude? We will be glad to help you achieve this goal – through our four outstanding qualities:

• Security • Efficiency • Simplicity • Competency

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