Sensors

FESTO

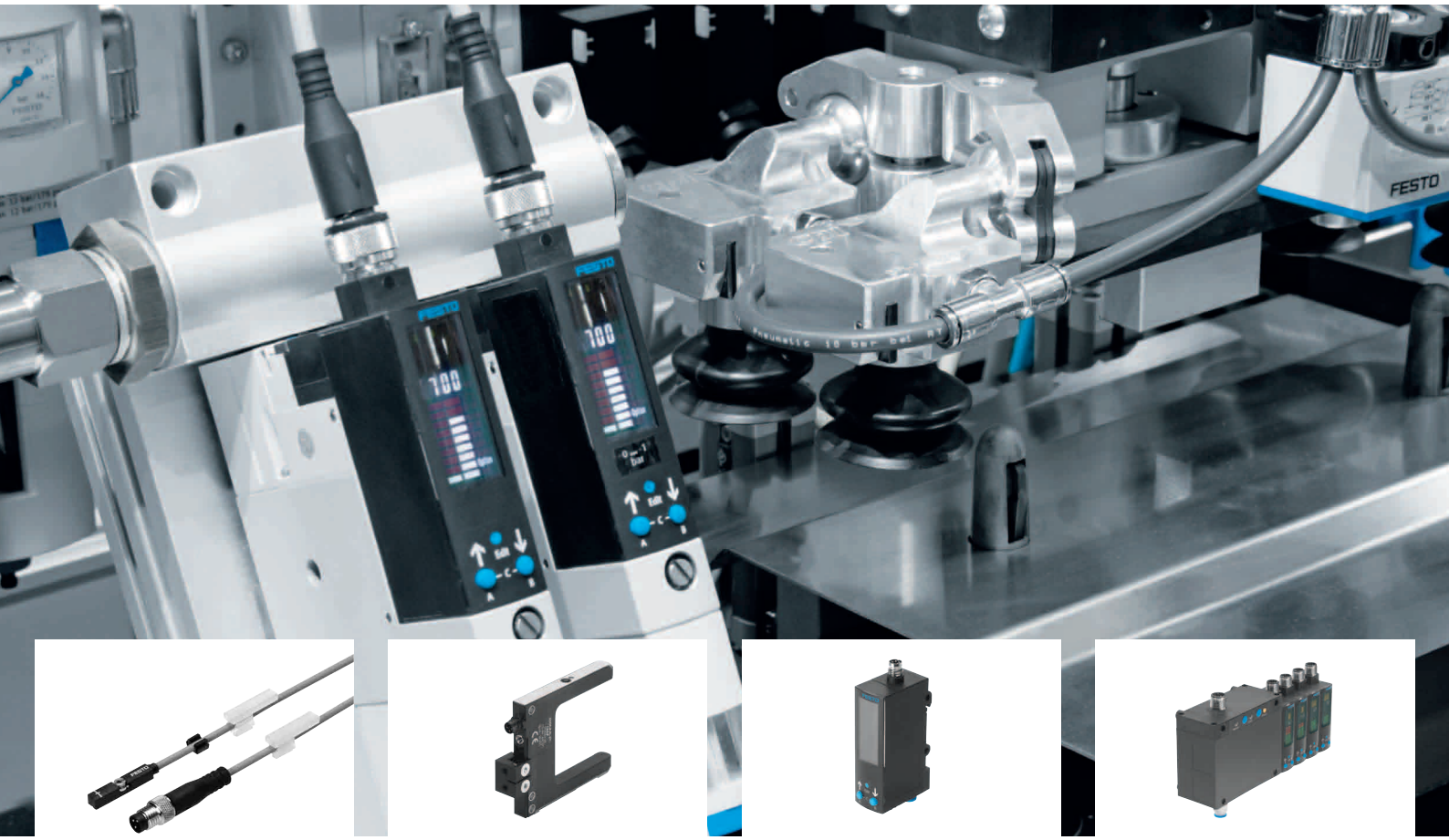


Table of contents

Advantages at a glance

- Complete range from the specialists in pneumatics-related sensor technology
- System competence from a single source
- Industry solutions
- Maximised process reliability
- Reduced downtimes
- System management for reduced costs

Sensor technology – the modular system for successful automation from a single source

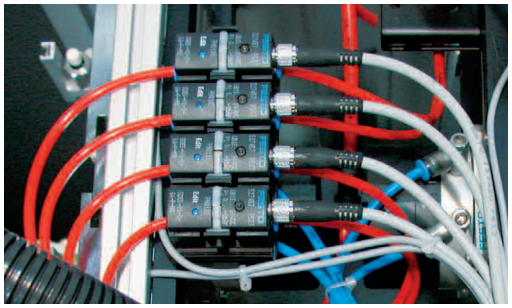
Faster cycle times, better process control, maximised process reliability and reduced downtimes. Nowadays the optimal use of resources by system and machine management is a critical factor for the economic success of any company.

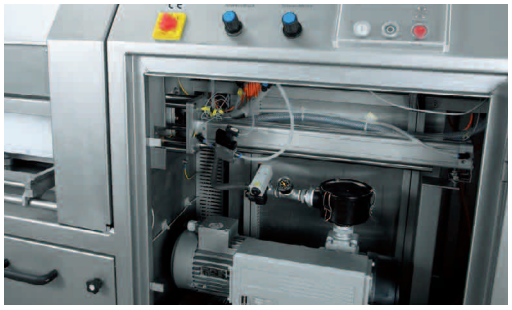
This is also the case for sensor technology, which plays an important part in the world of automation. Festo realised this more than 40 years ago and has consistently expanded its sensor range to further enhance both efficiency and profitability in automation.

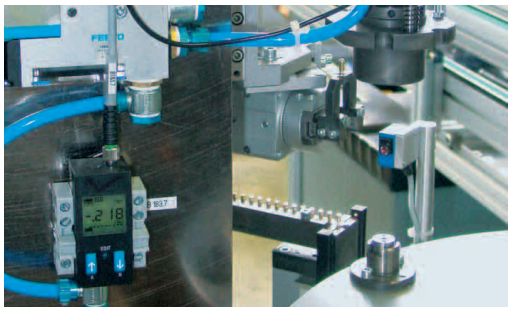
The current sensor range offers the right sensor for every task, be it pinpoint diagnostics, preventive condition monitoring or industry-specific tasks, for example in process automation or the automotive industry. With this range, Festo ensures perfect solutions for the entire automation chain – thanks to system competence from a single source.

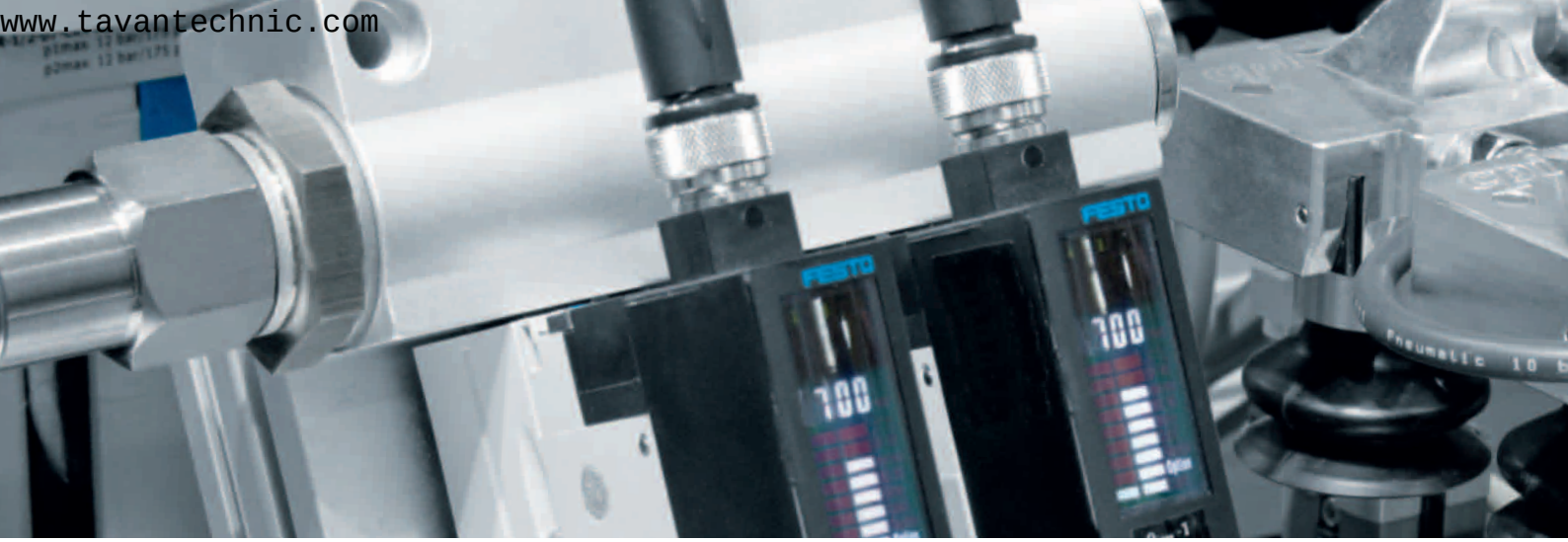
Products and services – long-term success assured
The know-how of successful customers, the automation competence of a strong partner with an in-depth understanding of production and process sequences and a meaningful integration of value added chains: this is a combination that yields success.

In focus – with sensors from Festo
Highest process safety, optimal performance and maximum reliability: the new and comprehensive portfolio of sensors combines these essential core factors, thus ensuring smooth and efficient production sequences. Many sensors represent the ultimate in technologically feasible and practical solutions and are surprisingly cost-effective. The portfolio ranges from position transmitter SMAT through precise and reliable contact monitoring with SOPA up to high-speed cameras for diagnostics and function monitoring, thus offering sensor technology for all applications.



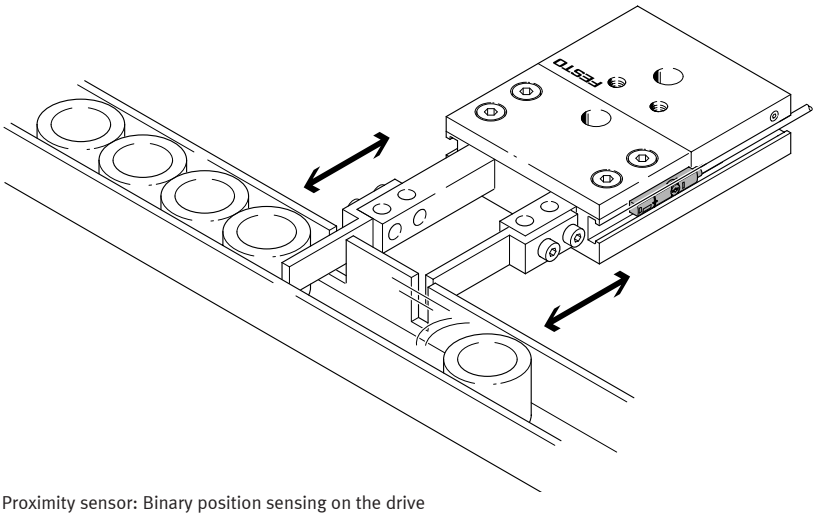




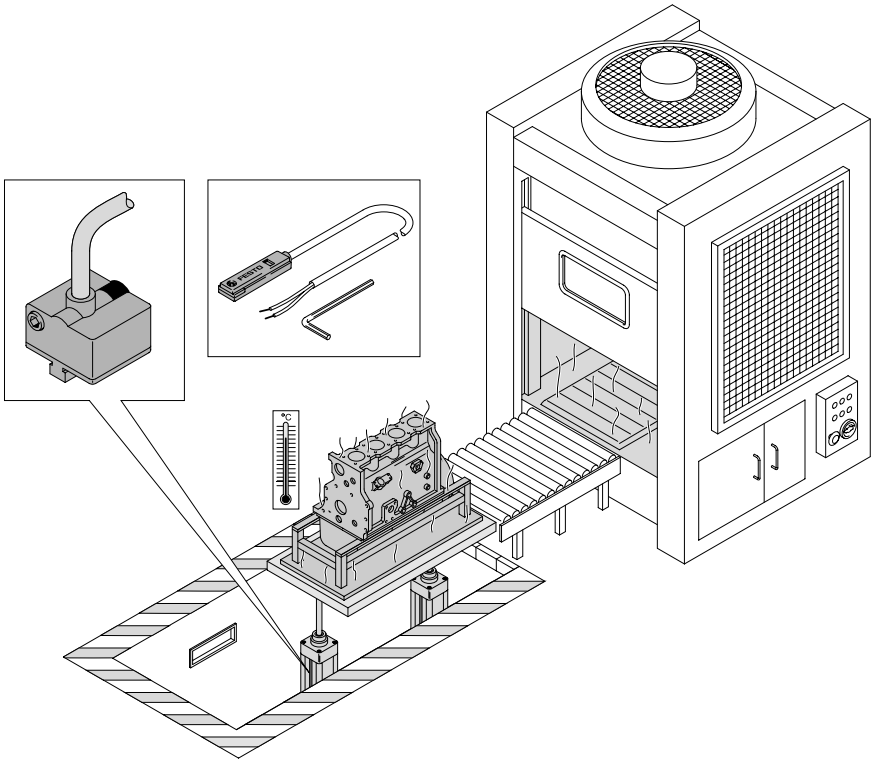


Proximity sensors

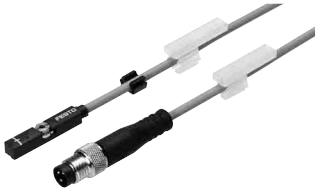
Proximity sensors for pneumatic drives form the starting point for Festo's sensor range – with good cause. These sensors are optimally matched and form a stable and successful platform for new variants and completely new functionalities.



Proximity sensor: Binary position sensing on the drive



Proximity sensor for very high temperatures



Fits all cylinders with T-slot:
Proximity sensor
SMT-/SME-8M
One for all: universally and mechanically harmonised sensor for all Festo drive units. Its secure fitting in the slot makes it very efficient. Vibration, shock and tensile forces applied to the cable will neither cause the sensor to become loose nor lead to unreliable sensor functioning.

- Contactless or contacting sensing
- Operating voltage up to 30 V AC/DC
- Electrical connection: M8, M12, open end

Proximity sensor
SMT-/SME-10M
Reliable sensing solution for drive technology with C-slot.

- Switching outputs: PNP, NPN, contacting
- Switching element function: N/O contact
- Electrical connection: M8, M12, open end
- Operating voltage up to 30 V AC/DC

For mini and precision grippers:
Proximity sensors SMH
Proximity sensors SMH are position sensors which have been specially developed for use with Festo mini and precision grippers. Depending on the grip arm position, an analogue electrical signal is produced in the proximity sensor. The conversion into 3 digital output signals = 3 gripper jaw positions takes place via evaluation units SVE4 or SMH-AE which are to be attached.

Proximity sensors for all requirements
No matter what the environment or the task demands, proximity sensors from Festo come in a huge range of variants and are ready for practically everything. Our range even has the right accessories for mounting.

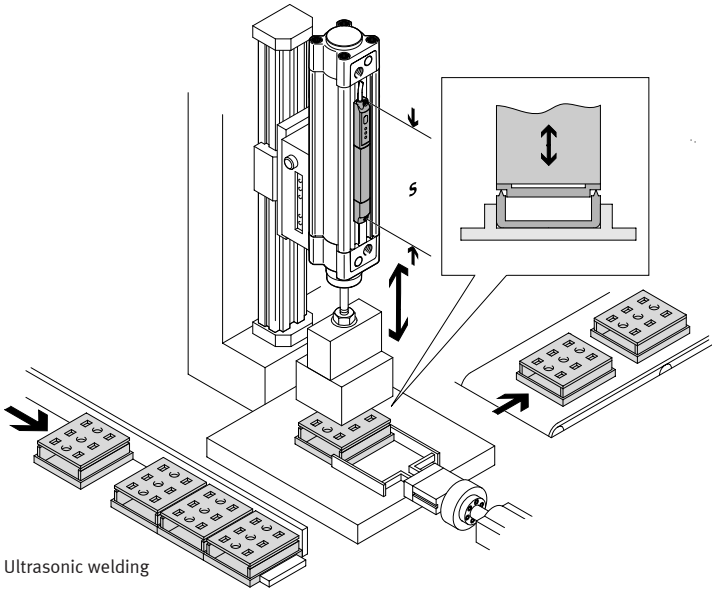
Here are some examples:
- ATEX-certified
- For 230 V AC/DC requirement
- With normally closed/normally open function, e.g. for the food industry
- Resistant to acids and bases
- Resistant to cooling lubricants
- Welding field immune
- For very high temperatures
- For very low temperatures
- Short construction for grippers

Have you not found what you are looking for? Just ask us!

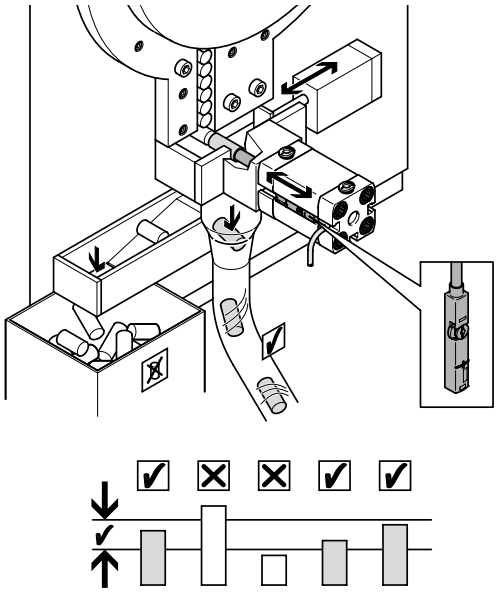
Position transmitters

Position transmitters deliver an analogue, displacement-proportional output signal in the sensing range. The contactless measuring principle ensures wear-resistant sensing, which is a particular advantage in robust environments. As a consistent further development of the binary proximity sensor, position transmitters enable a multitude of new application areas when combined with pneumatic cylinders:

- Quality control
- Ultrasonic welding
- Process control during sheet manufacture or during wear monitoring
- Object sensing during pressing or clamping
- Object sensing when recording positions, when products are changed or when quality-sorting parts



Ultrasonic welding



Quality control

Position transmitter SMAT-8E
The classic standard solution with analogue current and voltage output in one device. The SMAT-8E detects the position of the cylinder piston with great reliability; this position is always known. The very simple and quick installation and the broad range of applications makes it universally applicable.

- Sensing range: 50 mm
- Analogue output: 0 - 10 V, 0 - 20 mA
- Reproducibility: ±0.064 mm

Position transmitter SMAT-8M
As a position transmitter that is the size of a proximity sensor, it is designed for all applications where space is restricted. Its compact construction opens up new areas of application, particularly in terms of compact cylinders and grippers. The position feedback of the piston is produced as an analogue voltage signal.

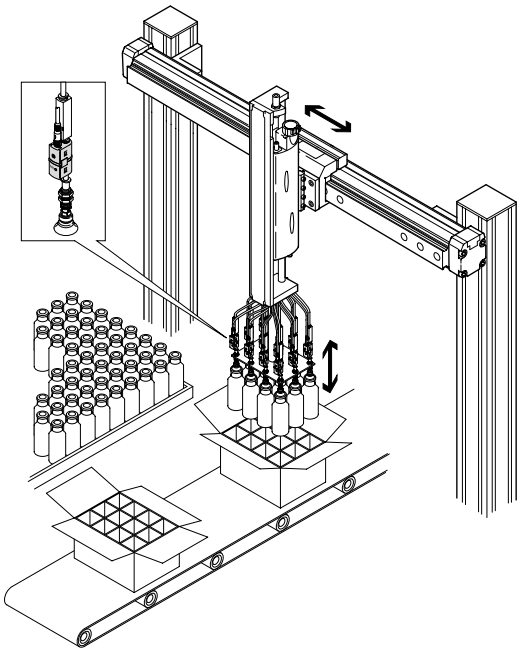
- Sensing range: Up to 40 mm
- Analogue output: 0 - 10 V
- Reproducibility: ±0.1 mm, on grippers ±0.025 mm

Position transmitter SDAT-MHS
The universal transmitter solution. With three options for signal evaluation: classic analogue, programmable switching output or programmable IO-Link output. Programming options: proximity switch, window comparator, hysteresis comparator.The sensing ranges of the transmitter are perfectly tailored to the standard strokes of Festo cylinders.

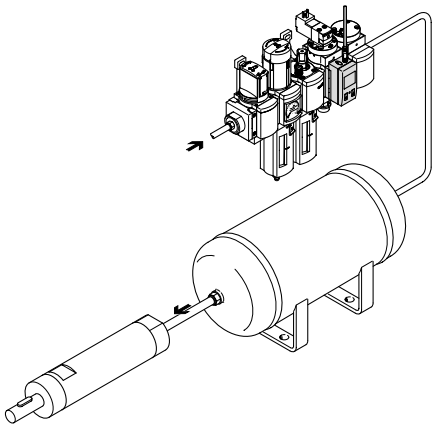
- Sensing range: 50, 80, 100, 125, 150 mm
- Analogue output: 0 ... 20 mA
- Programmable IO-Link/switching output
- Reproducibility: ‹ 0.1 mm

Pressure and vacuum sensors

Efficient and reliable pressure and vacuum monitoring and control, as well as flow monitoring, are indispensable in automation using pneumatics. These extend the range of system applications, ensure greater reliability and offer the option of remote monitoring and maintenance. They are also easy and quick to use thanks to the standardised control and display concept shared by all Festo pressure sensors.



Presence control using pressure and vacuum sensor SDE5



Integrated in a service unit, the pressure sensor SDE1 monitors the pressure range of a pulsed air motor

All fluids: Pressure sensor SPTW
The SPTW is a universal pressure sensor that is highly flexible in its applicability with gas, fluids and air.

- Large pressure measuring range between -1 ... 1 bar to 0 ... 100 bar, depending on the version selected.
- Fast installation thanks to standardised G1/4 air connection, 4-pin M12 plug and standardised 0.1 ... 10 V or 4 ... 20 mA analogue output

Small and simple, but flexible too: Pressure transmitter SPTE
Versatile mounting options and stripped down to the basics for pressure or vacuum monitoring at valves and cylinders. The compact size and minimal weight are ideal, especially for tight installation spaces with high component density.

- Flexible: 3 attachment concepts for fast, low-cost mounting
- Simple: click-mounting and dismounting without tools
- Compact: 8-bracket wall mount for manifold assembly

Price-optimised: Pressure and vacuum switch SDE5
The SDE5 is a cost-effective alternative for simple and quick monitoring. Intelligent, easy to install and reliable, it lends itself to use with compressed air, closed-loop control and vacuum detection as well as object detection via back pressure.

- Selectable output functions
- Patented quality sorting
- Minimum assembly times thanks to QS fittings and M8 plug connectors or free cable end
- Rapid switching-point adjustment by pressing a button
- Measuring ranges: 0 ... -1, -1 ... 1, 0 ... 2, 0 ... 6, 0 ... 10 bar
- Analogue output: 0 - 10 V

Compact and economical: Pressure and vacuum sensor SPAB
Cost-effectiveness and high functionality join forces in the pressure and vacuum sensors SPAB. Although the unit is very compact, all values can be easily read from a multi-coloured, two-part display.

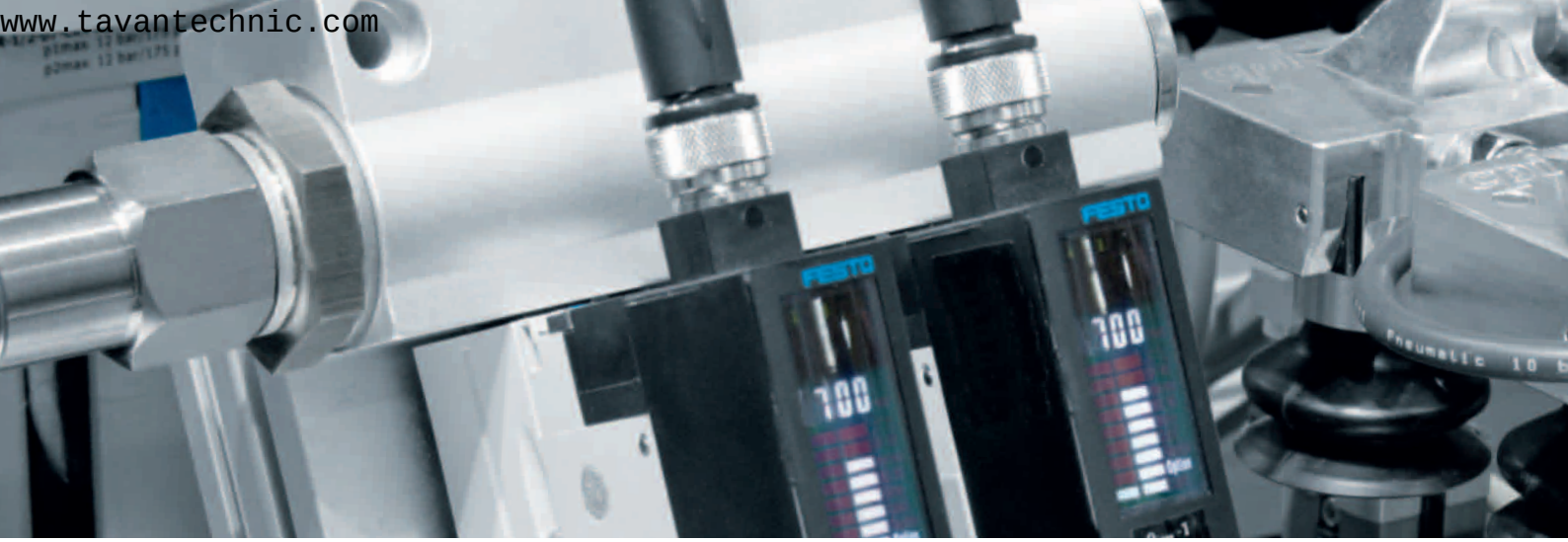
- Pressure supply ports with GPT, NPT, RPT threads
- Electrical connection M8 or cable
- Measuring ranges: -1 ... 1, 0 ... 10 bar
- Analogue and digital outputs
- Pressure units freely selectable
- Optional: adapter plate for connection in very small installation spaces

Highly functional: Pressure and vacuum sensor SDE1
With the SDE1 modular system for pressure measurement, pressure monitoring and sensing, all pressure values are permanently controlled. Thanks to clear 3-key prompting and LCD display, it can be quickly commissioned without the need for operating instructions.

- Front panel, H-rail or mounting for service units D and MS series
- Plug connector M8 or M12
- Freely programmable hysteresis/comparator mode; freely selectable for relative or differential pressure
- Quick mounting via simple insertion or click-in function
- Protection class IP65

Space-optimised: Pressure and vacuum sensor SDE3
Designed for relative and differential pressure sensing by using two independent pressure sensors and LCD display in one unit.

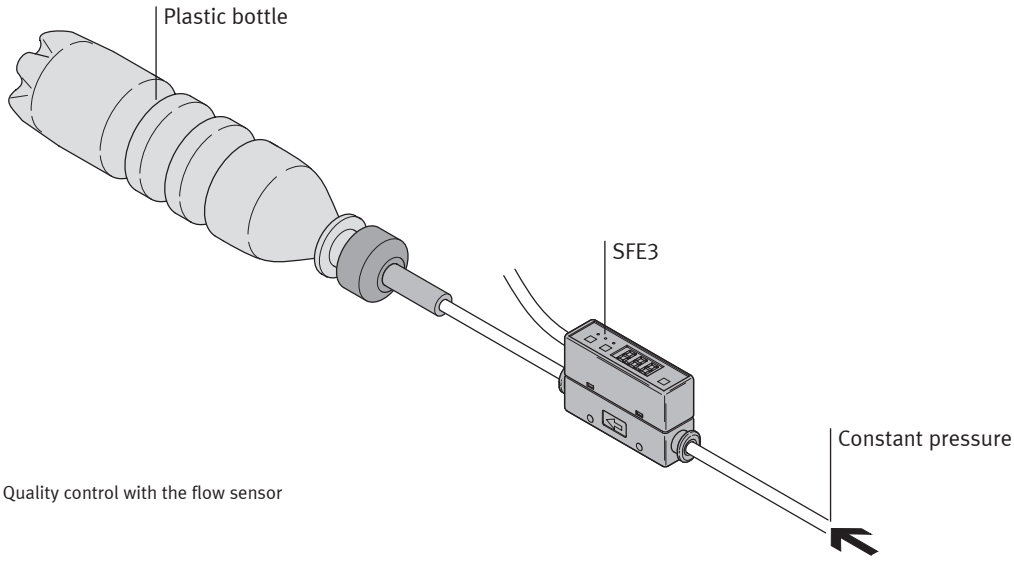
- Space-saving
- Intuitive operation and quick Teach-In option
- Alphanumerical pressure display for dynamic processes via bar chart
- Very quick and easy H-rail and front panel mounting
- Coded lock prevents manipulation and permits reading of the settings



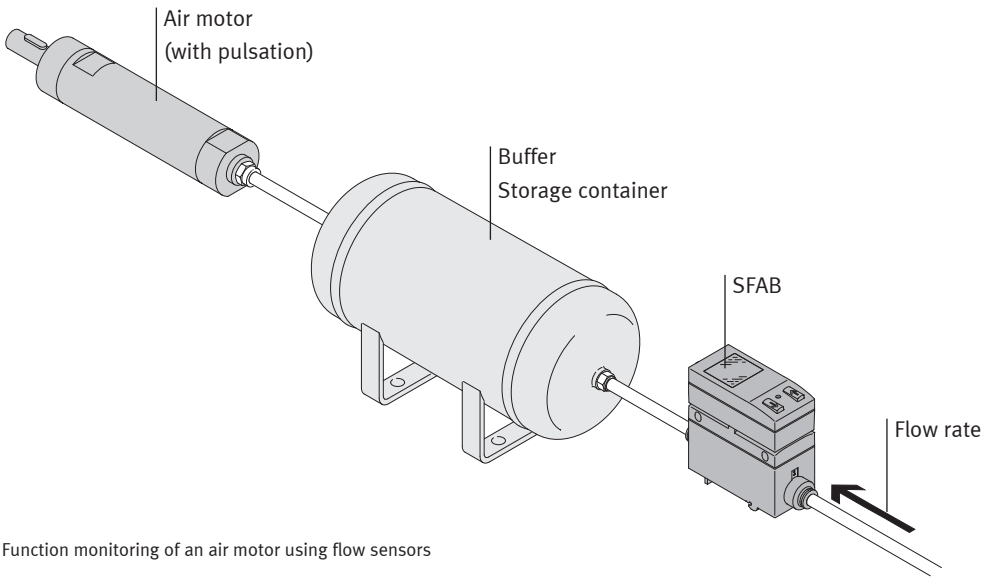
Flow sensors

Simple diagnostics and condition monitoring processes can be achieved by monitoring flow rates. Changing flow values are often an indication of problems ahead.

Areas of application
- Detection of very small parts
- Placement monitoring of components with delicate surfaces
- Placement detection
- Function monitoring
- Leak testing
- Presence control
- Monitoring of energy costs



Quality control with the flow sensor



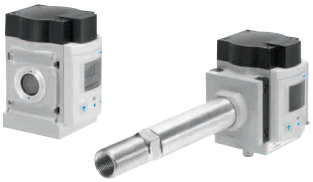
Function monitoring of an air motor using flow sensors

Incredibly compact:
Flow sensors and transmitters SFE3/SFET
Ideally suited for applications in the electronics, light assembly, optical or pharmaceutical industries: the series SFE3 flow sensors.

- SFE3: Unidirectional flow sensor with display, measuring range of 0.05 ... 50 l/min
- SFET: Flow transmitter, optional display, measuring range of 0.05 ... 10 l/min
- Protection class IP40

Impressive, simple, reliable:
Flow sensors SFAB
The new flow sensors with an attractive display and control concept offer leakage detection, leak tightness of end products and flow monitoring.

- Unidirectional flow sensor with display
- 360° rotatable display
- H-rail or wall mounting
- Switching between the 3 standard conditions (DIN 1343, ISO 2533, ISO 6358)
- Measuring ranges: 10, 50, 200, 600, 1000 l/min
- With integrated flow control valve

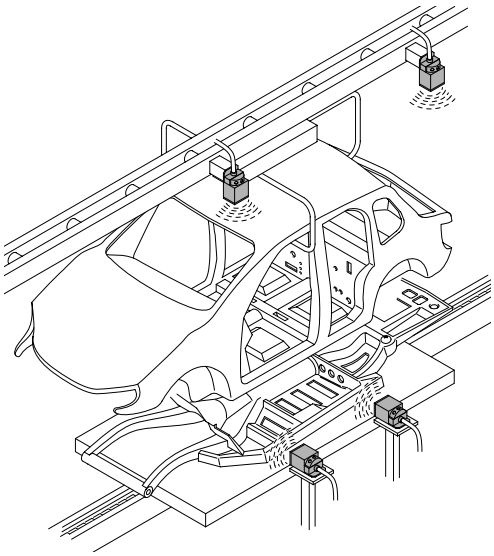


High flow rates, yet compact:
Flow sensors SFAM
The SFAM can be used as a stand-alone device or in combination with MS series service units. A large, illuminated display supplies absolute flow data, consumption data, threshold values and convenient switching-point adjustment.

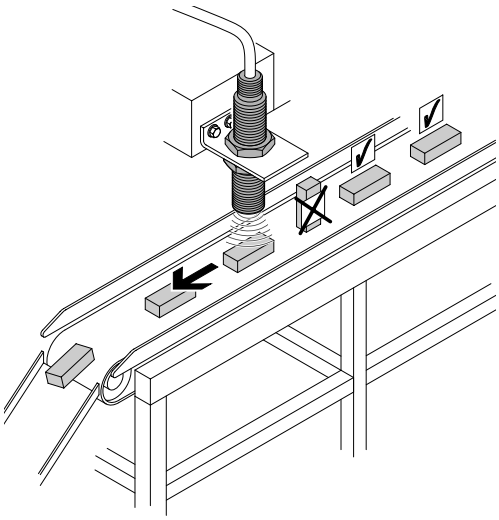
- Switching between the 3 standard conditions (DIN 1343, ISO 2533, ISO 6358)
- Flexible installation thanks to compact design
- Unidirectional flow sensor with display: from left or right – selectable
- Flow ranges: 1000, 3000, 5000, 10000, 15000 l/min

Inductive proximity switches and sensors

The SIE series sensors can detect all metals, with functions ranging from sensing to distance measurement of metallic objects.



Sensing over large distances: Inductive proximity sensor SIEF-Q40



Position detection with the analogue inductive sensor SIEA

Standardised:
Standard inductive proximity sensors SIE..
Standardised, low cost, reliable, simple – suitable for a wide range of applications.

- Diameter of 3 mm to M30
- With plug or cable
- Normally closed or normally open contact
- Flush or non-flush fitting
- High protection class: IP67
- D.C. voltage designs in 3-wire connection PNP and NPN
- LED for switching status display
- Standard-compliant external construction facilitates simple replacement of existing solutions

Made of polyamide:
Inductive proximity sensor SIEN/SIED...-PA
The ultimate low-cost solution for detecting metallic objects.

- Approved for the food and packaging industry, also used in the chemical industry
- Sturdy thanks to the high protection class IP65/IP67
- Standard sizes: M12, M18, M30
- Economical thanks to attractive price/performance ratio

250 % faster: Inductive proximity sensor SIEF Factor 1
The perfect combination of new features – the easiest and most reliable sensor ever.

- Factor 1, identical switching distances for a wide range of different metals
- Considerably greater switching distance compared to standard sensors
- 250 % faster than conventional proximity sensors
- Insensitive to external DC and AC magnetic fields

Square: Sensors SIES (special design)

Square designs in different sizes have been added to the cylindrical designs.

- Thanks to their design, these versions can be mounted directly and are thus extremely space-saving

With analogue output: Inductive sensor SIEA
Simple, economical and precise, ideal for measuring, monitoring and checking functions at 20 mm distance. These SIEA sensors are equipped with an analogue signal which is proportional to distance and offers a voltage and current output.

- Standard sizes: M8, M12, M18, M30
- High resolution and excellent repetition accuracy
- Large sensing range of up to 20 mm (M30)
- Virtually all sizes offer two standard analogue outputs of 4 ... 20 mA and 0 ... 10 V

With stainless steel housing: Inductive sensor SIEH- ... -CR
Sturdy thanks to the all-round enclosed design of the stainless steel housing, including the active surface.

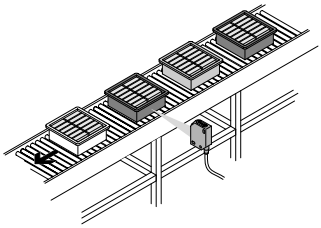
- Solid metal housing V2A-1.4305-AISI303
- For demanding mechanical requirements
- Resists pressure
- Large sensing distances (also for other metals)
- M12, M18, (NO, PNP, NPN, with plug or cable)

Innovative: Inductive proximity sensor SIES-8M
Ideal for sensing intermediate and end positions of electric drives. The only inductive sensor for 8 mm slots with patented status display via two LEDs.

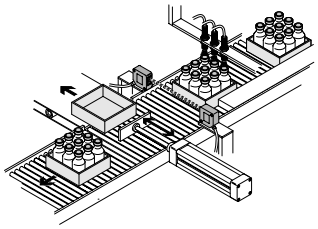
- Tried and tested mounting technology similar to proximity sensors
- Quick positioning and simple mounting using clamping technology
- Perfect visibility, regardless of the direction of approach of the object being sensed
- Repetition accuracy ≤ ±0.05 mm (radial)
- Power supply: 10 to 30 V
- Switching distance: 1.5 mm
- Per EN 60947
- Flush mounting
- Operating temperature: -25 to +70 °C

Optical sensors

Thanks to the optical measuring method, SOE series sensors cover a wide range of functions, from detecting colour and miniature components through to laser distance sensing.



Diffuse sensor with background illumination: Sensing of objects irrespective of the surface and colour



Presence detection in automation technology

Standard-compliant design: Optoelectronic sensors SOEG-...-M12/M18/M18W
Standard-compliant design for simple exchange. Numerous variants such as diffuse sensors, sensors with background suppression, retro-reflective and through-beam sensors, etc.

- Diameters: M12, M18 and M18W (with lateral light emission)
- With plug or cable
- With PNP or NPN output

Miniaturised: Optoelectronic sensors SOE-...-Q20
The new optoelectronic sensor range Q20 with practical Teach-In function. Ideal for restricted installation spaces, offering maximum precision, dynamic process adaptation and maximum ease of use.

- Size 20 x 32 x 12 mm
- High protection class IP67
- Switching frequency of up to 4,000 Hz
- Reliable adjustment via visible red light and laser
- Teach-In via keys, remote control via electrical connection. Integrated protection against manipulation.
- Dynamic Teach-In

Compact design: Optoelectronic sensors SOE-...-Q30
Q30 sensors provide maximum performance in a miniature housing. They are compact, extremely sturdy and offer all protective functions. The complete range consists of sensors, very precise background suppression sensors, retro-reflective sensors, through-beam sensors and fibre-optic units

- Size 30 x 30 x 15 mm
- Resistant to shock and vibration thanks to one-piece moulding
- Precise background suppression
- High operating reserve
- Adjustment via potentiometer

Outstanding: Optical sensors SOE..-Q50
All sensors of the SOE..-Q50 series offer outstanding features such as scaling potentiometers secured against overtravel, numerical scaling, as well as superior display elements and a switching frequency of up to 2,500 Hz.

- Maximum accuracy
- Red light and laser
- Dimensions of just 50 x 50 x 17 mm
- Plug rotatable by 270° for M12 size, in steps of 45°
- Degree of protection IP67
- LEDs for operating status and operating voltage display

Compact: Colour sensor SOEC-RT-Q50
The world's smallest colour sensor. Using just one white light source, and with a standard housing, the SOEC-RT-Q50 can detect objects anywhere within its operating range. Featuring 5 definable limit values, the sensor can be optimally tuned to the colour of the test object.

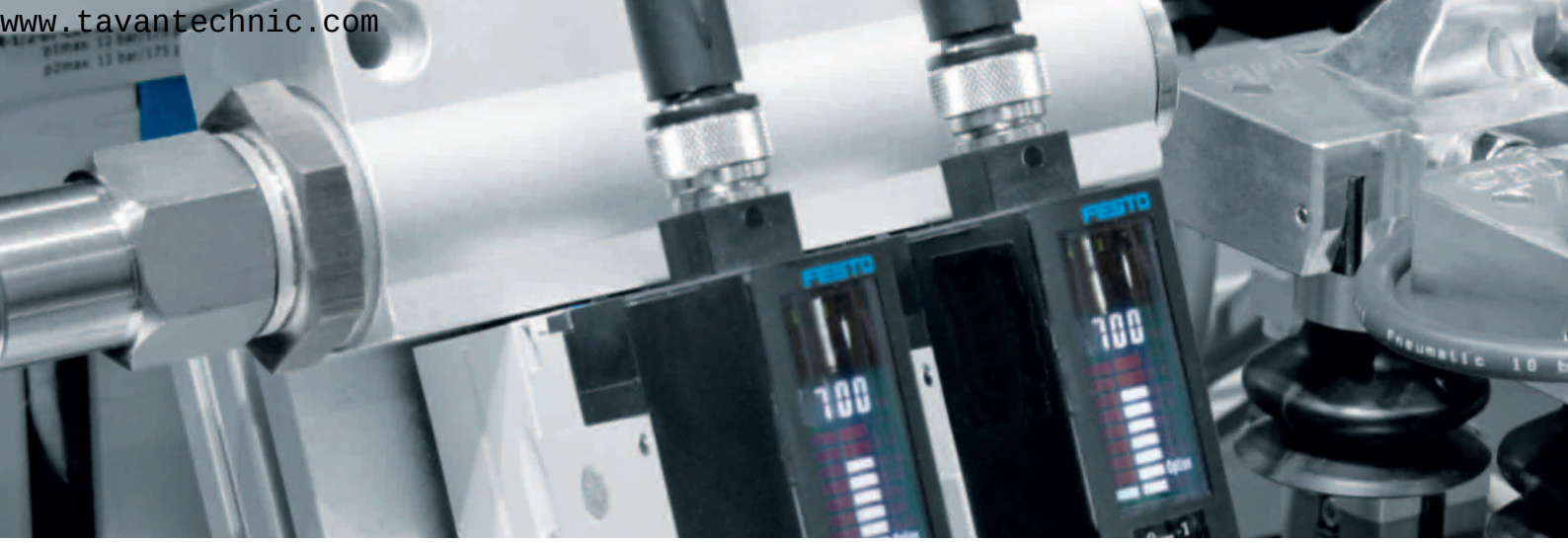
- The sensor can quickly and easily learn to recognise new colours of an object via its Teach-In function.
- 3 independent channels with Teach-In capability
- Switching frequency 500 Hz
- Dimensions of just 50 x 50 x 17 mm

Small and precise: Fibre-optic cables and fibre-optic units SOE4
These provide precise and space-saving position detection on very complex and compact machines, particularly in the electronics and light assembly industries. For detecting small workpieces (any material) at great distances or high temperatures.

- Highly flexible applications thanks to a choice of three fibre-optic units: without display, with display, or with display and analogue output
- Fast and reliable set-up using simple Teach-In method
- Flexible switchover between four operating modes: standard, fine, fast, long distance
- Up to four fibre-optic units mounted next to one another work in synch to avoid mutual interference

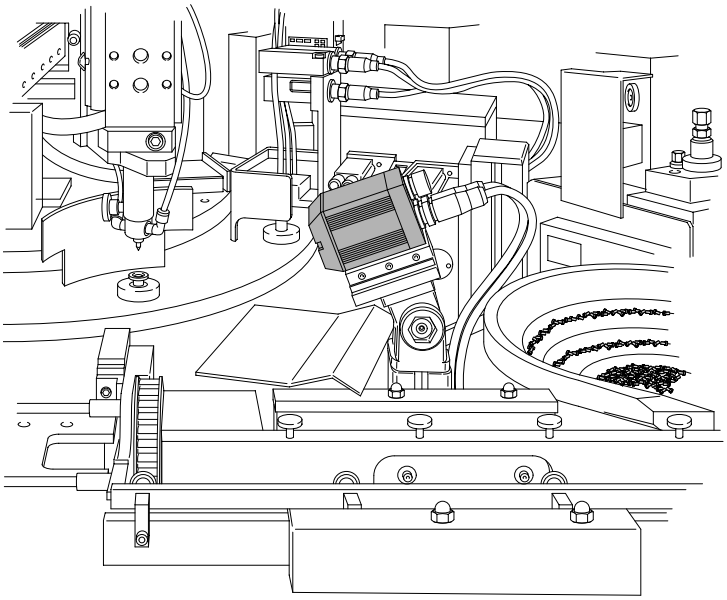
Reliable and efficient: Light barrier sensors SOOF-P and SOOF-M
Easy to install and adjust because emitter and receiver are in a single housing. Traditional metal version or innovative polymer variant with a status display which is visible from all sides.

- Degree of protection IP67
- Fork widths: 30, 50, 80 and 120 mm
- Good visibility thanks to red light
- Numerous mounting types
- Adjustment by means of Teach-In (SOOF-P) or potentiometer (SOOF-M)
- Accurate, with high resolution and repetition accuracy



Compact vision systems

Sheer economy: the innovative and intelligent camera systems. Thanks to the compact, industrial design and clear interface definition, these versatile vision systems can also be easily integrated into existing installations.



For type, position and rotational position detection: the intelligent compact camera system SBO...Q

Camera system SBOC-M/SBOI-M
Designed to support diagnostics and commissioning as well as function monitoring during fast motion sequences. The innovative and low-cost alternative to conventional high-speed cameras.

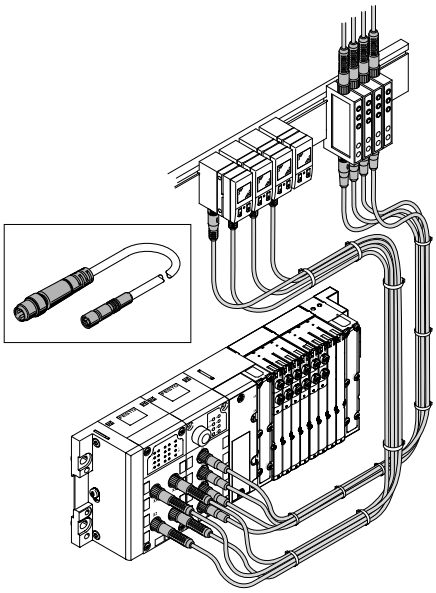
- Integrated electronics to record and save motion sequences
- Several cameras can be networked via Ethernet and temporarily synchronisable
- Lens mounting: C-mount
- Working distance: depending on the selected lens
- Field of vision: depending on the selected lens
- Sensor resolution: 640 x 480 pixels
- Frame rate: 240 ... 2100 fps
- Protection class: IP65/IP67
- High light sensitivity

Camera system SBOC-Q/SBOI-Q
Intelligent vision system for precision positioning of axes, type identification, position detection and 2D quality inspection of moving parts and parts at rest. Plus: OCR and reading 1/2-D code

- Sensor resolutions: 640 x 480, 752 x 480 or 1280 x 1024 pixels (monochrome and colour)
- Standardised software interface using Ethernet, as well as 24 V I/O
- Protection class: IP65/IP67
- Integrated PLC run-time system (CODESYS 2.3)
- CANopen master functionality in connection with CODESYS
- Lens mounting: integrated lens or C-mount
- Compact dimensions, low weight

Connection technology

Fits and functions smoothly: the sensor portfolio from Festo Ideally matched to each other, the modular cable system NEBU connects field devices and controllers – connection problems are a thing of the past.



Connect quickly and easily over ranges of up to 30 m with the modular cable system NEBU

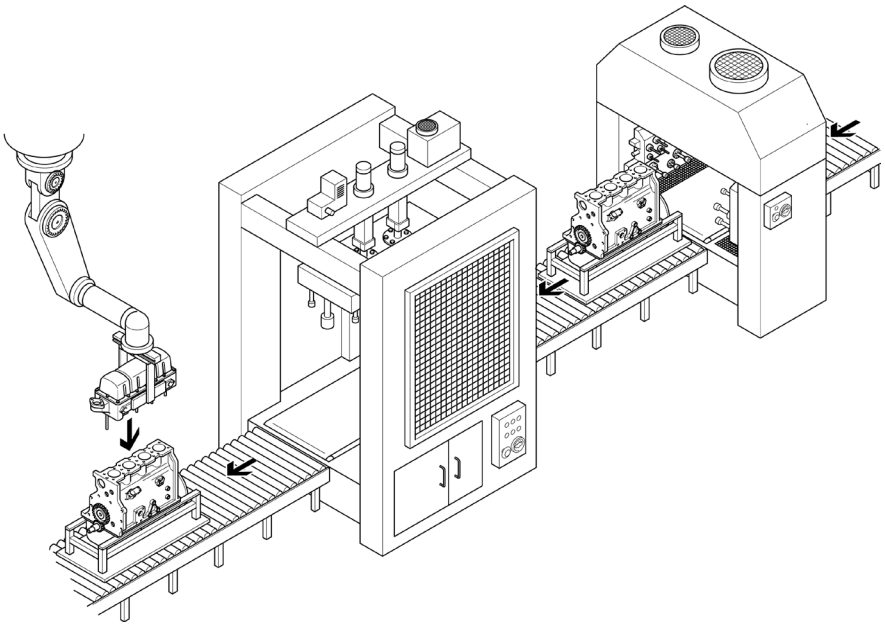
Combination options:
Modular cable system NEBU
Find the ideal connection quickly with the modular system for connecting cables. It provides unlimited combination possibilities including sockets, various cable lengths and qualities, and plugs – inexpensively, reliably and flexibly. Matched to all devices with M5, M8 and M12 plugs such as proximity sensors, position transmitters, pressure and flow sensors, optical and inductive sensors, as well as individual valves. Cable lengths are freely selectable within a range of 0.1 to 30 m.

Remote control:
Signal converter SVE4
The signal converter SVE4 converts the analogue output signal from a sensor into switching points that can be taught in directly on the signal converter. They are ideal wherever the accessibility of sensors is limited.

- Two switching outputs, which can be configured independently of one another as threshold value, hysteresis or window comparators as required
- Quick installation without interrupting the operation of the system
- Simple commissioning thanks to the integrated Teach-In function

Industry-specific sensors

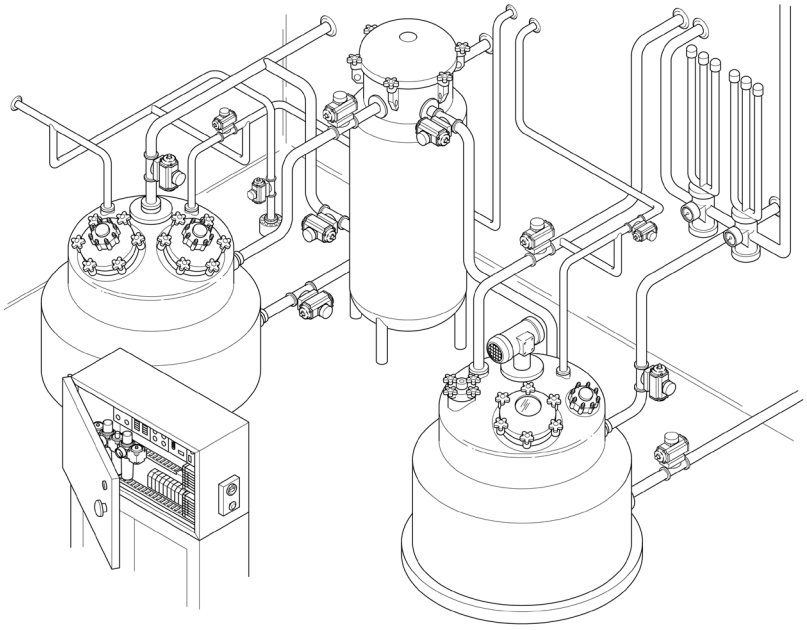
All kinds of industries rely on the first-rate products and services offered by Festo and thus enjoy a mutually beneficial partnership. This also includes application-optimised products for even greater productivity and enhanced process reliability – with everything for process automation and the automotive industry from a single source.



Automotive industry and machine tool industry

Precise and reliable:
Air gap sensors SOPA
The reliable, attractively priced compact solution for workpiece contact monitoring with micron precision when machining engine parts. It comes fully equipped with a controller module, compressed air regulator, measuring air shut-off valve, air jet function and up to 4 measuring modules. An additional advantage: up to 4 air gap sensors can be configured on a modular basis and pneumatically linked.

- Detection of 2 different distances with distance correlation is possible
- Distance detection at workpieces with 2 different types of surface roughness
- Measuring range: 20 ... 200 µm
- Operating pressure: 4 ... 7 bar
- Switching value: ±2.5 µm
- Freely programmable switching function
- Protection: IP65



Automation process

Systematically safe:
Sensor boxes DAPZ, QH-DR-E
Systematic safety in the process industry: reliable, overload-proof and durable end-position detection in valve control systems – even in areas with potentially explosive atmospheres

- Inductive, pneumatic or electrical (microswitch)
- Large visual display, visible from all sides
- Simple mounting options on semi-rotary valve actuators (Namur interface)
- AS-interface variant available
- Can also be used with 3-way ball valves
- Highly flexible: choice of mounting bridges, various voltage ratings, explosion-proof variants

New generation: Sensor boxes SRBP/SRAP
From sensing the mid-position to the analogue feedback signal in 4 ... 20 mA of the valve position, the new sensor boxes offer completely innovative possibilities.

- Reliable Reed (SRBP) and Hall (SRAP) technologies
- Visual position indication in 3D for valve position and flow direction
- Direct mounting on DFPB without adapter bridges
- Adjustable working range 0° ... 270°
- Protection class IP65 and CRC 3
- Explosion-proof for zone II 3 GD
- Optionally with integrated valve port