Customized
Sensors & Components
Made by Endress+Hauser

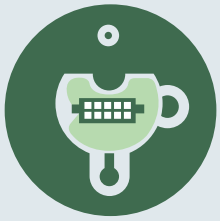
Endress+Hauser
People for Process Automation

High quality for your application and products

The development of technical products and devices is becoming increasingly complex. If you want to develop innovative products quickly and in line with market requirements, you have to master this complexity. In doing so, you must be able to rely on the suppliers of the crucial process components. A technology partnership with Customized Sensors and Components from Endress+Hauser allows you to focus entirely on your core product.

We will supply you with the best fitting sensor for your application. We will be at your side from the initial idea to the consulting phase and joint development effort, through to the manufacture of prototypes and finally series production in the required quantities. Release and approval processes as well as the required certification are key elements of our comprehensive service.

Our role as your technology partner



Engineering

Maximum transparency thanks to clearly defined specifications, deadlines and costs.

Project planning and management by our experts in accordance with agreed framework requirements.

Advice and support services worldwide.

Prototypes and testing

Extensive tests in Endress+Hauser's laboratories: Software and hardware tests, checks to verify mechanical, climatic and electrical integrity (EMC, climate, vibrations).

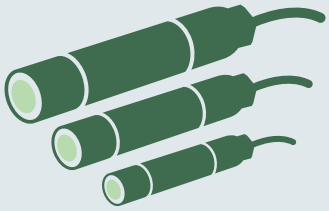
In our modern technology laboratories, we quickly create and optimize functional prototypes.

Engineering geared towards industrial production: The pressure sensor must be easily integrated into your application.

Preemptive measures to ensure that timeconsuming and costly development and design corrections are avoided.

Certification

Guide our customers through the release and approval process based on experience from our core industries.



Serial production

Maximum quality and product safety as sensors are produced under clean room conditions.

High level of automation ensures high and consistent quality.

Coordinated purchase quantities and batch sizes.

Complete traceability of core components.

Review

Zero-defect strategy in serial production: Testing of all the individual components as well as the end product.

Optimum supply chain

Just-in-time delivery and in the quantity required by the specified deadline.

Support for the entire logistics chain worldwide and customer-specific supplychain concepts.

Understand requirements to find suitable solutions

Our success as a supplier of measuring instruments is based on the technological properties of the sensors. The performance of the sensor can be used sustainably in many applications and sectors – whether independently, in the form of a customer-specific pressure transducer or in the mounting and assembly process of the pressure sensor only. Always according to your wishes.

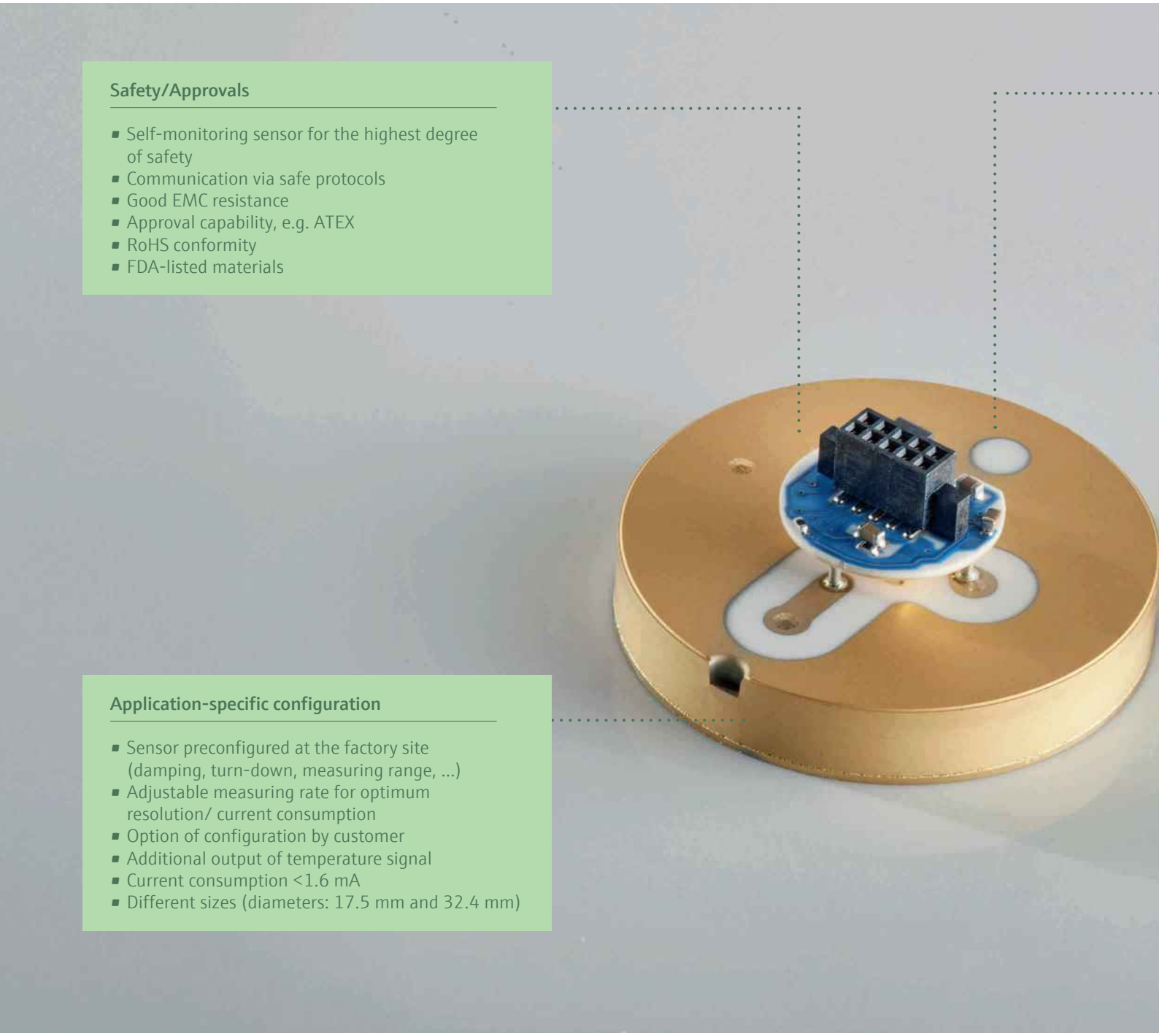
With our high technical competence, far-reaching development experience and reliability in every respect, we understand your individual task and transfer it into convincing technical solutions for your application.

Contact us via
sensors-components.ehlp@endress.com

More information:
www.sensors-components.endress.com/en

Capacitive Ceramic Pressure Sensor: Our basic technology for your success

At the heart of millions of Endress+Hauser pressure gauges and customer-specific applications, the Ceracore capacitive ceramic pressure sensor guarantees cost-effective, reliable and safe process control. The new sensor offers a high performance, more flexible adaptation to your application and configuration capabilities in line with your application. The new generation of the Ceracore pressure sensors guarantees safe measurements and special stability.



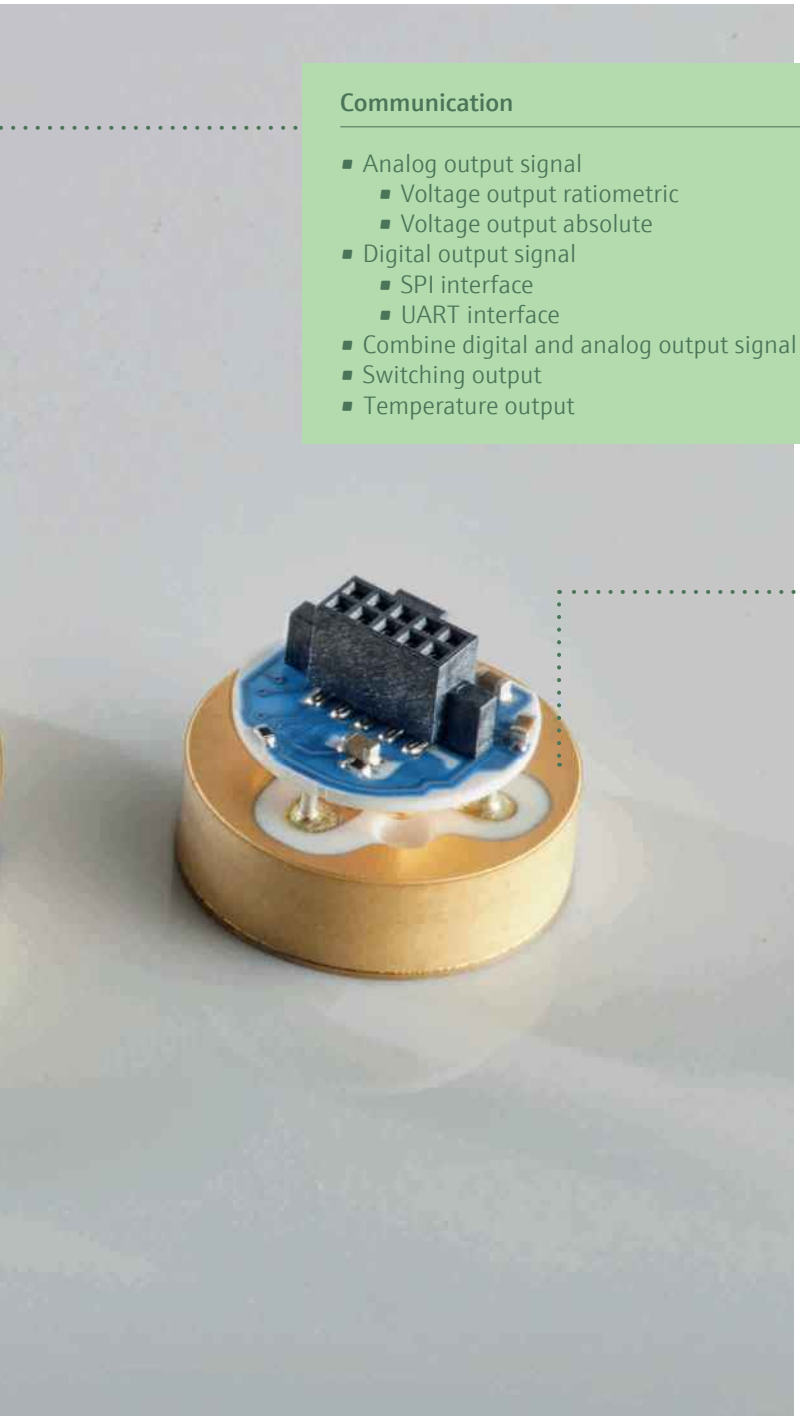
Safety/Approvals

- Self-monitoring sensor for the highest degree of safety
- Communication via safe protocols
- Good EMC resistance
- Approval capability, e.g. ATEX
- RoHS conformity
- FDA-listed materials

Application-specific configuration

- Sensor preconfigured at the factory site (damping, turn-down, measuring range, ...)
- Adjustable measuring rate for optimum resolution/ current consumption
- Option of configuration by customer
- Additional output of temperature signal
- Current consumption <1.6 mA
- Different sizes (diameters: 17.5 mm and 32.4 mm)

- Metallic active solder connection of the ceramic sensor substrate and diaphragm
- Metallic coating of the sensor substrate for improved EMC and reduced installation sensitivity
- Media wetted parts are produced of ultra-pure ceramics (99.9 % Al_2O_3), highly resistant against the most varied process media and chemically neutral
- The Ceracore sensor is a dry sensor without oil filling for pressure transmission and it is highly vacuum resistant
- High overload resistance
- Linearized and temperature-compensated output signal
- Low measuring ranges available
- Reference accuracy: ≤0.1 %



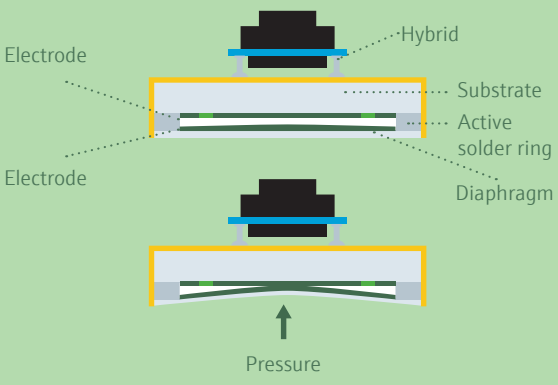
Communication

- Analog output signal
  - Voltage output ratiometric
  - Voltage output absolute
- Digital output signal
  - SPI interface
  - UART interface
- Combine digital and analog output signal
- Switching output
- Temperature output

Technology

The sensor is based on the capacitive measuring principle. The substrate and the diaphragm serve as components of a capacitor. If pressure is applied to the sensor, the distance between the two electrodes changes due to the deflection of the diaphragm. This leads to a change in capacitance which is converted into a nominated electric output signal via an ASIC. (Application Specific Integrated Circuit)

Sensor cross section Ceracore

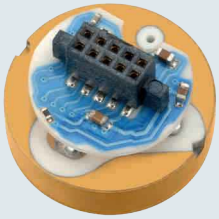


Capacitive ceramic pressure sensors

Ceracore USC30 and USC70 form the basis of all customized pressure transducers. They differ in the size of the sensor and thus the dimensions of the complete pressure transducer. You have the option of developing the housing and process connections by yourself. In that case, we would be pleased to supply our capacitive ceramic pressure sensors configured according to your specifications. We could also supply you with the mounting parts for a perfect fit.

Ceracore USC30

Capacitive ceramic pressure sensor for absolute and gauge pressure measurement.



Design size

External diameter: 17.5 mm

Standardized measuring ranges

- 0...100 mbar / 10 kPa / 1.5 psi, overload range: 4 bar / 400 kPa / 60 psi
- 0...200 mbar / 20 kPa / 3 psi, overload range: 5 bar / 500 kPa / 75 psi
- 0...400 mbar / 40 kPa / 6 psi, overload range: 6 bar / 600 kPa / 90 psi
- 0...1 bar / 100 kPa / 15 psi, overload range: 10 bar / 1 MPa / 150 psi
- 0...2 bar / 200 kPa / 30 psi, overload range: 18 bar / 1.8 MPa / 270 psi
- 0...4 bar / 400 kPa / 60 psi, overload range: 25 bar / 2.5 MPa / 375 psi
- 0...10 bar / 1 MPa / 150 psi, overload range: 40 bar / 4 MPa / 600 psi
- 0...20 bar / 2 MPa / 300 psi, overload range: 40 bar / 4 MPa / 600 psi
- 0...40 bar / 4 MPa / 600 psi, overload range: 60 bar / 6 MPa / 900 psi
- 0...100 bar / 10 MPa / 1500 psi, overload range: 150 bar / 15 MPa / 2,250 psi

Operating conditions

- Process temperature: -20...+80 °C (extended temperature range* -40...+125 °C)
- Ambient temperature: -20...+80 °C (extended temperature range* -40...+125 °C)
- Storage temperature: -40...+125 °C
- Turn-Down possible up to 5:1**

Output signal and energy supply

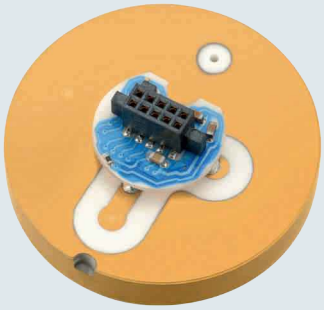
- Supply voltage: 2.9 to 5.5 V DC
- Current consumption: <1.6 mA
- Ratiometric or absolute analog output signal
- Digital interface: UART or SPI
- Pressure signal: 24 bit
- Temperature signal (optional): 16 bit
- Measuring rate: 1.25 to 80 ms
- Reference accuracy: ≤0.1 %

* On request

** Specifications at turn-down according to technical specification (TI)

Ceracore USC70

Capacitive ceramic pressure sensor for absolute and gauge pressure measurement.



Design size

External diameter: 32.4 mm

Standardized measuring ranges

- 0...100 mbar / 10 kPa / 1.5psi, overload range: 4 bar / 400 kPa / 60 psi
- 0...250 mbar / 25 kPa / 4 psi, overload range: 5 bar / 500 kPa / 75 psi
- 0...400 mbar / 40 kPa / 6 psi, overload range: 8 bar / 800 kPa / 120 psi
- 0...1 bar / 100 kPa / 15 psi, overload range: 10 bar / 1 MPa / 150 psi
- 0...2 bar / 200 kPa / 30 psi, overload range: 18 bar / 1.8 MPa / 270 psi
- 0...4 bar / 400 kPa / 60 psi, overload range: 25 bar / 2.5 MPa / 375 psi
- 0...10 bar / 1 MPa / 150 psi, overload range: 40 bar / 4 MPa / 600 psi
- 0...40 bar / 4 MPa / 600 psi, overload range: 60 bar / 6 MPa / 900 psi

Operating conditions

- Process temperature: -20...+80 °C (extended temperature range* -40...+125 °C)
- Ambient temperature: -20...+80 °C (extended temperature range* -40...+125 °C)
- Storage temperature: -40...+125 °C
- Turn-Down possible up to 5:1**

Output signal and energy supply

- Supply voltage: 2.9 to 5.5 V DC
- Current consumption: < 1.6mA
- Ratiometric or absolute analog output signal
- Digital interface: UART or SPI
- Pressure signal: 24 bit
- Temperature signal (optional): 16 bit
- Measuring rate: 1.25 to 80ms
- Reference accuracy: ≤0.1 %

* On request

** Specifications at turn-down according to technical specification (TI)

Customized pressure transducer: The solution for pressure measurement of liquid and gaseous media

The core element of the modular UTC30 is the USC30 capacitive ceramic sensor. The pressure transducer UTC30 is available in different housing variants up to a complete customer-specific transducer. The process connection and the electrical connection are freely configurable. Every pressure transducer is individually temperature compensated and linearized at the factory.

Your benefits

- Dry capacitive ceramic sensor with high-purity (99.9%) Al_2O_3 ceramic diaphragm
- High overload resistance
- Very good long-term stability
- High corrosion resistance
- Absolute and gauge measuring ranges from 0...0.1 bar (0...1.5 psi) to 0...100 bar (0...1500 psi)
- Reduced installation effects through optimized AVT
- Highly automated manufacturing processes
- Factory adjustment of zero point and span
- Tooling Kits: Prepared software bundles and electronic kits for quick and easy integration into customer systems

Safety/Approvals

- ATEX / IECEx component approvals
- RoHS / REACH compliant
- Materials in contact with the process suitable for FDA requirements or hygiene applications
- Optimized electronics with enhanced EMC protection
- Suitable for custody transfer and MID applications

Design/mechanics

- Various process connections (including hygienic design)
- Open modular system with options to weld or screw the back side
- Potting-capable design
- Closed variants with M12x1 connector, cable gland, or as level probe design
- Customized designs available

Electrical connection

- Socket strip 2x5 pins (1.27 mm pitch)
- Pin strip 2x5 pins and 2x2 pins (2.54 mm pitch)
- Plug M12x1 (8-pole)
- Cable assembly
- Customized versions are possible

Output signals

- Digital: SPI or UART
- Voltage output: ratiometric or absolute
- Current output 4...20 mA
- Temperature output
- Switching output

Capacitive ceramic pressure transducer

Ceracore UTC30

Capacitive ceramic pressure transducer for absolute and gauge pressure measurement based on the USC30 sensor.

Design size

- External diameter: ≥22 mm
- Length depends on mechanical design*
- Various process connections selectable (including hygienic design)*

Standardized measuring ranges

- 0...100 mbar / 10 kPa / 1.5 psi, overload range: 4 bar / 400 kPa / 60 psi
- 0...200 mbar / 20 kPa / 3 psi, overload range: 5 bar / 500 kPa / 75 psi
- 0...400 mbar / 40 kPa / 6 psi, overload range: 6 bar / 600 kPa / 90 psi
- 0...1 bar / 100 kPa / 15 psi, overload range: 10 bar / 1 MPa / 150 psi
- 0...2 bar / 200 kPa / 30 psi, overload range: 18 bar / 1.8 MPa / 270 psi
- 0...4 bar / 400 kPa / 60 psi, overload range: 25 bar / 2.5 MPa / 375 psi
- 0...10 bar / 1 MPa / 150 psi, overload range: 40 bar / 4 MPa / 600 psi
- 0...20 bar / 2 MPa / 300 psi, overload range: 40 bar / 4 MPa / 600 psi
- 0...40 bar / 4 MPa / 600 psi, overload range: 60 bar / 6 MPa / 900 psi
- 0...100 bar / 10 MPa / 1500 psi, overload range: 150 bar / 15 MPa / 2250 psi

Operating conditions

- Process temperature range: -20...+80 °C (extended temperature range -40...+125 °C)
- Ambient temperature range: -20...+80 °C (extended temperature range -40...+125 °C)
- Storage temperature range: -40...+125 °C
- Turndown possible up to 5:1**

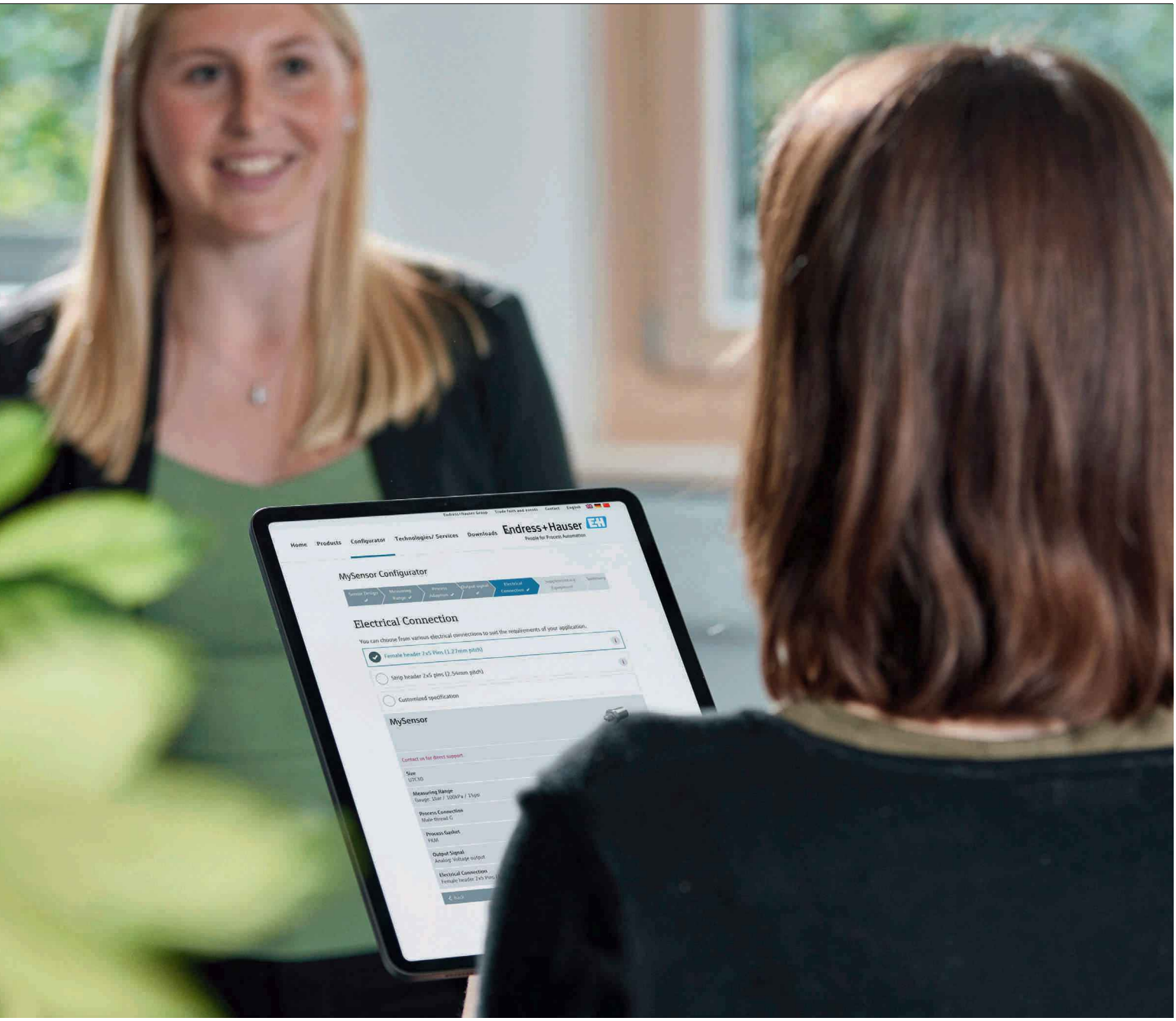
Output signal and power supply

- Supply voltage: 2.9 to 5.5 V DC
- Current consumption: <1.6 mA
- Analog output:
  - Voltage output: ratiometric or absolute
  - Current output 4...20 mA
- Digital interface: UART or SPI
- Print signal: 24 bit
- Temperature signal (optional): 16 bit
- Measurement rate: 1.25 to 80 ms
- Reference accuracy: ≤0.1 %

ATEX / IECEx component approvals for UTC30 available

* According to technical specification (TI)

** Specifications at turn-down according to Technical Specification (TI)



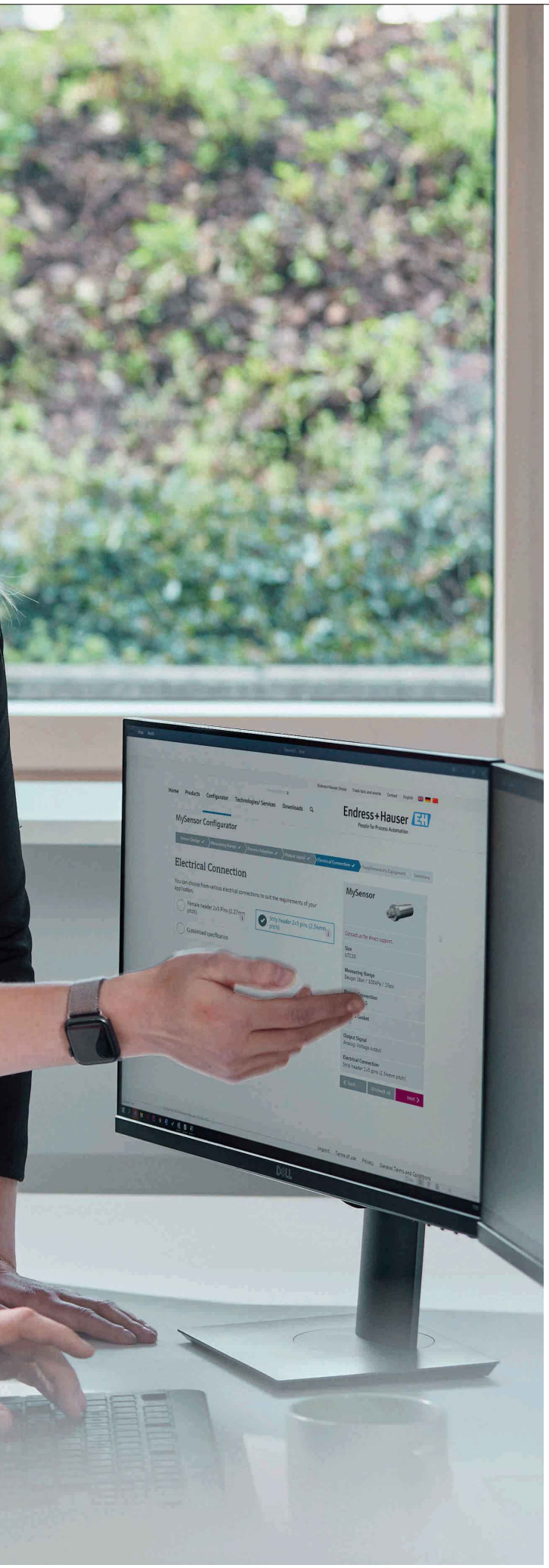
The MySensor concept: Your choice

Process adaption
You may choose from all common process connections and the most varied sealings. The complete pressure transducer must finally fit into your product. We help you to achieve this objective. There are almost no limits in relation to the external form of the pressure sensor.

Measuring range
With the technology you can measure pressure ranges from 100 mbar to 100 bar absolute or relative pressure. There are a standardized measuring ranges within the 100 bar are available. Customized measuring ranges are adjustable. We match the performance of the measuring cell to the requirements of your application. You get what you actually need.

Electric connection
You may choose from different connection options (plug/cable). Select also from the various output signals – analog or digital.

Additional options
In many industries, certification and approvals play a decisive role. Select from different certification options and order final inspection protocols, certificates and documentation.



The MySensor concept: Our configurator

Take advantage of the modular options and create a first version of your sensor with our configurator. After a few clicks you will receive a transducer that will meet your expectations and is tailored exactly to your application. Based on the first configuration we work out your final pressure transducer together with you.

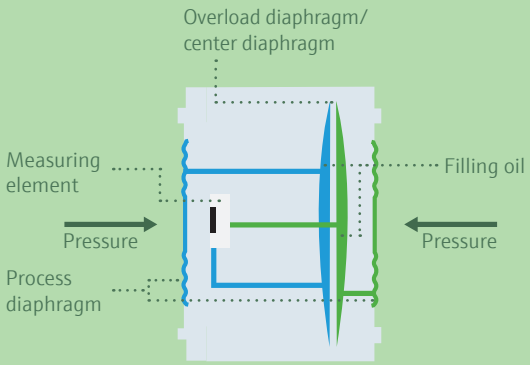
More information:
www.sensors-components.endress.com/en/configurator/

Silicon differential pressure sensor

The differential pressure sensors Deltacore USD50B and USD70 are the base for building high-quality differential pressure transmitters. The piezoresistive sensors with welded metal diaphragm are typically used in the process and environmental industries. Applications are level, volume or mass measurement in liquids, differential pressure monitoring (e.g. of filters and pumps) as well as flow measurement (volume or mass flow). The sensors are uncompensated and can be compensated and calibrated by the customer for the relevant application.

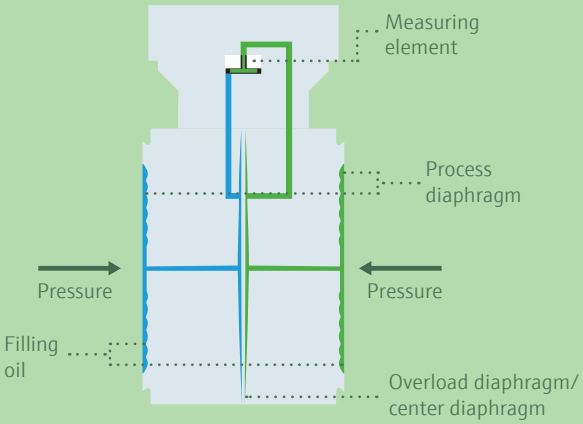
Technology

Sensor cross section Deltacore USD50B



Technology

Sensor cross section Deltacore USD70



Silicon differential pressure sensor

Deltacore USD50B

Differential pressure sensor for a variety of applications.

Your benefits

- Silicon differential pressure sensor
- Uncompensated bridge output signal (mV/V) with stranded cable
- Measuring ranges from 100 mbar to 40 bar
- High accuracy, reproducibility and long-term stability
- Version in 316L (stainless steel)
- Various diaphragm materials and filling oils can be selected
- High overload resistance of 160/420 bar (on one side)
- 240/630 bar (both sides)*

Design size

- Ø 55 mm x 40 mm

Standardized measuring ranges

- 0...100 mbar / 10 kPa / overload range: 160 bar (one side), 240 bar (both sides)
- 0...500 mbar / 50 kPa / overload range: 160 bar (one side), 240 bar (both sides)
- 0...3 bar / 300 kPa / overload range: 160 bar (one side), 240 bar (both sides)
- 0...16 bar / 1.6 MPa / overload range: 160 bar (one side), 240 bar (both sides)
- 0...40 bar / 4 MPa / overload range: 160 bar (one side), 240 bar (both sides)

An increased overload range of 420 bar (one side*), 630 bar (both sides*) is available as an option.

Operating conditions

- Process temperature range: -40...+85 °C
- Ambient temperature range: -40...+85 °C
- Storage temperature range: -40...+85 °C

Output signal and power supply

- Recommended: Constant current supply <1 mA
- Bridge resistance: 4.3...5.6 kΩ (25 °C)
- Output signal:
  - 100 mbar: 21...27 ±mV (span)
  - 500 mbar / 3 bar / 16 bar / 40 bar: 51...55 ±mV (span)

* in reference installation

Deltacore USD70

Differential pressure sensor for small measuring ranges with high overload resistance.

Your benefits

- Silicon differential pressure sensor
- Uncompensated bridge output signal (mV/V)
- Measuring ranges 10 mbar and 30 mbar
- High accuracy, reproducibility and long-term stability
- Version in 316L (stainless steel)
- Various diaphragm materials and filling oils can be selected
- High overload resistance

Design size

- Ø 55 mm x 40 mm

Standardized measuring ranges

- 0...10 mbar / 1 kPa / overload range: 160 bar (one side), 240 bar (both sides)
- 0...30 mbar / 3 kPa / overload range: 160 bar (one side), 240 bar (both sides)

Operating conditions

- Process temperature range: -40...+85 °C
- Ambient temperature range: -40...+85 °C
- Storage temperature range: -40...+85 °C

Output signal and power supply

- Recommended: Constant current supply <1 mA
- Bridge resistance: 4.5...5.6 kΩ (25 °C)
- Output signal:
  - 10mbar: 9...19 ±mV (span)
  - 30 mbar: 18...34 ±mV (span)

Radar module and radar sensor: Simple implementation with a wide range of possible uses

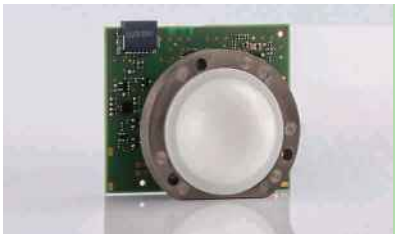
With the free-radiating radar module UTR30, we offer you a real all-rounder, which is particularly suitable for level monitoring in liquids or solids. The continuous, non-contact measurement according to the time-of-flight principle enables precise measurement in tanks and silos up to 35 meters deep as well as the measurement of water levels. In addition, the radar measurement technology is ideally suited to cope with challenges such as movements in the tank, rapid temperature changes or rough weather conditions. The UTR30 is available in various versions from a pure sensor to a customer-specific radar module with a defined electrical interface.

Technical data

- Measurement distance: 0-35 m
- Accuracy: ±2 mm (fluids),
  ±10 mm (solids)
- Beam angle: 8°
- Operating temperature: -40 °C...+85 °C
- Medium: liquids & solids with DK >1,9
- Supply voltage radar sensor:
  - Digital 1.8...3.3 V (MCU)
  - Analog 3.5...5.5 V (RF)
- Output signal:
  - Digital UART (8N1 inverted; 230 kBaud)
  - RS422 (M12)

Safety/Approvals

- Radio approval ETSI EN 302 729 compliant
- Radio approval on sensor base (FFC, ISED)
- RoHS /REACH compliant



The USR30 radar sensor is the smallest size in our radar family. It offers the complete functionality of the UTR30 but without the housing. For further processing, the output signal is provided as UART.

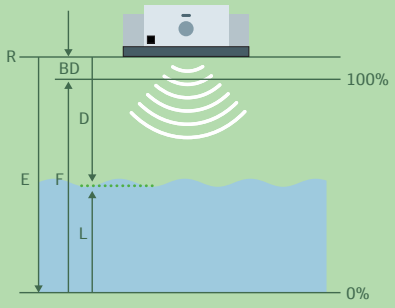
Application-specific configuration

- Housing design
- Electrical connection (M12, etc.)*
- Process connection*
  - G 1 ½"
  - MNPT 1 ½"
- Optionally selectable communication interfaces

*further options on request

Technology/parameterization

- Time-of-Flight method (ToF)
- Radar (FMCW, 80 GHz)
- Easy parametrization:
  - Medium (solid/liquid)
  - Sensitivity (low/medium/high) dependent on turbulence such as dust or waves



Calibration parameter

R: Reference point
BD: Blocking distance
E: Empty calibration (= zero)
F: Full calibration (= span)
D: Measured distance
L: Level (L=E-D)

Applications

Your specifications count, irrespective of the industry

The high product quality of sensors and components and the pertaining precision and durability reduce costs during the entire life cycle of your product and underline the claim of your products concerning reliability and safety. We are at home in the following industries, have profound knowledge of requirements at our disposal, guarantee safety and offer you qualified support.

Energy Industry

Environmental Industry

Shipbuilding Industry

Life Sciences

Medical Technology

The Endress+Hauser Group

Endress+Hauser is a global leader in measurement and automation technology for process and laboratory applications. The family company, headquartered in Reinach, Switzerland, achieved net sales of more than 3.7 billion euros in 2024 with a total workforce of almost 17,000.

Endress+Hauser devices, solutions and services are at home in many industries. Customers thus use them to gain valuable knowledge from their applications. This enables them to improve their products, work economically and at the same time protect people and the environment.

Endress+Hauser is a reliable partner worldwide. Its own sales companies in more than 50 countries as well as representatives in another 70 countries ensure competent support. Production facilities on four continents manufacture quickly and flexibly to the highest quality standards.

Endress+Hauser was founded in 1953 by Georg H Endress and Ludwig Hauser. Ever since, the company has been pushing ahead with the development and use of innovative technologies, now helping to shape the industry's digital transformation. 8,900 patents and applications protect the Group's intellectual property.

Endress+Hauser manufactures level instruments and pressure gauges at the Product Center in Maulburg.

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