

SIEMENS



Process instrumentation

Offering 100% dependability under pressure

SITRANS P: rugged, accurate and user-friendly
pressure transmitters for all applications.

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Answers for industry.

The portfolio for your process requirements

The SITRANS P family

Every process, every facility, and every environmental constraint brings its own special requirements. For this reason, we have developed SITRANS P pressure transmitters to offer you a complete family of devices with different performances, different capacities, and different materials. Devices for your process – from basic to high-end.



Our SITRANS P transmitters stand for measurement precision, ruggedness and maximum user-friendliness. And of course, when it comes to international approvals or industry standards, our measuring devices reliably meet the demands of the increasingly complex tasks found in the process industry.

For this reason, we have developed products that also offer you comprehensive diagnostic functions: warnings and alarms of critical values that can be used for plant monitoring. Thanks to self-diagnostics, service or calibration intervals can be displayed via maintenance timers.

See for yourself the benefits of the SITRANS P family of pressure transmitters.

SITRANS P sets standards

■ Simple operation

The high-end devices of the SITRANS P portfolio offer user-friendly and simple operation with three push buttons in combination with a graphics-enabled local display.

■ High quality

With their aluminum or stainless steel housings, the SITRANS P devices are outstandingly resistant to external influences. Product versions with welded measuring cells do not require additional seal replacements and thus are able to reduce maintenance time and costs.

■ They can handle everything

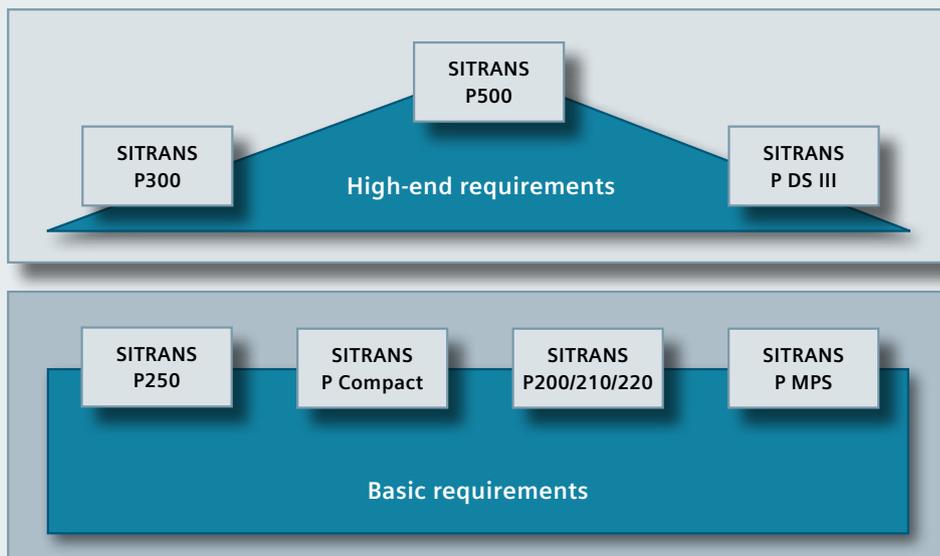
A SITRANS P offers extreme chemical and mechanical resistance and is not affected by high electromagnetic interference.

■ User-friendly and versatile

Depending on the device type, start-up and configuring can vary – from local operation using push buttons, to operation through the process control system using SIMATIC PDM. Thanks to the wide range of available measuring cells and the option of adjusting the measuring range via turndown, a high degree of flexibility is guaranteed for a variety of applications.

■ System-wide communication

In addition to the 4–20 mA current output of the transmitter for basic applications, the devices of the SITRANS P family offer the communication protocols HART, PROFIBUS PA and FOUNDATION Fieldbus. Additional information can be read out, such as “min/max pointers” for pressure and temperature.



The SITRANS P pressure transmitter family

Always the optimal device for all applications, in every industry

The SITRANS P family at a glance:

■ SITRANS P500

The latest differential pressure transmitter with an additional sensor for static pressure offers the performance required to meet the highest demands for accuracy, long-term stability and diagnostics options.

Configuration can be performed via HART or directly on the device using the push button operation concept combined with a graphics-enabled display.

■ SITRANS P DS III

The digital pressure transmitters with HART, PROFIBUS PA or FOUNDATION Fieldbus communication offer comprehensive user-friendliness, diagnostics functions and high accuracy.

■ SITRANS P300

The digital pressure transmitters with HART, PROFIBUS PA or FOUNDATION Fieldbus communication in stainless steel housing for special requirements in food and beverage, water and wastewater, pharmaceutical and biotechnology industries.

■ SITRANS P250

The compact single-range transmitter for measuring differential pressure with a ceramics sensor.

■ SITRANS P Compact

The analog pressure transmitters for basic requirements in food and beverage, the pharmaceutical and biotechnology industries.

■ SITRANS P 200/210/220

The series of single-range pressure transmitters with ceramics and stainless steel measurement cell.

■ SITRANS P MPS

The level transmitter for field-proven hydrostatic level measurement in open containers or wells.

■ SITRANS P280

The digital pressure transmitter with WirelessHART communication offers flexibility, comprehensive user-friendliness, and diagnostics and can operate without cabling for data or power.



The new standard in pressure measurement:

SITRANS P500

Increasing requirements and ever more complex applications also present measuring systems with significant challenges to which they must respond with expanded functionalities – such as improved accuracy and long-term stability. The SITRANS P500 with a new measuring cell and additional static pressure sensor meets the highest demands.

The SITRANS P500 has been developed to meet the highest expectations for measuring accuracy, ruggedness, and user-friendliness, and it merges seamlessly into the SITRANS P family. With the SITRANS P500, you can expect differential pressure measurement at the highest level. It guarantees an accuracy of 0.03% as well as outstanding values for the influence of static pressure and temperature on the measured result. In this way, it guarantees a total performance of 0.09% up to a turndown of 5:1. Since this feature means that only one measuring cell can be used for different measuring ranges, inventory costs can be significantly reduced without sacrificing measurement accuracy for losses in the quality of the measured result. The high long-term stability of the transmitter also reduces maintenance costs thanks to extended calibration intervals, and ensures that you can always rely on the measured results on the long run.

An innovative sensor assembly enables direct connection with process temperatures of up to 125 °C (257 °F) even without a remote seal system. With an improved 3-push button operator input concept for setting the device, the SITRANS P500's host of diagnostics options can be used conveniently without software.

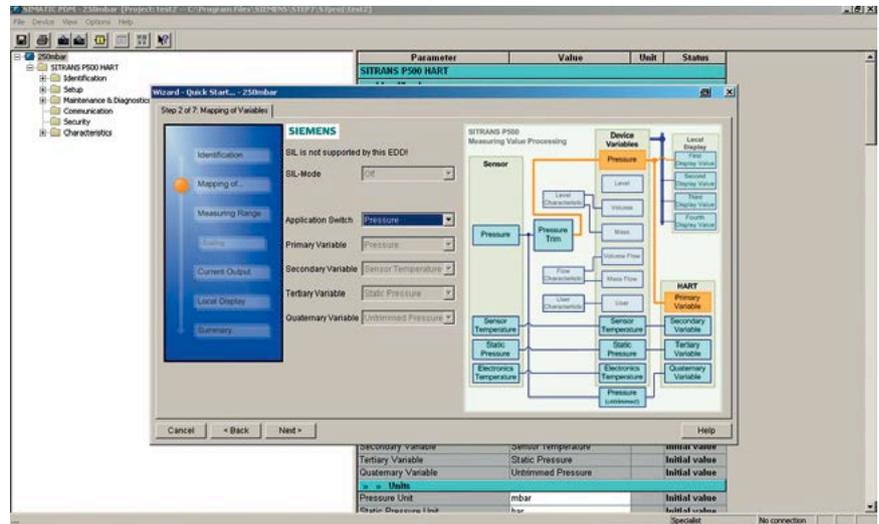
Even curve displays and trend diagrams can be represented on the display for user-friendly process monitoring.

The highlights at a glance:

- Accuracy $\leq 0.03\%$
- Total performance $\leq 0.09\%$ (for turndown up to 5:1)
- Total performance $\leq 0.14\%$ (for turndown up to 10:1)
- Fast response time (T63) < 88 ms
- Extremely good long-term stability 0.05% / 5 years and 0.08% / 10 years
- Turndown up to 200:1
- Static pressure up to 160 bar (2320 psi) possible
- Separate static pressure sensor
- Degree of protection IP66 / IP68 and NEMA 4x
- Process temperature up to 125 °C (257 °F) possible without remote seal
- Configuration via HART with SIMATIC PDM Quick Start Wizard
- Backlit, graphics-enabled display
- Space savings thanks to process flanges of only 86 mm (3.4") in length



Full-text-enabled display



User-friendly HART start-up thanks to SIMATIC PDM rapid Quickstart Wizard

The perfect answer to your requirements:

- Maximum measuring accuracy?**

▶ With an accuracy of 0.03 %, as well as a total performance of 0.09 % the SITRANS P500 offers measuring results which meet the highest requirements.
- Outstanding long-term stability?**

▶ With a long-term stability of 0.05 % / 5 years and 0.08 % / 10 years the SITRANS P500 offers measuring results you can trust on the long run.
- Optimized usability?**

▶ The SITRANS P500 can be set with a high degree of user-friendliness via a full-text-enabled, backlit display and 3 push buttons. The transmitter can also be configured and operated conveniently from the control system using the HART protocol.
- Extensive diagnostics?**

▶ Thanks to the extensive diagnostics options of the SITRANS P500, such as 8 min/max pointers showing the time of the event, you always have your process under control. You are supported here by the innovative EDD* for e.g. SIMATIC PDM with rapid Quickstart Wizard.
- Speed?**

▶ The SITRANS P500 offers you an extremely fast response time (T63) under 88 ms.
- High process temperatures?**

▶ No problem! With direct connection, process temperatures of up to 125 °C (257 °F) can be applied to the SITRANS P500. Much higher temperatures are possible by mounting the transmitter remotely.

*Electronic Device Description

Maximum flexibility for your process:

SITRANS P DS III

The universal device: the SITRANS P DS III is the digital transmitter for gauge pressure, absolute pressure, differential pressure, flow and level, and it is suitable for installations in SIL applications in accordance with IEC 61508/IEC 61511. With diverse communication options, and the innovative PROFIsafe technology, it guarantees the maximum in flexibility and safety.



The SITRANS P DS III offers you simple start-up thanks to the use of only three push buttons with which you set, for example, the zero and span, damping or failure mode. For easily checking the measuring circuits during start-up, the device can be used as a current sender and simulator. Whether you use it for extreme pressures, high temperatures, or aggressive processes, the SITRANS P DS III is predestined for use in safety-related plants – as witnessed by a host of certificates and approvals from all around the world.

The highlights at a glance:

- Extensive diagnostics and simulation functions with PDM
- Accuracy $\leq 0.075\%$
- Long-term stability $\leq 0.25\%/5$ years or even $0.125\%/5$ years
- Wetted parts in stainless steel 1.4404/316L, Hastelloy C276, Monel, Tantalum or Gold
- Measuring ranges from 1 mbar (0.4 inch H₂O) to 700 bar (10,150 psi)

The perfect answer to your requirements:

Different applications?	▶ The SITRANS P DS III offers you versions for gauge, absolute and differential pressure, flow and level measurement.
Safety?	▶ The SITRANS P DS III is suitable for installation in SIL 2 applications in accordance with IEC 61508 / IEC 61511. In the PROFIsafe version, it guarantees maximum communication safety up to the control system level.
Certification?	▶ The SITRANS P DS III has the right certificates (CENELEC, FM, CSA, GOST, NEPSI, INMETRO) or material certificates (acceptance test certificate 3.1, conformance certificate 2.2) ready for your application.
Simulation?	▶ The SITRANS P DS III offers you the option of using a simulation function for loop check functions.
Communication?	▶ HART, PROFIBUS PA, PROFIsafe or FF: the SITRANS P DS III opens up a host of different bus communication options for you.

Controlling sanitary processes –
with flush-mounted process connections:

SITRANS P300

The SITRANS P300 is in demand wherever the highest levels of hygiene and accuracy are required. Its stainless steel housing combined with flush-mounted process connections makes it especially suitable for sanitary measurements in the food and beverage and pharmaceutical industries. With a maximum measurement error of 0.075%, gauge and absolute pressure can be measured with high accuracy.



Thanks to its process connections, built in conformance to sanitary design recommendations, the SITRANS P300 ensures dead-space-free installation at the process. In addition, the approvals in accordance with EHEDG and 3A testify to the excellent surface quality (Ra value $\leq 0.8 \mu\text{m}$ for process wetted parts), FDA-compliant filling oils, and outstanding cleaning characteristics.

The highlights at a glance:

- Especially suitable for CIP/SIP cleaning, and high-viscosity measuring process
- Sanitary stainless steel housing with laser-inscribed rating plate
- High process temperatures to 250 °C (482 °F) possible by means of temperature decoupler and high-temperature oil
- More than 90 different process connection versions offer maximum flexibility
- Higher level of process safety and extended maintenance intervals thanks to laser-welded stainless steel diaphragm at the process connection
- Easy cleaning of the unwetted parts thanks to electro-polished stainless steel housing for degrees of protection to IP69 and IP69K
- Flexible communication link: optionally via HART protocol, PROFIBUS PA or FOUNDATION Fieldbus
- Material of the wetted parts: stainless steel 1.4404/316L

The perfect answer to your requirements:

Sanitary design?	▶ Thanks to its stainless steel construction with flush-mounted sanitary connections and FDA-compliant filling oil, the SITRANS P300 is perfectly suitable for these processes.
Certification?	▶ With sanitation (EHEDG, 3A), material and calibration certificates, the SITRANS P300 is eminently suited to the food and beverage and pharmaceutical industry.
Process connections?	▶ With more than 90 process connections, we offer a host of flange, clamp and threaded connections as standard. Whether pipe or decoupler, the suitable connection is thus always ensured.
High temperatures?	▶ The flush-mounted connections allow process temperatures of 150 °C (302 °F), even in the standard version. Higher requirements up to 250 °C (482 °F) can be met using the available temperature decoupler.
Cleaning?	▶ The SITRANS P300 with stainless steel housing is outstandingly well designed for external cleaning for degrees of protection up to IP69K (high-pressure cleaning). The process wetted parts are optimally suited to CIP/SIP cleaning thanks to the flush-mounted process connections.

Matched to every process:

Extensive accessories

Thanks to a large range of fittings and manifolds, our SITRANS P pressure transmitters can be adapted to the most diverse processes. Our remote seals are used in the case of aggressive, highly viscous process fluids and high temperatures. Flow applications can be engineered using our orifice plates.



Remote seals

Outstanding process durability is guaranteed thanks to a large range of diaphragm materials such as stainless steel, Tantalum, Hastelloy, as well as PTFE and ECTFE coatings. We offer the food and beverage and pharmaceutical industries optimal solutions thanks to sanitary process connections. We also offer high-pressure versions with special flanges for applications in the oil & gas industry. Pressure measurements with high process temperatures of up to 400°C (752°F) are possible thanks to high-temperature filling oils.



Orifice plates

SITRANS P500 and SITRANS P DS III can be used in combination with primary elements to calculate mass and volume flows. The transmitters permit direct parameterization and advanced parameterization using SIMATIC PDM for flow measurements. Thanks to extensive accessories, the transmitter and the primary element can be adapted flexibly. There is a questionnaire for enquiries regarding orifice plates and layouts in accordance with DIN EN ISO 5167.



Fittings and manifolds

For even simpler maintenance of the transmitters in the process, we offer you shutoff valves for gauge, absolute and differential pressure in different versions as 2-, 3- or 5-way manifolds. This enables the transmitter to be separated from the process. Sealing tests and blow-through of effective pressure lines can also be easily implemented. If desired, we can supply the transmitter with the manifold ready-mounted and pressure-tested.

Specialists for basic measuring requirements:

SITRANS P Compact and SITRANS P250

As a single-range transmitter, the SITRANS P Compact combines diverse connections with a compact housing. This makes it especially interesting for the food and beverage and pharmaceutical industries. For differential pressure measurements, on the other hand, the SITRANS P250 is the right choice. As a single-range transmitter with a ceramics cell, it rounds off the portfolio at the bottom end.



SITRANS P Compact

The SITRANS P Compact is an analog transmitter for measuring absolute and gauge pressure for the special requirements of the food and beverage, pharmaceutical and biotechnology industries. It meets the increased sanitary requirements by means of a host of aseptic process connections and housing made from stainless steel (IP67).

The highlights of the SITRANS P Compact:

- Hygienic design in accordance with EHEDG, FDA and GMP recommendations
- Accuracy $\leq 0.2\%$
- Connection and housing of stainless steel 1.4435/316L
- Measuring range between 0 and 40 bar (580 psi)



SITRANS P250

As a compact single-range transmitter, the SITRANS P250 offers an entry to differential pressure measurement. The differential pressure established with a ceramics sensor is converted optionally to a 4–20 mA or 0–5 V or 0–10 V signal.

The highlights of the SITRANS P250:

- Accuracy $\leq 1\%$
- Long-term stability $\leq 0.5\%$ / 12 months
- Connection and housing of stainless steel 1.4305
- Ceramics diaphragm
- Measuring ranges of 0–100 mbar (1.45 psi) and 0–25 bar (363 psi)

SITRANS P200/210/220 and SITRANS P MPS

The compact transmitters of the basic series are equipped with either a stainless steel cell or a ceramics diaphragm, depending on the measuring range. Optimal adaptation to the process is possible thanks to a wide variety of measuring cells. The pressure determined by these sensors is converted optionally to a 4–20 mA or 0–10 V signal. The SITRANS P MPS is available to you for measuring hydrostatic levels.



SITRANS P200/210/220

The SITRANS P200/210/220 is a compact single-range transmitter for measuring absolute and gauge pressure.

The highlights of the SITRANS P200/210/220:

- Measurement error $\leq 0.25\%$
- Long-term drift $\leq 0.25\%$ / 12 months
- Process connection and housing made of stainless steel 1.4404/316L
- 3 series available:
 - SITRANS P200: ceramic diaphragm for measuring ranges ≥ 1 bar and ≤ 60 bar
 - SITRANS P210: stainless steel diaphragm for measuring ranges ≥ 100 mbar and ≤ 600 mbar
 - SITRANS P220: stainless steel diaphragm for measuring ranges ≥ 2.5 bar and ≤ 600 bar, fully welded without internal gasket



SITRANS P MPS submersible transmitter

The pressure transmitter of the SITRANS P MPS series converts the level-proportional hydrostatic pressure to a standard 4 to 20 mA signal.

The highlights of the SITRANS P MPS:

- Accuracy $\leq 0.3\%$
- Long-term stability $\leq 0.2\%$ / 12 months
- Corrosion-resistant materials
 - Housing: stainless steel 1.4404/316L
 - Cable: PE/FEP sheath (halogen-free)
- Measuring range
 - Standard: 2, 4, 6, 10 and 20 m (6, 12, 18, 30 and 60 ft)
 - On request: from 1–200 mH₂O (0–656 ftH₂O)
- Cable length
 - Standard: 10 and 25 m (32 and 82 ft)
 - (special lengths on request)

Wireless communication at field level

SITRANS P280

The SITRANS P280 is a WirelessHART pressure transmitter that provides all measured process values as well as diagnostic information, parameters and functions via radio. The device is powered by an internal battery and designed for ultralow power consumption. The compact and rugged design makes it especially suitable for direct mounting on tanks and pipes in remote parts of plants, and on moving or rotating equipment for process monitoring or asset management applications.



The SITRANS P280 supports the first available industrial wireless communication which is based on an open protocol: WirelessHART.

The highlights at a glance:

- Various pressure ranges available (2, 10, 50, 200, 400 bar selectable)
- LCD display with functional display items and icons, English and German display selectable
- Practical push buttons: Three push buttons for maximum efficiency for setup, diagnostics, communication and security settings with no additional devices or tools
- Maintenance-friendly backlight function
- Sleep mode for efficient battery life management
- Battery status display on LCD and in network overview
- 90 and 180 degree display turnable
- Configurable with standard tools supporting EDD – e.g. with SIMATIC PDM
- Physical HART maintenance port for commissioning
- Measuring accuracy: IEC 60770-1
- Error in measurement (including hysteresis and repeatability): typ. 0.17% of sensor's span, max. 0.25% of sensor's span
- Long-term drift: max. $\pm 0.25\%$ of sensor/year span
- Influence of ambient temperature: typ. 0.07%/10K, max. 0.2%/10K of sensor's span

The perfect answers to your requirements:

Long lifetime of battery



The product was designed completely new for an absolute minimum of power consumption. A high-performance battery allows operation of the device for up to 5 years with a cycle time of 1 update per minute.

Diagnostics



Diagnostic data like the lifetime of the battery is displayed locally as an icon.

Communication



The communication is based on WirelessHART which is part of HART V7. This communication supported by the HART Communication Foundation (HCF) is open and supported by almost all main suppliers for the process industry. This is the basis for interoperability of devices from different suppliers which in general is required by users.

Ease of use



SIMATIC PDM allows an ease-of-use setup of the device based on a modern EDD which supports a quick-setup procedure for first setting of network and measurement parameters via the local HART communication port or over the network. Three push buttons and a local TFT display allow direct configuration.



Haguenau – the SITRANS P production site

One of the production sites of the Siemens Business Unit Sensors and Communication is located in Haguenau, France.

This is where the high-end pressure transmitters of the SITRANS P family are manufactured using the latest production processes: from raw materials processing, through sensor assembly, right up to calibration of the transmitters.

The production plant for the transmitters is set up for customized manufacture. In addition, standard devices are available ex-stock in the Export Center in Nuremberg, Germany.

The ISO 9001 and ISO 14001 certification for the fully developed quality and environmental management system is proof that Haguenau combines quality, flexibility and reliability.

Within a global network of supply centers, the parent plant ensures uniform quality, regardless of whether the final assembly takes place in Haguenau / France, Springhouse / USA or Dalian / China.

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- › Discover how our measuring devices reliably meet the demands of the increasingly complex tasks
- › Make accurate and reliable measuring your recipe for success

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