Pressure Measurement

Transmitters for pressure with WirelessHART communication

SITRANS P280
for gauge and absolute pressure

Overview

SITRANS P280 for flexible and cost-effective applications in pressure monitoring
- Supports the WirelessHART standard (HART V 7.1)
- Very high security level for wireless data transmission
- Built-in local user interface (LUI) with 3-button operation
- Optimum display and readability using graphical display (104 x 80 pixels) with integrated backlight
- Stand-by (deep sleep phase) can be activated and deactivated with push of a button
- Battery power supply
- Battery service live up to 5 years
- Extend battery service life with HART modem interface which can be shut off
- Optimized power consumption through new design, and increase in battery service life.
- Simple configuration thanks to SIMATIC PDM
- Device meets IP65 degree of protection
- Can be used for absolute and gauge pressure measurements

Benefits

The SITRANS P280 is a pressure transmitter that features WirelessHART as the standard communication interface.
Also available is a wired interface to connect a HART modem:
- Flexible pressure measurements
- Save costs on writing for difficult installation conditions. Wireless technology offers cost advantages in cases where extensive wiring cost would normally apply.
- It enables additional hitherto unfeasible measuring points, particularly for monitoring purposes.
- Easy installation on moveable equipment
- Enables cost-effective temporary measurements, for example for process optimizations.
- Optimum solution in addition to wired communication and new possibilities for system solutions in process automation

Application

The SITRANS P280 is a WirelessHART field device for measuring absolute and gauge pressure.
The measuring ranges for absolute and gauge pressure measurements are 0 to 2, 10, 50, 200 and 400 bar (0 to 29, 145, 725, 2900 and 5800 psi).
The sensor is integrated into the transmitter housing.
On the wireless communication side, the transmitter supports the WirelessHART standard. A HART modem can be connected to the transmitter particularly for initial commissioning, alternatively the device can be commissioned comfortably by means of the local pushbuttons w/o any additional handset devices.
It can be used in all industries and applications in non-explosive areas.

Design

The SITRANS P280 has a robust aluminum enclosure and is suitable for outside use. It conforms with the IP65 safety class.
The operating temperature range is -40 to +80 °C (-40 to +176 °F). Power supply is provided through an integrated battery, which is available as an accessory. The device is only approved for operation with this battery.
The aerial features a rotatable joint which can be used for directional alignment. Wireless signals can thus be optimally received and transmitted.
A special highlight is the option for direct operation on the device. The operating strategy used in this case seamlessly integrates into the strategy of all new Siemens field devices.
Using the device’s control buttons, it is easy to turn the HART modem interface of the device on and off. The device can be put to passive status and reactivated at any time. This helps to extend the service life of the battery.
The SITRANS P280 transmitter features a ceramic measuring cell for gauge and absolute pressure measurements.

Function

The SITRANS P280 can join to a WirelessHART network. It can be parameterized and operated through this network. Measured process values are transported via the network to the SIEMENS IE/WSN-PA link.
Field device data received by the IEWSN-PA LINK is transmitted to the connected systems, for example the process control system SIMATIC PCS 7. For an introduction of WirelessHART, please see the FI 01 catalogue, section 9 or http://www.siemens.de/wirelesshart.
Detailed information on IE/WSN-PA can be found in the FI 01 catalogue, section 9 or http://www.siemens.de/wirelesshart.
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Integration

Connecting to SIMATIC PCS 7
The integration of field devices in SIMATIC PCS 7 and other process control systems can now be done seamlessly and cost-effectively with wireless technology, especially in situations where high wiring costs may be expected. Of particular interest are measuring points which are to be added and for which no MSR wiring is available.

Where larger distances between the IW/WSN-PA LINK and control systems need to be overcome, this connection can also be implemented on a wireless and cost-effective basis using the products of the SCALANCE W family.

Configuration

Configuration of the SITRANS P280 may be carried out as follows:
- Initial commissioning for the SITRANS P280 with SIMATIC PDM is generally carried out via a HART modem or the integrated local user interface, since the network ID and join key must be set up on the device before it can be accepted and integrated into the WirelessHART network.
- Once it is integrated into the network, the device can be conveniently operated with the WirelessHART network, the onsite HART modem or via the local user interface.
- Siemens WirelessHART devices operate with optimum coexistence to SCALANCE W family products.

Technical specifications

SITRANS P280 WirelessHART pressure transmitter

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Gauge pressure input

- Measuring range
  - 0 ... 2 bar g
  - 0 ... 10 bar g
  - 0 ... 50 bar g
  - 0 ... 200 bar g
  - 0 ... 400 bar g
- Overload limit/Bursting pressure
  - 5 bar g (72.5 psi g)
  - 50 bar g (363 psi g)
  - 250 bar g (1740 psi g)
  - 650 bar g (7250 psi g)
  - mbar, bar, mmH₂O, inH₂O, atm, Torr, g/cm², kPa, Pa, psi, mmHG, mmH₂O, ftH₂O, inHG, inH₂O

Absolute pressure input

- Measuring range
  - 0 ... 2 bar a
  - 0 ... 10 bar a
  - 0 ... 50 bar a
  - 0 ... 200 bar a
  - 0 ... 400 bar a
- Overload limit/Bursting pressure
  - 5 bar a (72.5 psi a)
  - 50 bar a (363 psi a)
  - 250 bar a (1740 psi a)
  - 650 bar a (7250 psi a)
  - mbar, bar, mmH₂O, inH₂O, atm, Torr, g/cm², kPa, Pa, psi, mmHG, mmH₂O, ftH₂O, inHG, inH₂O

Output

- Output signal: 2.4 GHz Wireless signal with TSMP (Time Synchronized Mesh Protocol)

Measuring accuracy

- Error in measurement (including hysteresis and repeatability, at 25 °C (77 °F))
  - typ. 0.17 % of sensor's span
  - max. 0.25 % of sensor's span
- Long-term drift
  - max. ± 0.25 % of sensor/year span
- Influence of ambient temperature
  - typ. 0.07 %/10K, max. 0.2 %/10 K of sensor's span

Rated conditions

- Ambient conditions
  - Ambient temperature: -40 ... +80 °C (-40 ... +176 °F)
    - (in ambient temperatures below -20 °C (-4 °F) and above +70 °C (158 °F), readability of the display is limited.)
  - Storage temperature: -40 ... +85 °C (-40 ... +185 °F)
  - Relative humidity: < 95 %
- Climatic class 4K4H in accordance with EN 60721-3-4 (stationary use at locations not protected against weather)
- Degree of protection: IP65/NEMA 4
- Allowable media temperature: -20 ... +130 °C (-20 ... +266 °F)
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Design
Enclosure material: low-copper die-cast aluminum, GD-AISi12
Shock resistance: in accordance with DIN EN 60068-2-29 / 03.95
Resistance to vibration: in accordance with DIN EN 60068-2-6/ 12.07
20 ≤ f ≤ 2000 Hz
0.01 g²/Hz
Weight:
without battery: 1.5 kg (3.31 lb)
with battery: 1.6 kg (3.53 lb)
Dimensions (W x H x D):
See Dimensional drawing
Process connection:
- G½B male thread as per EN837-1
- ½-14 NPT
Sensor break: Is recognized
Displays and controls:
- Displays and controls
- Display (with illumination)
  - Size of display: 104 x 80 pixels
  - Number of digits: adjustable
  - Number of spaces after comma: adjustable
Setting options:
- on site with 3 buttons
- with SIMATIC PDM or HART Communicator

Power supply
Battery: 3.6 V DC

Communication
Radio: WirelessHART V7.1 conforming
Transmission frequency band: 2.4 GHz (ISM-Band)
Transmission range under reference conditions:
- Up to 250 m (line of sight) in outside areas
- Up to 50 m (greatly dependent on obstacles) in inside areas
Communication interfaces:
- HART communication with HART modem
- WirelessHART

Certificates and approvals
Wireless communication approvals:
- RATTE
- FCC
Classification according to pressure equipment directive (PED 97/23/EC):
- Gases: Fluid group 1
- Liquids: Fluid group 1; meets requirements as per Section 3, Subsection 3 (sound engineering practice)

Selection and Ordering data
Order No.
SITRANS P280 WirelessHART pressure transmitter (Required battery not included with delivery, see accessories)

Measuring cell filling
Dry measuring cell

Measuring span
Gauge pressure:
0 ... 2 bar g (0 ... 29 psi g)
0 ... 10 bar g (0 ... 145 psi g)
0 ... 50 bar g (0 ... 725 psi g)
0 ... 200 bar g (0 ... 2900 psi g)
0 ... 400 bar g (0 ... 5800 psi g)
Absolute pressure:
0 ... 2 bar a (0 ... 29 psi a)
0 ... 10 bar a (0 ... 145 psi a)
0 ... 50 bar a (0 ... 725 psi a)
0 ... 200 bar a (0 ... 2900 psi a)
0 ... 400 bar a (0 ... 5800 psi a)

Wetted parts
- Ceramic
- Die-cast aluminum

Display
Digital display, visible

Enclosure
Die-cast aluminum

Process connection:
G½ as per EN 837-1
½-14 NPT

 Explosion protection
Without

Antenna
Variable, attached to device

Further designs
Please add `-Z` to Order No. and specify Order code(s) and plain text.

Measuring point number (TAG Nr.):
max. 16 digits entered in plain text
Y15: .................

Measuring point message:
max. 27 characters entered in plain text: Y16: ........................

Accessories
Lithium battery for SITRANS TF280/P280
Order No.

7MP1990-0AA00
7MF4997-1AC

Mounting bracket, steel
7MF4997-1AJ

Mounting bracket, stainless steel
7MF4997-1BB

Cover, die-cast aluminum, without window
7MF4997-1BE

Cover, die-cast aluminum, with window
7MF4997-1DA

IE/WSN-PA LINK
see Sec. 9

HART modem with RS232 interface
7MF4997-1DB

HART modem with USB interface
see Sec. 9

SIMATIC PDM

Available ex stock
D) Subject to export regulations AL: N, EAR 99H.
F) Subject to export regulations AL: 9999, ECCN: N.
SITRANS P280 WirelessHART pressure transmitter, process connection G½”, dimensions in mm (inch)

The dimensional drawing of the mounting bracket see on page 2/146.
SITRANS P280 WirelessHART pressure transmitter, process connection \( \frac{1}{2} \) - 14 NPT, dimensions in mm (inch)

The dimensional drawing of the mounting bracket see on page 2/146.
Fine Controls have been supplying process controls & instrumentation equipment since 1994, & now serves an ever expanding customer base, both in the UK & globally.

We offer a full range of valve & instrumentation products & services, with our product range representing leading technologies & brands:

**Flow:** Flow Meters & Transmitters, Flow Switches, Flow Control Valves & Batch Control Systems

**Temperature:** Temperature Probes & Thermowells, Temperature transmitters, Temperature Regulators & Temperature Displays

**Level:** Level Transmitters & Switches

**Pressure:** Pressure Gauges & Transmitters, Precision & High Pressure Regulators & I-P Converters, Volume Boosters.

**Precision Pneumatics:** Pressure Regulators, I-P Converters, Volume Boosters, Vacuum Regulators

**Valves:** Solenoid & Pneumatic Valves, Control Valves & Positioners, Actuated Ball, Globe or Diaphragm Valves & Isolation Valves

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