Overview

The SITRANS P Compact pressure transmitter is designed for the special requirements of the food, pharmaceutical and biotechnology industries.

The use of high-grade materials guarantees compliance with hygiene regulations.

Particular value has been placed on a high surface quality. It is therefore possible, for example, to guarantee roughness values down to Ra = 0.4 µm (1.57 × 10^{-5} inch) in the wetted area (welded seam area Ra < 0.8 µm (3.15 × 10^{-5} inch)). The system can be electropolished in addition.

A further important feature is the hygiene-based design of the process connection by means of various aseptic connections.

The completely welded stainless steel housing can be designed up to degree of protection IP67.

Using appropriate thermal decouplers, the SITRANS P Compact pressure transmitter can be used for process temperatures up to 200 °C (392 °F).

Benefits

- Measuring ranges from 0 to 160 mbar (0 to 2.32 psi) to 0 to 40 bar (0 to 580 psi)
- Linearity error including hysteresis < +0.2% of full-scale value
- Piezo-resistive measurement system, vacuum-proof and overload-proof
- Hygiene-based design according to EHEDG, FDA and GMP recommendations
- Material and surface quality according to hygiene requirements
- Wetted parts made of stainless steel; completely welded
- Signal output 4 to 20 mA (0 to 20 mA as option)
- Stainless steel housing with degree of protection IP65 (IP67 as option)
- Process temperature up to 200 °C (392 °F)
- Explosion protection II 2G EEx [ib] IIC T6 to ATEX
- Easy and safe to clean

Application

The SITRANS P Compact pressure transmitter is designed for the special requirements of the food, pharmaceutical and biotechnology industries.

The use of high-grade materials guarantees compliance with hygiene regulations.

The SITRANS P Compact pressure transmitter is available in many versions. Exact adaptation of the pressure transmitter to conditions at the place of use is thus possible.

Design

The electronics is potted to protect it against moisture, corrosive atmospheres and vibration.

Notes on operating the pressure transmitter

Compensation of internal atmospheric pressure

Compensation of the internal atmospheric pressure of the SITRANS P Compact pressure transmitters is performed as follows:

- in the plug versions by means of the screwed gland (IP65)
- in the field housings by means of an integral sintered filter (IP65) or a vented cable (IP67)
- in versions with cable outlet by means of a vented cable (IP67)

In the absolute pressure range there is no need for compensation with respect to atmospheric pressure.

Note: These degrees of protection are only achieved under the following conditions:

- if the pressure transmitter is installed correctly
- if the screwed glands are securely tightened
- if the cable diameters agree with the nominal diameters of the gaskets in the housing

Note: The integral EMC measures are only effective if the earth connection is made correctly.

CE marking

The CE marking of the pressure transmitter certifies compliance with the guidelines of the European Council (9/336/EC), the EMC law (13.11.1992), as well as the applicable generic standards.

Interference-free operation in systems and plants is achieved only if the specifications for shielding, earthing, cable routing and electrical isolation are observed during installation and assembly.

Hazardous areas

Note: Electrical equipment in hazardous areas must only be installed and operated by trained personnel.

Modifications to units and connections result in cancellation of the explosion protection and guarantee.

With intrinsically-safe circuits, make sure that equipotential bonding exists throughout the complete cabling inside and outside of the hazardous area. The limits specified in the ATEX approval must be observed.
**Function**

The process pressure acts on a piezo-resistive semiconductor measuring bridge through a remote seal and a transmission liquid. The pressure transmitter converts the pressure values into a load-independent current.

A compensation network makes the output signal largely independent of the ambient temperature. As a result of a specially adapted remote seal connection with minimized volume, the influence of the process temperature on the output signal is greatly reduced compared to a conventional screw connection.

The pressure transmitters can be powered with a non-regulated DC voltage of 10 to 30 V. Output signals common to measuring technology are available.

**Technical specifications**

<table>
<thead>
<tr>
<th>Pressure transmitters for food, pharmaceuticals and biotechnology</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mode of operation</strong></td>
</tr>
<tr>
<td>Measuring principle</td>
</tr>
<tr>
<td><strong>Input</strong></td>
</tr>
<tr>
<td>Measured variable</td>
</tr>
<tr>
<td>Measured range</td>
</tr>
<tr>
<td>0 ... 160 mbar (0 ... 2.32 psi)</td>
</tr>
<tr>
<td>...</td>
</tr>
<tr>
<td>0 ... 40 bar (0 ... 580 psi)</td>
</tr>
<tr>
<td><strong>Output</strong></td>
</tr>
<tr>
<td>Output signal</td>
</tr>
<tr>
<td>• Two-wire system</td>
</tr>
<tr>
<td>• Three-wire system</td>
</tr>
<tr>
<td><strong>Measuring accuracy</strong></td>
</tr>
<tr>
<td>Linearity error including hysteresis (reference point adjustment)</td>
</tr>
<tr>
<td>Adjustment accuracy</td>
</tr>
<tr>
<td>Adjustment time</td>
</tr>
<tr>
<td>Influence of ambient temperature</td>
</tr>
<tr>
<td>On the enclosure</td>
</tr>
<tr>
<td>• Zero</td>
</tr>
<tr>
<td>• Measured span</td>
</tr>
<tr>
<td>On the process connection (remote seal)</td>
</tr>
<tr>
<td>• Flange remote seal</td>
</tr>
<tr>
<td>- DN 25 / 1”</td>
</tr>
<tr>
<td>- DN 32 / 1¼”</td>
</tr>
<tr>
<td>- DN 40 / 1½”</td>
</tr>
<tr>
<td>- DN 50 / 2”</td>
</tr>
<tr>
<td>• Clamp-on seal</td>
</tr>
<tr>
<td>- DN 25 / 1”</td>
</tr>
<tr>
<td>- DN 32 / 1¼”</td>
</tr>
<tr>
<td>- DN 50 / 2”</td>
</tr>
</tbody>
</table>
| The zero error specified for the process connection should be considered as a guideline for a standard design. We will produce a detailed system calculation on request. Systems with reduced remote seal errors are available on request.

**Rated conditions**

<table>
<thead>
<tr>
<th>Installation conditions</th>
<th>Any, vertical as standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient conditions</td>
<td>-10 ... +70 °C (14 ... 158 °F)</td>
</tr>
<tr>
<td>Storage temperature</td>
<td>-10 ... +90 °C (14 ... 194 °F)</td>
</tr>
<tr>
<td>Process temperature</td>
<td>Max. 200 °C (392 °F), depends on design</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP65, optional IP67</td>
</tr>
<tr>
<td>Electromagnetic compatibility</td>
<td></td>
</tr>
<tr>
<td>- Emitted interference</td>
<td>To EN 50081 Part 1, issue 1993 (residential and industrial areas). The unit has no own emissions.</td>
</tr>
<tr>
<td>- Interference immunity to</td>
<td>EN 50082 Part 2, issue March 1995 (industrial areas)</td>
</tr>
</tbody>
</table>

**Design**

<table>
<thead>
<tr>
<th>Weight (without remote seal)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field housing</td>
</tr>
<tr>
<td>Housing with plug</td>
</tr>
<tr>
<td>Material: Stainless steel, mat. No. 1.4404/1.4305</td>
</tr>
<tr>
<td>Material of union nut: Polyamide (with electrical connection using plug or cable)</td>
</tr>
<tr>
<td>Electronics unit potted with silicone</td>
</tr>
<tr>
<td>Internal ventilation for measuring ranges &lt; 16 bar (&lt; 232 psi), through housing thread or connection cable depending on design</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Process connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field housing IP65 or IP67, with screwed gland</td>
</tr>
<tr>
<td>Angled plug DIN 43650, IP65</td>
</tr>
<tr>
<td>Cable connection, IP67</td>
</tr>
<tr>
<td>Round plug connector M12, IP68</td>
</tr>
</tbody>
</table>

**Power supply**

<table>
<thead>
<tr>
<th>Terminal voltage on transmitter</th>
<th>10 ... 30 V DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated voltage</td>
<td>24 V DC</td>
</tr>
</tbody>
</table>

**Certificate and approvals**

Classification according to pressure equipment directive (DRGL 97/23/EC) For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 3, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord

Explosion protection

- Intrinsic safety "i" TÜV 03 ATEX 2099 X
- Identification Ex II 2G EEx ib IIC T6
### Selection and Ordering data

**SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front**

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Ord. code</th>
</tr>
</thead>
<tbody>
<tr>
<td>7MF010</td>
<td>-</td>
</tr>
</tbody>
</table>

**2-wire system**
- Process temperature up to 140 °C (284 °F)
- Accuracy: 0.2% of full-scale value
- Output 4 ... 20 mA

**Diaphragm seal with quick-release clamp**
- Milk pipe union to DIN 11851 with slotted union nut
  - DN 25
  - DN 32
  - DN 40
  - DN 50
  - DN 65

**Milk pipe union to DIN 11851 with threaded socket**
- DN 25
- DN 32
- DN 40
- DN 50
- DN 65

**Clamp connection to DIN 32676**
- DN 25
- DN 40
- DN 50

**Clamp connection to ISO 2852**
- 1 inch
- 1½ inch
- 2 inch
- 2½ inch

**IDF standard with slotted union nut**
- 1 inch
- 1½ inch
- 2 inch

**SMS standard with slotted union nut**
- 1 inch
- 1½ inch
- 2 inch

**DRD flange, without welding-type flange**
- DN 50, PN 40

**Varivent connection (Tuchenhagen)**
- D = 50, for Varivent housing DN 25 and 1 inch
- D = 68, for Varivent housing DN 40 ... DN 125 and 1½ ... 6 inch

**Special version (add Order code and plain text)**

### Filling liquid

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Vegetable oil</td>
</tr>
<tr>
<td>2</td>
<td>Medicinal white oil</td>
</tr>
<tr>
<td>3</td>
<td>Food oil, FDA-listed</td>
</tr>
</tbody>
</table>

### Output signal

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4 ... 20 mA</td>
</tr>
<tr>
<td>9</td>
<td>Special version</td>
</tr>
</tbody>
</table>
Selection and Ordering data

SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front
2-wire system
Process temperature up to 140 °C (284 °F)
Accuracy: 0.2% of full-scale value
Output 4 ... 20 mA

Order No. Ord. code

Order code

Selection and Ordering data

SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front
2-wire system
Process temperature up to 140 °C (284 °F)
Accuracy: 0.2% of full-scale value
Output 4 ... 20 mA

Measured range Overload pressure
(continued)
-1 ... 0 bar g 10 bar g FA
(-14.5 ... 0 psi g) (145 psi g) F
-1 ... 0.6 bar g 10 bar g FB
(-14.5 ... 8.7 psi g) (145 psi g) F
-1 ... 1.5 bar g 16 bar g FC
(-14.5 ... 21.8 psi g) (232 psi g) F
-1 ... 3 bar g 16 bar g FD
(-14.5 ... 43.5 psi g) (232 psi g) F
-1 ... 5 bar g 30 bar g FE
(-14.5 ... 72.5 psi g) (435 psi g) F
-1 ... 9 bar g 30 bar g GA
(-14.5 ... 130.5 psi g) (435 psi g) F
-1 ... 15 bar g 50 bar g GB
(-14.5 ... 217.6 psi g) (725 psi g) F
0 ... 1 bar a 10 bar a HA
(0 ... 14.5 psi a) (145 psi a) H
0 ... 1.6 bar a 10 bar a HB
(0 ... 23.2 psi a) (145 psi a) H
0 ... 2.5 bar a 16 bar a HC
(0 ... 36.3 psi a) (232 psi a) F
0 ... 4 bar a 16 bar a HD
(0 ... 58 psi a) (232 psi a) F
0 ... 6 bar a 30 bar a HE
(0 ... 87 psi a) (435 psi a) F
0 ... 10 bar a 30 bar a JA
(0 ... 145 psi a) (435 psi a) F
Special version (add Order code and plain text)
ZAP 1 Y

Explosion protection
without 1
with, to ATEX 100a, II 2 G, EEx ib IIC T6 2

Further designs

Please add "-Z" to Order No. and specify Order code

Hygiene version
Roughness of process connection:
Foils Ra < 0.8 µm (3.15·10⁻⁸ inch);
Welded seams Ra < 1.5 µm (5.9·10⁻⁸ inch)

Order code

P01

Integral cooling element
Process temperature max. 200 °C (392 °F) instead of 140 °C (284 °F)

Connections for pipe
Pipes to DIN 11850
ISO pipes to DIN 2463
Pipes to O. D. Tubing "BS 4825 Part 1"

Certificates
Use of FDA-listed remote seal filling liquids certified by factory certificate to EN 10204-2.2
Roughness depth measurement Ra certified by factory certificate to EN 10204-3.1
Certification to EHEDG for clamp-on seals with aseptic screwed gland to DIN 11864

F) Subject to export regulations AL: 9I999, ECCN: N.
SITRANS P measuring instruments for pressure
Transmitters for food, pharmaceuticals and biotechnology

SITRANS P Compact
for gage and absolute pressure

### Selection and Ordering data

<table>
<thead>
<tr>
<th>SITRANS P Compact pressure transmitters for pressure and absolute pressure with clamp-on remote seal</th>
<th>Order No.</th>
<th>Ord. code</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-wire system</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Process temperature up to 140 °C (284 °F)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy: 0.2% of full-scale value</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output 4 ... 20 mA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Clamp-on remote seal (screwed gland at both ends) with quick-release clamps

Milk pipe union to DIN 11851 with threaded socket

- DN 25
- DN 32
- DN 40
- DN 50
- DN 65

Clamp connection to DIN 32676

- DN 25
- DN 32
- DN 40
- DN 50
- DN 65

Clamp connection to ISO 28521

- 1 inch
- 1 ½ inch
- 2 inch
- 2 ½ inch

Special version (add Order code and plain text)

### Filling liquid

- Vegetable oil
- Medicinal white oil
- Food oil, FDA-listed

Special version (add Order code and plain text)

### Output signal

- 4 ... 20 mA
- Special version (add Order code and plain text)

---

1) Please note the internal diameter of the pipe. Please specify pipe classes (see “Further designs”)

---

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### Selection and Ordering data

<table>
<thead>
<tr>
<th>Measured range</th>
<th>Overload pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ... 160 mbar g (0 ... 2.32 psi g)</td>
<td>2 bar g (29 psi g)</td>
</tr>
<tr>
<td>0 ... 250 mbar g (0 ... 3.63 psi g)</td>
<td>2 bar g (29 psi g)</td>
</tr>
<tr>
<td>0 ... 400 mbar g (0 ... 5.8 psi g)</td>
<td>6 bar g (87 psi g)</td>
</tr>
<tr>
<td>0 ... 600 mbar g (0 ... 8.7 psi g)</td>
<td>6 bar g (87 psi g)</td>
</tr>
<tr>
<td>0 ... 1 bar g (0 ... 14.5 psi g)</td>
<td>10 bar g (145 psi g)</td>
</tr>
<tr>
<td>0 ... 1.6 bar g (0 ... 23.2 psi g)</td>
<td>10 bar g (145 psi g)</td>
</tr>
<tr>
<td>0 ... 2.5 bar g (0 ... 36.3 psi g)</td>
<td>16 bar g (232 psi g)</td>
</tr>
<tr>
<td>0 ... 4 bar g (0 ... 58 psi g)</td>
<td>16 bar g (232 psi g)</td>
</tr>
<tr>
<td>0 ... 6 bar g (0 ... 87 psi g)</td>
<td>30 bar g (435 psi g)</td>
</tr>
<tr>
<td>0 ... 10 bar g (0 ... 145 psi g)</td>
<td>30 bar g (435 psi g)</td>
</tr>
<tr>
<td>0 ... 16 bar g (0 ... 232 psi g)</td>
<td>50 bar g (725 psi g)</td>
</tr>
<tr>
<td>0 ... 25 bar g (0 ... 363 psi g)</td>
<td>50 bar g (725 psi g)</td>
</tr>
<tr>
<td>0 ... 40 bar g (0 ... 580 psi g)</td>
<td>70 bar g (1015 psi g)</td>
</tr>
<tr>
<td>-160 ... 0 mbar g (-2.32 ... 0 psi g)</td>
<td>2 bar g (29 psi g)</td>
</tr>
<tr>
<td>-250 ... 0 mbar g (-3.63 ... 0 psi g)</td>
<td>2 bar g (29 psi g)</td>
</tr>
<tr>
<td>-400 ... 0 mbar g (-5.8 psi g)</td>
<td>6 bar g (87 psi g)</td>
</tr>
<tr>
<td>-600 ... 0 mbar g (-8.7 ... 0 psi g)</td>
<td>6 bar g (87 psi g)</td>
</tr>
</tbody>
</table>

### Measured range (continued)

<table>
<thead>
<tr>
<th>Measured range</th>
<th>Overload pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 ... 1 bar a (0 ... 14.5 psi a)</td>
<td>10 bar a (145 psi a)</td>
</tr>
<tr>
<td>0 ... 1.6 bar a (0 ... 23.2 psi a)</td>
<td>10 bar a (145 psi a)</td>
</tr>
<tr>
<td>0 ... 2.5 bar a (0 ... 36.3 psi a)</td>
<td>16 bar a (232 psi a)</td>
</tr>
<tr>
<td>0 ... 4 bar a (0 ... 58 psi a)</td>
<td>16 bar a (232 psi a)</td>
</tr>
<tr>
<td>0 ... 6 bar a (0 ... 87 psi a)</td>
<td>30 bar a (435 psi a)</td>
</tr>
<tr>
<td>0 ... 10 bar a (0 ... 145 psi a)</td>
<td>30 bar a (435 psi a)</td>
</tr>
<tr>
<td>Special version (add Order code and plain text)</td>
<td></td>
</tr>
</tbody>
</table>

### Explosion protection

- without: 1
- with, to ATEX 100a, II 2 G, EEx ib IIC T6: 2

### Further designs

- Please add "-Z" to Order No. and specify Order code

### Hygiene version

- Roughness of process connection: Foil Ra < 0.8 µm (3.15·10⁻⁸ inch);
- Welded seams Ra < 1.5 µm (5.9·10⁻⁶ inch)

### Integral cooling element

- Process temperature max. 200 °C (392 °F) instead of 140 °C (284 °F)

### Connections for pipe

- Pipes to DIN 11850
- ISO pipes to ISO 2463
- Pipes to O. D. Tubing "BS 4825 Part 1"

### Certificates

- Use of FDA-listed remote seal filling liquids certified by factory certificate to EN 10204-2.2
- Roughness depth measurement Ra certified by factory certificate to EN 10204-3.1
- Certification to EHEDG for clamp-on seals with aseptic screwed gland to DIN 11864

F) Subject to export regulations AL: 9I999, ECCN: N.
SITRANS P measuring instruments for pressure
Transmitters for food, pharmaceuticals and biotechnology

SITRANS P Compact
for gage and absolute pressure

Dimensional drawings

Housing
Fieldhousing stainless steel Degree of protection IP65 IP67 as alternative

For cable diam. 4.5 ... 10 (0.18 ... 0.39)
For cable diam. 4 ... 10 (0.18 ... 0.39)

Angled plug to DIN 43 650 Degree of protection IP67

Round plug with screw connection M12 Degree of protection IP65

Cable connection Degree of protection IP67 (cable ventilation)

Process connections
Standard

Pipe-screwed gland (food) to DIN 32 676 DN 25 ... 65

Pipe clamp connection to DIN 32 676 DN 25 ... 100 to ISO 2833 1" ... 2½"

Food screwed gland Union nut to DIN 11 851 DN 25 ... 65

Clamp connection to DIN 32 676 ISO 2862 DN 25 ... 65 1" ... 2½"

Pipe-screwed gland (aseptic) Round thread Neumo, Südmo, Guth DN 25 ... 50 1" ... 2"

Pipe clamp connection Neumo, Südmo, Guth DN 25 ... 65 1" ... 2½"

Aseptic

Pipe-screwed gland (aseptic) Round thread Neumo, Südmo, Guth DN 25 ... 50 1" ... 2"

Pipe clamp connection Neumo, Südmo, Guth DN 25 ... 65 1" ... 2½"

Aseptic screwed gland Round thread Neumo, Südmo, Guth DN 25 ... 65 1" ... 2"

Clamp connection Neumo, Südmo, Guth DN 25 ... 65 1" ... 2½"

SITRANS P dimensions in mm (inch)

Schematics

Field housing

Angled plug

Cable connection

Round plug

SITRANS P Compact, connection diagram