

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III Technical description

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Overview



SITRANS P DS III pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameterization is performed using control keys or via HART, PROFIBUS-PA or FOUNDATION Fieldbus interface.

Extensive functionality enables the pressure transmitter to be precisely adapted to the plant's requirements. Operation is very simple in spite of the numerous setting options.

Transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

Various versions of the DS III pressure transmitters are available for measuring:

- Gauge pressure
- Absolute pressure
- Differential pressure
- Level
- Volume level
- Mass level
- volume flow
- Mass flow

Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions
- Separate replacement of measuring cell and electronics without recalibration
- Minimum conformity error
- Good long-term stability
- Wetted parts made of high-grade materials (e.g. stainless steel, Hastelloy, gold, Monel, tantalum)

- Infinitely adjustable span from 0.01 bar to 700 bar (0.15 psi to 10153 psi) for DS III with HART interface
- Nominal measuring range from 1 bar to 700 bar (14.5 psi to 10153 psi) for DS III with PROFIBUS PA and FOUNDATION Fieldbus interface
- High measuring accuracy
- Parameterization over control keys and HART or PROFIBUS PA, or FOUNDATION Fieldbus interface.

Application

The pressure transmitters of the DS III series, can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes the DS III pressure transmitters suitable for locations with high electromagnetic emissions.

Pressure transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The pressure transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

The pressure transmitter can be programmed locally using the 3 control buttons or externally via HART or PROFIBUS PA or FOUNDATION Fieldbus interface.

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Pressure transmitter for gauge pressure

Measured variable: Gauge pressure of aggressive and non-aggressive gases, vapors and liquids.

Span (infinitely adjustable)

for DS III with HART: 0.01 bar to 700 bar (0.15 psi to 10153 psi)

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:
1 bar to 700 bar (14.5 psi to 10153 psi)

Pressure transmitters for absolute pressure

Measured variable: Absolute pressure of aggressive and non-aggressive gases, vapors and liquids.

Span (infinitely adjustable)

for DS III with HART: 8.3 mbar a ... 100 bar a (0.12 ... 1450 psia)

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:
250 mbar a ... 100 bar a (3.6 ... 1450 psia)

There are two series:

- Gauge pressure series
- Differential pressure series

Pressure transmitters for differential pressure and flow

Measured variables:

- Differential pressure
- Small positive or negative pressure
- Flow $q \sim \sqrt{\Delta p}$ (together with a primary differential pressure device (see Chapter "Flow Meters"))

Span (infinitely adjustable)

for DS III with HART: 1 mbar ... 30 bar (0.0145 ... 435 psi)

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:
20 mbar ... 30 bar (0.29 ... 435 psi)

Pressure transmitters for level

Measured variable: Level of aggressive and non-aggressive liquids in open and closed vessels.

Span (infinitely adjustable)

for DS III with HART: 25 mbar ... 5 bar (0.363 ... 72.5 psi)

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:
250 mbar ... 5 bar (3.63 ... 72.5 psi)

Nominal diameter of the mounting flange

- DN 80 or DN 100
- 3 inch or 4 inch

In the case of level measurements in open containers, the low-pressure connection of the measuring cell remains open (measurement "compared to atmospheric").

In the case of measurements in closed containers, the lower-pressure connection has to be connected to the container in order to compensate the static pressure.

The wetted parts are made from a variety of materials, depending on the degree of corrosion resistance required.

Design



Front view

The transmitter consists of various components depending on the order. The possible versions are listed in the ordering information. The components described below are the same for all transmitters.

The rating plate (7, Figure "Front view") with the Article No. is located on the side of the housing. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

The approval label is located on the opposite side.

The housing is made of die-cast aluminium or stainless steel precision casting. A round cover (6) is screwed on at the front and rear of the housing. The front cover can be fitted with a viewing pane so that the measured values can be read directly on the display. The inlet (8) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the housing.

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the housing contains the measuring cell with process connection (5). The measuring cell is prevented from rotating by a locking screw (4). As the result of this modular design, the measuring cell and the electronics can be replaced separately from each other. The set parameter data are retained.

At the top of the housing is a plastic cover (1), which hides the input keys.

Example for an attached measuring point label

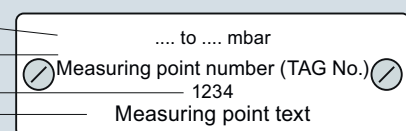
Y01 or Y02

= max. 27 char.

Y15 = max. 16 char.

Y99 = max. 10 char.

Y16 = max. 27 char.



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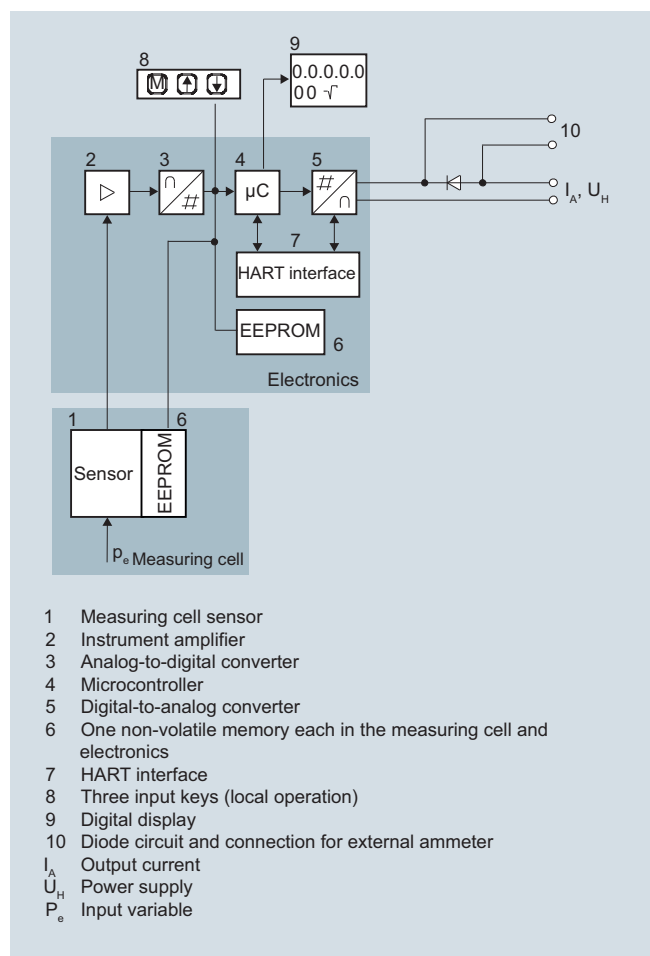
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Function

Operation of electronics with HART communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and converted in a digital-to-analog converter (5) into an output current of 4 to 20 mA.

The diode circuit (10) protects against incorrect polarity.

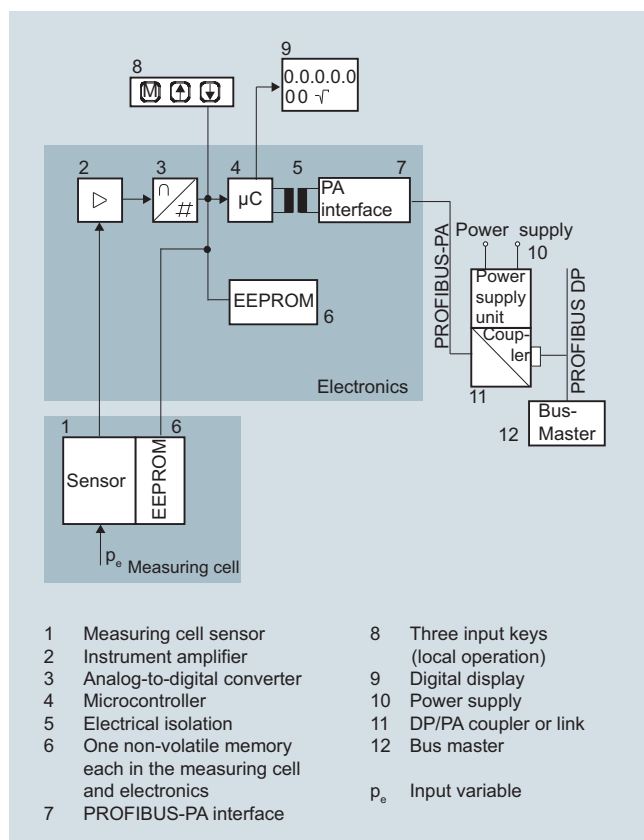
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the 3 input keys (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The HART modem (7) permits parameterization using a protocol according to the HART specification.

The pressure transmitters with spans ≤ 63 bar measure the input pressure compared to atmosphere, transmitters with spans ≥ 160 bar compared to vacuum.

Operation of electronics with PROFIBUS PA communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the PROFIBUS PA through an electrically isolated PA interface (7).

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the PROFIBUS PA. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as SIMATIC PDM is required for this.

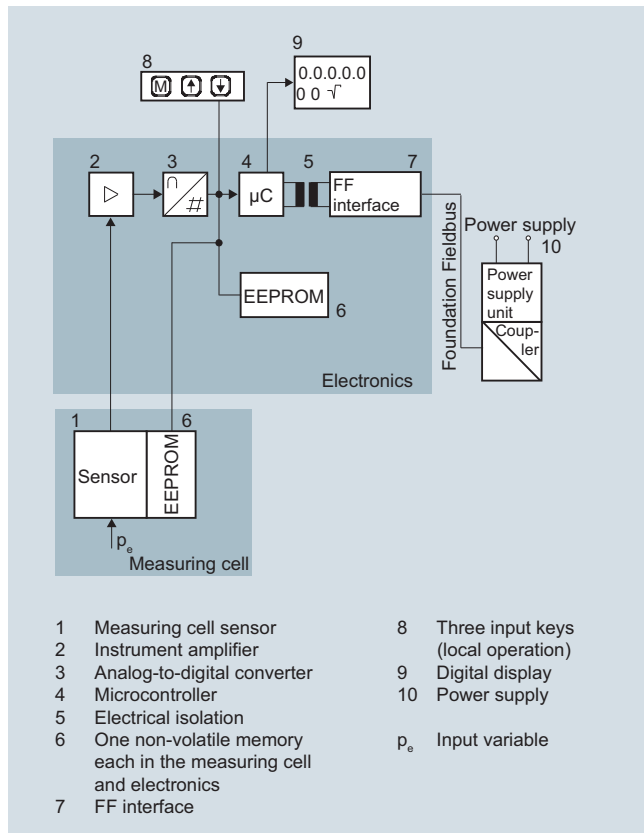
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Operation of electronics with FOUNDATION Fieldbus communication



Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the FOUNDATION Fieldbus through an electrically isolated FOUNDATION Fieldbus interface (7).

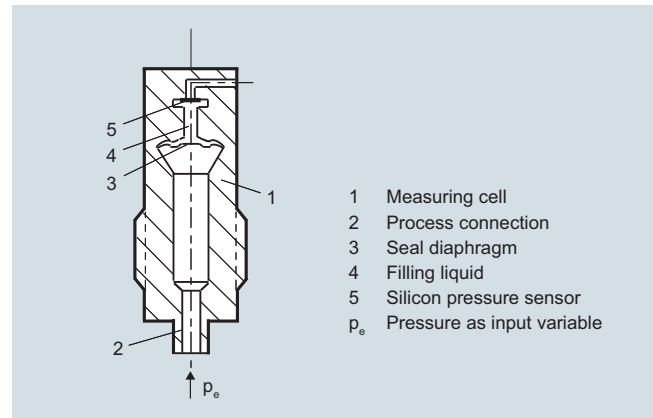
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

Mode of operation of the measuring cells

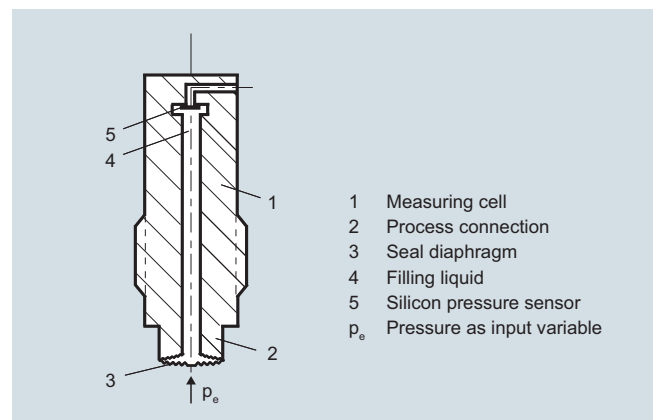
Measuring cell for gauge pressure



Measuring cell for gauge pressure, function diagram

The pressure p_e is applied through the process connection (2, Figure "Measuring cell for gauge pressure, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

Measuring cell for gauge pressure with front-flush diaphragm



Measuring cell for gauge pressure, with front-flush diaphragm for paper industry, function diagram

The pressure p_e is applied through the process connection (2, Figure "Measuring cell for gauge pressure, with front-flush diaphragm for paper industry, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

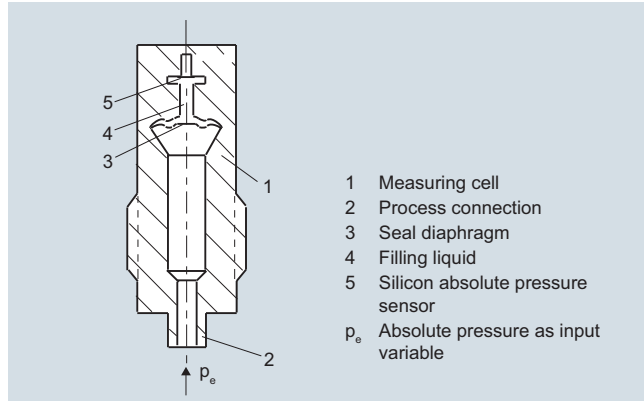
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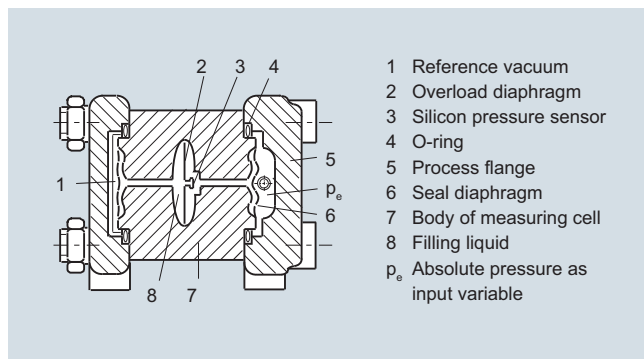
Measuring cell for absolute pressure from gauge pressure series



Measuring cell for absolute pressure from the pressure series, function diagram

The absolute pressure p_e is transmitted through the seal diaphragm (3, Figure "Measuring cell for absolute pressure from pressure series, gauge pressure, function diagram") and the filling liquid (4) to the silicon absolute pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

Measuring cell for absolute pressure from differential pressure series



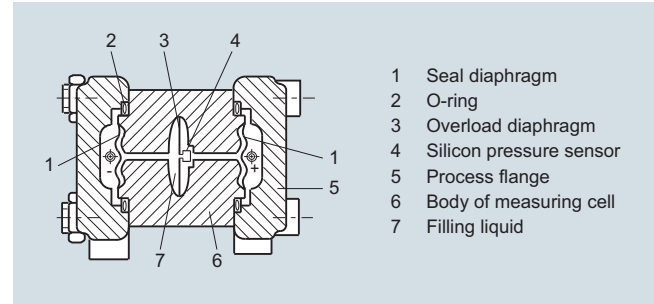
Measuring cell for absolute pressure from differential pressure series, function diagram

The input pressure p_e is transmitted through the seal diaphragm (6, Figure "Measuring cell for absolute pressure from differential pressure series, function diagram") and the filling liquid (8) to the silicon pressure sensor (3).

The difference in pressure between the input pressure p_e and the reference vacuum (1) on the low-pressure side of the measuring cell flexes the measuring diaphragm. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (2) is flexed until the seal diaphragm rests on the body of the measuring cell (7), thus protecting the silicon pressure sensor from overloads.

Measuring cell for differential pressure and flow



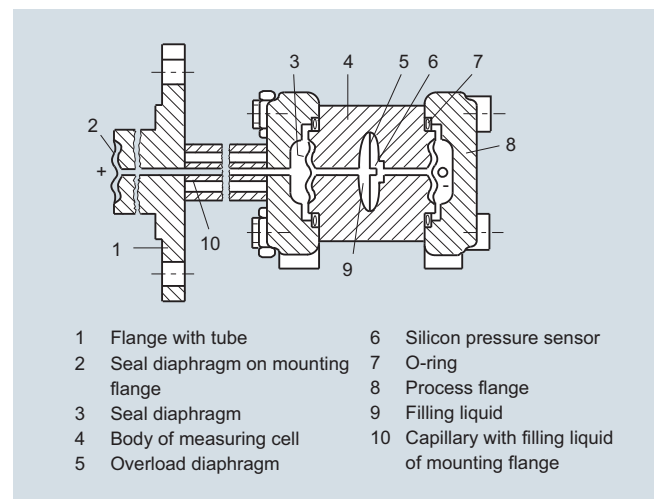
Measuring cell for differential pressure and flow, function diagram

The differential pressure is transmitted through the seal diaphragms (1, Figure "Measuring cell for differential pressure and flow, function diagram") and the filling liquid (7) to the silicon pressure sensor (4).

The measuring diaphragm is flexed by the applied differential pressure. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (3) is flexed until the seal diaphragm rests on the body of the measuring cell (6), thus protecting the silicon pressure sensor from overloads.

Measuring cell for level



Measuring cell for level, function diagram

The input pressure (hydrostatic pressure) acts hydraulically on the measuring cell through the seal diaphragm on the mounting flange (2, Figure "Measuring cell for level, function diagram"). This differential pressure is subsequently transmitted further through the measuring cell (3) and the filling liquid (9) to the silicon pressure sensor (6) whose measuring diaphragm is then flexed.

This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit.

This change in resistance results in a bridge output voltage proportional to the differential pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (5) is flexed until the seal diaphragm rests on the body of the measuring cell (4), thus protecting the silicon pressure sensor from overloads.

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Parameterization DS III

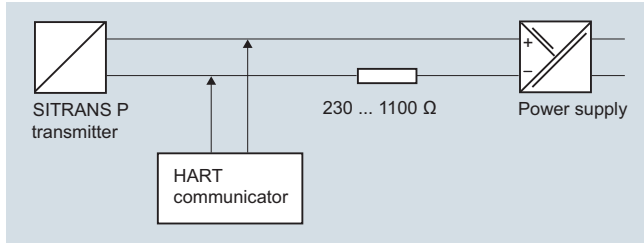
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

With the input buttons you can easily set the most important parameters without any additional equipment.

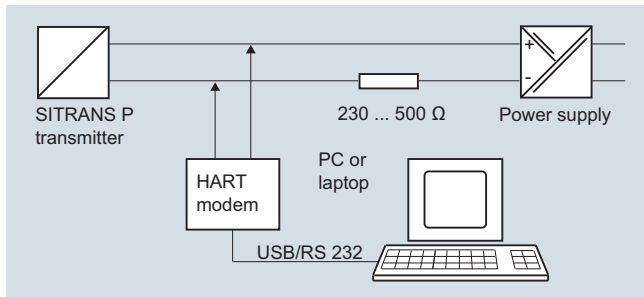
Parameterization using HART

Parameterization using HART is performed with a HART Communicator or a PC.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

Adjustable parameters, DS III with HART

| Parameters | Input keys (DS III HART) | HART communication |
|--|--------------------------|--------------------|
| Start of scale | x | x |
| Full-scale value | x | x |
| Electrical damping | x | x |
| Start-of-scale value without application of a pressure ("Blind setting") | x | x |
| Full-scale value without application of a pressure ("Blind setting") | x | x |
| Zero adjustment | x | x |
| current transmitter | x | x |
| Fault current | x | x |
| Disabling of buttons, write protection | x | x ¹⁾ |
| Type of dimension and actual dimension | x | x |
| Characteristic (linear / square-rooted) | x ²⁾ | x ²⁾ |
| Input of characteristic | | x |
| Freely-programmable LCD | | x |
| Diagnostic functions | | x |

1) Cancel apart from write protection
2) Only differential pressure

Diagnostic functions for DS III with HART

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

Available physical units of display for DS III with HART

Table style: Technical specifications 2

| Physical variable | Physical dimensions |
|--|---|
| Pressure (setting can also be made in the factory) | Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm ² , kg/cm ² , inH ₂ O, inH ₂ O (4 °C), mmH ₂ O, ftH ₂ O (20 °C), inHg, mmHg |
| Level (height data) | m, cm, mm, ft, in |
| Volume | m ³ , dm ³ , hl, yd ³ , ft ³ , in ³ , US gallon, Imp. gallon, bushel, barrel, barrel liquid |
| Mass | g, kg, t, lb, Ston, Lton, oz |
| volume flow | m ³ /d, m ³ /h, m ³ /s, l/min, l/s, ft ³ /d, ft ³ /min, ft ³ /s, US gallon/min, US gallon/s |
| Mass flow | t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/d, g/h, g/min, g/s, lb/d, lb/h, lb/min, lb/s, LTon/d, LTon/h, STon/d, STon/h, STon/min |
| Temperature | K, °C, °F, °R |
| Miscellaneous | %, mA |

Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. Through the PROFIBUS the DS III with PROFIBUS PA is connected to a process control system, e. g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the DS III with FOUNDATION Fieldbus is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

Adjustable parameters for DS III with PROFIBUS PA and FOUNDATION Fieldbus

| Parameters | Input keys | PROFIBUS PA and FOUNDATION Fieldbus interface |
|--|------------|---|
| Electrical damping | x | x |
| Zero adjustment (correction of position) | x | x |
| Buttons and/or function disabling | x | x |
| Source of measured-value display | x | x |
| Physical dimension of display | x | x |
| Position of decimal point | x | x |
| Bus address | x | x |
| Adjustment of characteristic | x | x |
| Input of characteristic | | x |
| Freely-programmable LCD | | x |
| Diagnostics functions | | x |

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Diagnostic functions for DS III with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

Physical dimensions available for the display

| Physical variable | Physical dimensions |
|--|--|
| Pressure (setting can also be made in the factory) | MPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm ² , kg/cm ² , mmH ₂ O, mmH ₂ O (4 °C), inH ₂ O, inH ₂ O (4 °C), ftH ₂ O (20 °C), mmHg, inHg |
| Level (height data) | m, cm, mm, ft, in, yd |
| Volume | m ³ , dm ³ , hl, yd ³ , ft ³ , in ³ , US gallon, Imp. gallon, bushel, barrel, barrel liquid |
| volume flow | m ³ /s, m ³ /min, m ³ /h, m ³ /d, l/s, l/min, l/h, l/d, Ml/d, ft ³ /s, ft ³ /min, ft ³ /h, ft ³ /d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d |
| Mass flow | g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d |
| Total mass flow | t, kg, g, lb, oz, LTon, STon |
| Temperature | K, °C, °F, °R |
| Miscellaneous | % |

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 for gauge pressure

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Technical specifications

| SITRANS P, DS III series for gauge pressure | | | | |
|---|--|--------------------------|--|--------------------------|
| | HART | | PROFIBUS PA and FOUNDATION Fieldbus | |
| Input | Gauge pressure | | | |
| Measured variable | | | | |
| Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure | Span (min. ... max.) | Max. perm. test pressure | Nominal measuring range | Max. perm. test pressure |
| | 0.01 ... 1 bar (0.15 ... 14.5 psi) | 6 bar (87 psi) | 1 bar (14.5 psi) | 6 bar (87 psi) |
| | 0.04 ... 4 bar (0.58 ... 58 psi) | 10 bar (145 psi) | 4 bar (58 psi) | 10 bar (145 psi) |
| | 0.16 ... 16 bar (2.32 ... 232 psi) | 32 bar (464 psi) | 16 bar (232 psi) | 32 bar (464 psi) |
| | 0.6 ... 63 bar (9.14 ... 914 psi) | 100 bar (1450 psi) | 63 bar (914 psi) | 100 bar (1450 psi) |
| | 1.6 ... 160 bar (23.2 ... 2320 psi) | 250 bar (3626 psi) | 160 bar (2320 psi) | 250 bar (3626 psi) |
| | 4.0 ... 400 bar (58 ... 5802 psi) | 600 bar (8700 psi) | 400 bar (5802 psi) | 600 bar (8700 psi) |
| | 7.0 ... 700 bar (102 ... 10153 psi) | 800 bar (11603 psi) | 700 bar (10153 psi) | 800 bar (11603 psi) |
| Lower measuring limit | | | | |
| • Measuring cell with silicone oil filling | 30 mbar a (0.44 psia) | | | |
| • Measuring cell with inert filling liquid | 30 mbar a (0.44 psia) | | | |
| Upper measuring limit | 100 % of max. span (for oxygen version and inert filling liquid; max. 120 bar (1740 psi)) | | | |
| Output | | | | |
| Output signal | 4 ... 20 mA | | Digital PROFIBUS PA and FOUNDATION Fieldbus signal | |
| • Lower limit (infinitely adjustable) | 3.55 mA, factory preset to 3.84 mA | | - | |
| • Upper limit (infinitely adjustable) | 23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA | | - | |
| Load | | | | |
| • Without HART | $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V | | - | |
| • With HART | $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator) | | - | |
| Physical bus | - | | IEC 61158-2 | |
| Protection against polarity reversal | Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage. | | | |
| Electrical damping (step width 0.1 s) | | | Set to 2 s (0 ... 100 s) | |
| Measuring accuracy | Acc. to IEC 60770-1 | | | |
| Reference conditions (All error data refer always refer to the set span) | Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span / set span) | | | |
| Error in measurement at limit setting incl. hysteresis and reproducibility | | | | |
| • Linear characteristic | | | ≤ 0.075 % | |
| - r ≤ 10 | ≤ (0.0029 · r + 0.071) % | | | |
| - 10 < r ≤ 30 | ≤ (0.0045 · r + 0.071) % | | | |
| - 30 < r ≤ 100 | ≤ (0.005 · r + 0.05) % | | | |
| Long-term stability (temperature change ± 30 °C (± 54 °F)) | | | | |
| • 1 ... 4-bar measuring cell | ≤ (0.25 · r) % per 5 years | | ≤ 0.25 % per 5 years | |
| • 16 ... 700-bar measuring cell | ≤ (0.125 · r) % per 5 years | | ≤ 0.125 % per 5 years | |
| Influence of ambient temperature | | | | |
| • at -10 ... +60 °C (14 ... 140 °F) | ≤ (0.08 · r + 0.1) % ¹⁾ (at 700 bar: ≤ (0.1 · r + 0.2) % ²⁾ | | ≤ 0.3 % | |
| • at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F) | ≤ (0.1 · r + 0.15) %/10 K | | ≤ 0.25 %/10 K | |
| Measured Value Resolution | - | | 3 · 10 ⁻⁵ of nominal measuring range | |

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SITRANS P DS III for gauge pressure

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| SITRANS P, DS III series for gauge pressure | | HART | PROFIBUS PA and FOUNDATION Fieldbus |
|---|---|------|--|
| Rated conditions | | | |
| Degree of protection (to EN 60529) | | | IP65 (optional IP65/IP68) |
| Temperature of medium | | | |
| • Measuring cell with silicone oil filling | | | -40 ... +100 °C (-40 ... +212 °F) |
| • Measuring cell with inert filling liquid | | | -20 ... +100 °C (-4 ... +212 °F) |
| • In conjunction with dust explosion protection | | | -20 ... +60 °C (-4 ... +140 °F) |
| Ambient conditions | | | |
| • Ambient temperature | | | |
| - Transmitter (with 4-wire connection, observe temperature values of supplementary 4-wire electronics) | | | -40 ... +85 °C (-40 ... +185 °F) |
| - Display readable | | | -30 ... +85 °C (-22 ... +185 °F) |
| • Storage temperature | | | -50 ... +85 °C (-58 ... +185 °F) |
| • Climatic class | | | |
| - Condensation | | | Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics |
| • Electromagnetic Compatibility | | | |
| - Emitted interference and interference immunity | | | Acc. to IEC 61326 and NAMUR NE 21 |
| Design | | | |
| Weight (without options) | | | ≈ 1.5 kg (≈ 3.3 lb) |
| Enclosure material | | | Low-copper die-cast aluminum, GD-AISI 12 or stainless steel precision casting, mat. no. 1.4408 |
| Wetted parts materials | | | |
| • Connection shank | | | Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4610 |
| • Oval flange | | | Stainless steel, mat. no. 1.4404/316L |
| • Seal diaphragm | | | Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819 |
| Measuring cell filling | | | Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F)) |
| Process connection | | | Connection shank G½B to DIN EN 837-1, female thread ½ -14 NPT or oval flange (PN 160 (MAWP 2320 psi)) to DIN 19213 with mounting thread M10 or 7/16-20 UNF to EN 61518 |
| Material of mounting bracket | | | |
| Steel | | | Sheet-steel, Mat. No. 1.0330, chrome-plated |
| Stainless steel | | | Sheet stainless steel, mat. no. 1.4301 (SS 304) |
| Power supply U_H | | | Supplied through bus |
| Terminal voltage on transmitter | 10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode | | - |
| Separate 24 V power supply necessary | - | | No |
| Bus voltage | | | |
| • Not Ex | - | | 9 ... 32 V |
| • With intrinsically-safe operation | - | | 9 ... 24 V |
| Current consumption | | | |
| • Basic current (max.) | - | | 12.5 mA |
| • Start-up current ≤ basic current | - | | Yes |
| • Max. current in event of fault | - | | 15.5 mA |
| Fault disconnection electronics (FDE) available | - | | Yes |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
for gauge pressure

1

SITRANS P, DS III series for gauge pressure

| | HART | PROFIBUS PA and FOUNDATION Fieldbus |
|---|--|--|
| Certificates and approvals | | |
| Classification according to PED 97/23/EC | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) | |
| Explosion protection | | |
| • Intrinsic safety "i" | | PTB 13 ATEX 2007 X |
| - Marking | | Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb |
| - Permissible ambient temperature | | -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6 |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$ | FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 174 \text{ mA}$, $P_o = 1 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Explosion-proof "d" | | PTB 99 ATEX 1160 |
| - Marking | | Ex II 1/2 G Ex d IIC T4/T6 Gb |
| - Permissible ambient temperature | | -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6 |
| - Connection | To circuits with values: $U_{H1} = 10.5 \dots 45 \text{ V DC}$ | To circuits with values: $U_{H1} = 9 \dots 32 \text{ V DC}$ |
| • Dust explosion protection for zone 20 | | PTB 01 ATEX 2055 |
| - Marking | | Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C |
| - Permissible ambient temperature | | -40 ... +85 °C (-40 ... +185 °F) |
| - Max. surface temperature | | 120 °C (248 °F) |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$ | FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Dust explosion protection for zone 21/22 | | PTB 01 ATEX 2055 |
| - Marking | | Ex II 2 D IP65 T 120 °C |
| - Connection | To circuits with values: $U_{H1} = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$ | To circuits with values: $U_{H1} = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$ |
| • Type of protection "n" (zone 2) | | PTB 13 ATEX 2007 X |
| - Marking | | Ex II 2/3 G Ex nA II T4/T5/T6 Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gc |
| - Connection (Ex nA) | $U_m = 45 \text{ V}$ | $U_m = 32 \text{ V}$ |
| - Connections (Ex ic) | To circuits with values: $U_i = 45 \text{ V}$ | FISCO supply unit ic: $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Explosion protection acc. to FM | | Certificate of Compliance 3008490 |
| - Identification (XP/DIP) or (IS); (NI) | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III | |
| • Explosion protection to CSA | | Certificate of Compliance 1153651 |
| - Identification (XP/DIP) or (IS) | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III | |

1) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.064 · r + 0.08) % / 28 °C (50 °F).

2) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.08 · r + 0.16) % / 28 °C (50 °F).

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge pressure

1

| HART communication | | FOUNDATION Fieldbus communication | |
|---|--|--|---|
| HART | 230 ... 1100 Ω | Function blocks | 3 function blocks analog input, 1 function block PID |
| Protocol | HART Version 5.x | • Analog input | Yes, linearly rising or falling characteristic |
| Software for computer | SIMATIC PDM | - Adaptation to customer-specific process variables | 0 ... 100 s |
| PROFIBUS PA communication | | - Electrical damping, adjustable | Output/input (can be locked within the device with a bridge) |
| Simultaneous communication with master class 2 (max.) | 4 | - Simulation function | parameterizable (last good value, substitute value, incorrect value) |
| The address can be set using | Configuration tool or local operation (standard setting address 126) | - Failure mode | Yes, one upper and lower warning limit and one alarm limit respectively |
| Cyclic data usage | | - Limit monitoring | Yes |
| • Output byte | 5 (one measured value) or 10 (two measured values) | - Square-rooted characteristic for flow measurement | |
| • Input byte | 0, 1, or 2 (register operating mode and reset function for metering) | • PID | Standard FOUNDATION Fieldbus function block |
| Internal preprocessing | | • Physical block | 1 resource block |
| Device profile | PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B | Transducer blocks | 1 transducer block Pressure with calibration, 1 transducer block LCD |
| Function blocks | 2 | • Pressure transducer block | |
| • Analog input | | - Can be calibrated by applying two pressures | Yes |
| - Adaptation to customer-specific process variables | Yes, linearly rising or falling characteristic | - Monitoring of sensor limits | Yes |
| - Electrical damping, adjustable | 0 ... 100 s | - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function |
| - Simulation function | Input /Output parameterizable (last good value, substitute value, incorrect value) | | |
| - Failure mode | Yes, one upper and lower warning limit and one alarm limit respectively | | |
| - Limit monitoring | Can be reset, preset, optional direction of counting, simulation function of register output | | |
| • Register (totalizer) | | | |
| - Failure mode | parameterizable (summation with last good value, continuous summation, summation with incorrect value) | | |
| - Limit monitoring | One upper and lower warning limit and one alarm limit respectively | | |
| • Physical block | 1 | | |
| Transducer blocks | 2 | | |
| • Pressure transducer block | | | |
| - Can be calibrated by applying two pressures | Yes | | |
| - Monitoring of sensor limits | Yes | | |
| - Specification of a container characteristic with | Max. 30 nodes | | |
| - Square-rooted characteristic for flow measurement | Yes | | |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable | | |
| - Simulation function for measured pressure value and sensor temperature | Constant value or over parameterizable ramp function | | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
 for gauge pressure

1

| Selection and Ordering data | | Article No. |
|--|------------------------------------|-----------------|
| Pressure transmitter for gauge pressure, SITRANS P DS III with HART | | 7MF4033- |
| Measuring cell filling | Measuring cell cleaning | |
| Silicone oil | normal | ▶ ◆ 1 |
| Inert liquid ¹⁾ | grease-free to cleanliness level 2 | ▶ ◆ 3 |
| Measuring span (min. ... max.) | | |
| 0.01 ... 1 bar | (0.15 ... 14.5 psi) | ▶ ◆ B |
| 0.04 ... 4 bar | (0.58 ... 58 psi) | ▶ ◆ C |
| 0.16 ... 16 bar | (2.32 ... 232 psi) | ▶ ◆ D |
| 0.63 ... 63 bar | (9.14 ... 914 psi) | ▶ ◆ E |
| 1.6 ... 160 bar | (23.2 ... 2320 psi) | ▶ ◆ F |
| 4.0 ... 400 bar | (58.0 ... 5802 psi) | ▶ ◆ G |
| 7.0 ... 700 bar | (102.0 ... 10153 psi) | ▶ ◆ J |
| Wetted parts materials | | |
| Seal diaphragm | Process connection | |
| Stainless steel | Stainless steel | ▶ ◆ A |
| Hastelloy | Stainless steel | B |
| Hastelloy | Hastelloy | C |
| Version as diaphragm seal ^{2) 3) 4) 5)} | | Y |
| Process connection | | |
| • Connection shank G $\frac{1}{2}$ B to EN 837-1 | | ▶ ◆ 0 |
| • Female thread $\frac{1}{2}$ -14 NPT | | ◆ 1 |
| • Stainless steel oval flange with process connection (Oval flange has no female thread) | | |
| - Mounting thread $\frac{7}{16}$ -20 UNF to IEC 61518 | | 2 |
| - Mounting thread M10 to DIN 19213 | | 3 |
| - Mounting thread M12 to DIN 19213 | | 4 |
| • Male thread M20 x 1.5 | | 5 |
| • Male thread $\frac{1}{2}$ -14 NPT | | 6 |
| Non-wetted parts materials | | |
| • Housing made of die-cast aluminium | | ▶ ◆ 0 |
| • Housing stainless steel precision casting ⁶⁾ | | 3 |
| Version | | |
| • Standard versions | | ◆ 1 |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | | ▶ ◆ 2 |
| Explosion protection | | |
| • None | | ◆ A |
| • With ATEX, Type of protection: | | |
| - "Intrinsic safety (Ex ia)" | | ◆ B |
| - "Explosion-proof (Ex d) ⁷⁾ | | ◆ D |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) ⁸⁾ | | ◆ P |
| - "Ex nA/ic (Zone 2) ⁹⁾ | | ◆ E |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D) ⁸⁾ | | ▶ ◆ R |
| • FM + CSA intrinsic safe (is) | | F |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | | S |
| • With FM + CSA, Type of protection: | | |
| - "Intrinsic Safe und Explosion Proof (is + xp) ⁷⁾ | | ◆ NC |
| Electrical connection / cable entry | | |
| • Screwed gland Pg 13.5 (adapter) ¹⁰⁾ | | A |
| • Screwed gland M20 x 1.5 | | ▶ ◆ B |
| • Screwed gland $\frac{1}{2}$ -14 NPT | | ◆ C |
| • Han 7D plug (plastic housing) incl. mating connector ¹⁰⁾ | | D |
| • M12 connectors (stainless steel) ¹⁰⁾¹¹⁾ | | F |

| Selection and Ordering data | | Article No. |
|---|--|-----------------|
| Pressure transmitter for gauge pressure, SITRANS P DS III with HART | | 7MF4033- |
| Display | | |
| • Without display | | ◆ 0 |
| • Without visible display (display concealed, setting: mA) | | ▶ ◆ 1 |
| • With visible display, setting: mA | | ◆ 6 |
| • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required) | | ◆ 7 |

▶ Available ex stock

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

- 1) For oxygen application, add Order code E10.
- 2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 3) If the acceptance test certificate 3.1. is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 4) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-...Y-... and 7MF4900-1...-B
- 5) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
- 6) Not in conjunction with Electrical connection "Screwed gland Pg 13.5" and "Han7D plug".
- 7) Without cable gland, with blanking plug
- 8) With enclosed cable gland Ex ia and blanking plug
- 9) Configurations with HAN and M12 connectors are only available in Ex ic.
- 10) Not in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof".
- 11) M12 delivered without cable socket

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge pressure

1

| Selection and Ordering data | | Article No. |
|---|------------------------------------|-----------------------|
| Pressure transmitter for gauge pressure | | |
| SITRANS P DS III with PROFIBUS PA (PA) | | 7MF4034- |
| SITRANS P DS III with FOUNDATION Fieldbus (FF) | | 7MF4035- |
| | | ■ ■ ■ ■ ■ - ■ ■ ■ ■ ■ |
| Measuring cell filling | Measuring cell cleaning | |
| Silicone oil | normal | 1 |
| Inert liquid ¹⁾ | grease-free to cleanliness level 2 | 3 |
| Nominal measuring range | | |
| 1 bar | (14.5 psi) | B |
| 4 bar | (58 psi) | C |
| 16 bar | (232 psi) | D |
| 63 bar | (914 psi) | E |
| 160 bar | (2320 psi) | F |
| 400 bar | (5802 psi) | G |
| 700 bar | (10153 psi) | J |
| Wetted parts materials | | |
| Seal diaphragm | Process connection | |
| Stainless steel | Stainless steel | A |
| Hastelloy | Stainless steel | B |
| Hastelloy | Hastelloy | C |
| Version as diaphragm seal ^{2) 3) 4) 5)} | | Y |
| Process connection | | |
| • Connection shank G½B to EN 837-1 | | 0 |
| • Female thread ½-14 NPT | | 1 |
| • Stainless steel oval flange with process connection (Oval flange has no female thread) ⁶⁾ | | |
| - Mounting thread 7/16-20 UNF to IEC 61518 | | 2 |
| - Mounting thread M10 to DIN 19213 | | 3 |
| - Mounting thread M12 to DIN 19213 | | 4 |
| • Male thread M20 x 1.5 | | 5 |
| • Male thread ½-14 NPT | | 6 |
| Non-wetted parts materials | | |
| • Housing made of die-cast aluminium | | 0 |
| • Housing stainless steel precision casting | | 3 |
| Version | | |
| • Standard versions | | 1 |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | | 2 |
| Explosion protection | | |
| • None | | A |
| • With ATEX, Type of protection: | | |
| - "Intrinsic safety (Ex ia)" | | B |
| - "Explosion-proof (Ex d)" ⁷⁾ | | D |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) ⁸⁾ | | P |
| - "Ex nA/ic (Zone 2)" ⁹⁾ | | E |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" ⁸⁾ (not for DS III FF) | | R |
| • FM + CSA intrinsic safe (is) | | F |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | | S |
| • With FM + CSA, Type of protection: | | |
| - "Intrinsic Safe und Explosion Proof (is + xp)" ⁷⁾ | | NC |
| Electrical connection/cable entry | | |
| • Screwed gland M20 x 1.5 | | B |
| • Screwed gland ½-14 NPT | | C |
| • M12 connectors (stainless steel) ^{10) 11) 12)} | | F |

| Selection and Ordering data | | Article No. |
|--|--|-----------------------|
| Pressure transmitter for gauge pressure | | |
| SITRANS P DS III with PROFIBUS PA (PA) | | 7MF4034- |
| SITRANS P DS III with FOUNDATION Fieldbus (FF) | | 7MF4035- |
| | | ■ ■ ■ ■ ■ - ■ ■ ■ ■ ■ |
| Display | | |
| • Without display | | 0 |
| • Without visible display (display concealed, setting: bar) | | 1 |
| • With visible display | | 6 |
| • with customer-specific display (setting as specified, Order code "Y21" required) | | 7 |
| Included in delivery of the device: | | |
| • Brief instructions (Leporello) | | |
| • CD-ROM with detailed documentation | | |
| 1) For oxygen application, add Order code E10. | | |
| 2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. | | |
| 3) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. | | |
| 4) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-.-.Y.-.-... and 7MF4900-1...-B | | |
| 5) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil. | | |
| 6) M10 fastening thread: Max. span 160 bar (2320 psi) 7/16-20 UNF and M12 fastening thread: Max. span 400 bar (5802 psi) | | |
| 7) Without cable gland, with blanking plug. | | |
| 8) With enclosed cable gland Ex ia and blanking plug. | | |
| 9) Configurations with HAN and M12 connectors are only available in Ex ic. | | |
| 10) M12 delivered without cable socket | | |
| 11) Not available with protection type "Ex d" Bestellbar (Options D, P, N and R) | | |
| 12) Not with protection types "Explosion-proof" and protection type „Ex nA“, „Intrinsic safe“ and „Explosion proof“. | | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
 for gauge pressure

1

| Selection and Ordering data | Order code | | |
|---|-------------------|----|----|
| <i>Further designs</i> | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code. | | | |
| Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of: | | | |
| • Steel | ◆ A01 | ✓ | ✓ |
| • Stainless steel | ◆ A02 | ✓ | ✓ |
| Plug | | | |
| • Han 7D (metal, gray) | A30 | ✓ | |
| • Han 8U (instead of Han 7D) | A31 | ✓ | |
| • Angled | A32 | ✓ | |
| • Han 8D (metal, gray) | A33 | ✓ | |
| Cable sockets for M12 connectors (stainless steel) | A50 | ✓ | ✓ |
| Rating plate inscription (instead of German) | | | |
| • English | ◆ B11 | ✓ | ✓ |
| • French | ◆ B12 | ✓ | ✓ |
| • Spanish | ◆ B13 | ✓ | ✓ |
| • Italian | ◆ B14 | ✓ | ✓ |
| English rating plate | ◆ B21 | ✓ | ✓ |
| Pressure units in inH ₂ O and/or psi | | | |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2¹⁾ | ◆ C11 | ✓ | ✓ |
| Inspection certificate²⁾ | ◆ C12 | ✓ | ✓ |
| Acc. to EN 10204-3.1 | | | |
| Factory certificate | ◆ C14 | ✓ | ✓ |
| Acc. to EN 10204-2.2 | | | |
| Functional safety (SIL2) | ◆ C20 | ✓ | |
| Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | | | |
| Functional safety (PROFIsafe) Certificate and PROFIsafe protocol | C21 ³⁾ | ✓ | |
| Functional safety (SIL2/3) | ◆ C23 | ✓ | |
| Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | | | |
| Device passport Russia | C99 | ✓ | ✓ |
| (For price request please contact the technical support www.siemens.com/automation/support-request) | | | |
| Setting of upper limit of output signal to 22.0 mA | D05 | ✓ | |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) | D07 | ✓ | ✓ |
| Degree of protection IP65/IP68 (only for M20x1.5 and ½-14 NPT) | D12 | ✓ | ✓ |
| Supplied with oval flange (1 item), PTFE packing and screws in thread of oval flange | D37 | ✓ | ✓ |
| Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia ⁴⁾) | E01 | ✓ | ✓ |
| Oxygen application (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F)) | E10 | ✓ | ✓ |
| Export approval Korea | E11 | ✓ | ✓ |
| CRN approval Canada (Canadian Registration Number) | E22 | ✓ | ✓ |
| Dual seal | E24 | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..) | E25 ⁴⁾ | ✓ | ✓ |

| Selection and Ordering data | Order code | | |
|--|-------------------|----|----|
| <i>Further designs</i> | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code. | | | |
| "Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..) | E26 ⁴⁾ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..) | E28 ⁴⁾ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..) | E45 ⁴⁾ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex id) (only for transmitter 7MF4...-.....-D..) | E46 ⁴⁾ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" to NEPSI (China) | E55 ⁴⁾ | ✓ | ✓ |
| Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..) | E56 ⁴⁾ | ✓ | ✓ |
| Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..) | E57 ⁴⁾ | ✓ | ✓ |
| "Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11) | E70 ⁴⁾ | ✓ | ✓ |
| Two coats of lacquer on casing and cover (PU on epoxy) | G10 | ✓ | ✓ |
| Transient protector 6 kV (lightning protection) | J01 | ✓ | ✓ |

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

¹⁾ When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

²⁾ If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

³⁾ Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

⁴⁾ Option does not include ATEX approval, but instead includes only the country-specific approval.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge pressure

1

| Selection and Ordering data | Order code | | | |
|--|-------------|------|-----------------|----|
| Additional data | | HART | PA | FF |
| Please add "-Z" to Article No. and specify Order code(s) and plain text. | | | | |
| Measuring range to be set Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi | ◆ Y01 | ✓ | ✓ ¹⁾ | |
| Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15: | ◆ Y15 | ✓ | ✓ | ✓ |
| Measuring point text (entry in device variable) Max. 27 characters, specify in plain text: Y16: | ◆ Y16 | ✓ | ✓ | ✓ |
| Entry of HART address (TAG) Max. 8 characters, specify in plain text: Y17: | ◆ Y17 | ✓ | | |
| Setting of pressure indication in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ^{*)} , inH ₂ O ^{*)} , ftH ₂ O ^{*)} , mmHg, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or %) ref. temperature 20 °C | ◆ Y21 | ✓ | ✓ | ✓ |
| Setting of pressure indication in non-pressure units²⁾ Specify in plain text: Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters) | ◆ Y22 + Y01 | ✓ | | |
| Preset bus address possible between 1 and 126 Specify in plain text: Y25: | Y25 | | ✓ | ✓ |
| Damping adjustment in seconds (0 ... 100 s) | Y30 | ✓ | ✓ | ✓ |

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

Ordering example

Item line: 7MF4033-1EA00-1AA7-Z
B line: A01 + Y01 + Y21
C line: Y01: 10 ... 20 bar (145 ... 290 psi)
C line: Y21: bar (psi)

¹⁾ Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

²⁾ Preset values can only be changed over SIMATIC PDM.

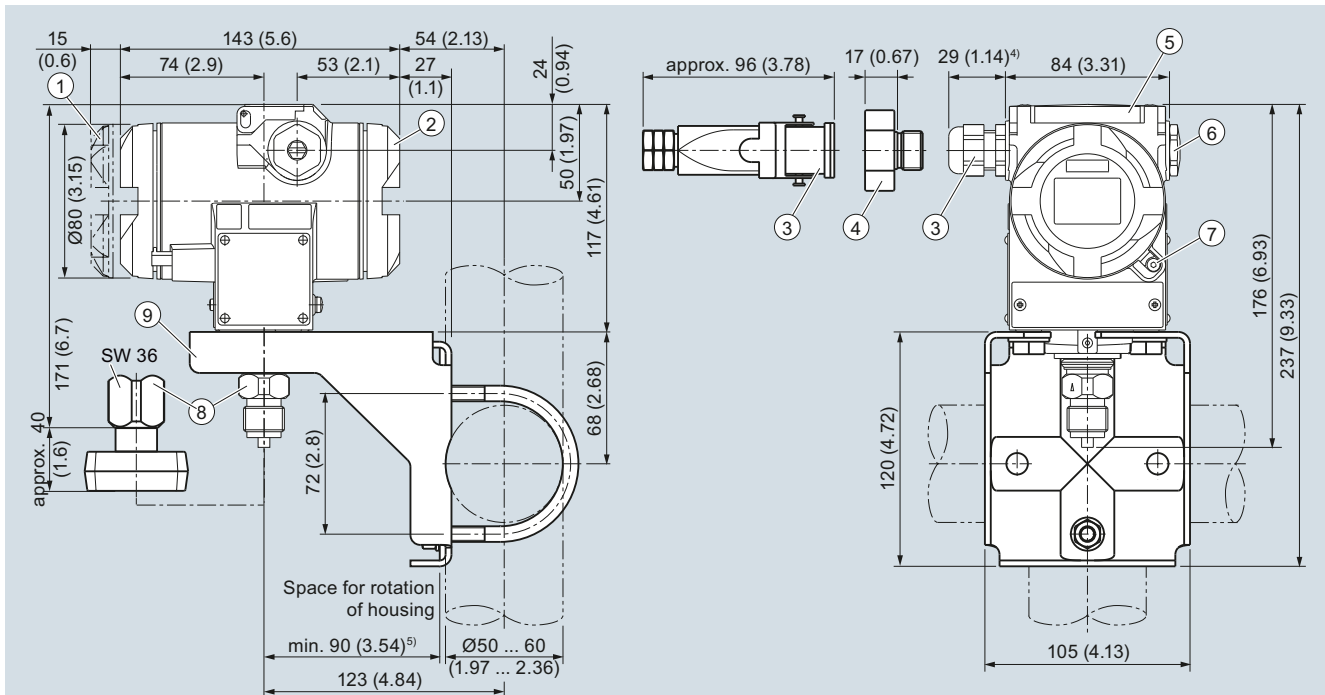
Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
for gauge pressure

1

Dimensional drawings



- ① Electronic side, digital display
(longer overall length for cover with window)¹⁾
- ② Terminal side¹⁾
- ③ Electrical connection:
Screwed gland Pg 13,5 (adapter)(Adapter)^{2) 3)},
Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or
Han 7D/Han 8D^{2) 3)} plug
- ④ Harting adapter
- ⑤ Protective cover over keys
- ⑥ Blanking plug
- ⑦ Screw cover - safety bracket (only for type of protection
"Explosion-proof enclosure", not shown in the drawing)
- ⑧ Process connection: Connection shank G½B or Oval flange
- ⑨ Mounting bracket (option)

- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "Explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA" [IS + XP]"
- 4) For Pg 13,5 with adapter approx. 45 mm (1.77 inch)
- 5) Minimum distance for rotating

SITRANS P DS III pressure transmitters for gauge pressure, dimensions in mm (inch)

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

1

Technical specifications

| SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm | | | | |
|---|---|--------------------------------|--|--------------------------------|
| | HART | | PROFIBUS PA and FOUNDATION Fieldbus | |
| Input of gauge pressure, with front-flush diaphragm | | | | |
| Measured variable | Gauge pressure, front-flush | | | |
| Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure | Span (min. ... max.) | Max. perm. test pressure | Nominal measuring range | Max. perm. test pressure |
| | 0.01 ... 1 bar (0.15 ... 14.5 psi) | 6 bar (87 psi) | 1 bar (14.5 psi) | 6 bar (87 psi) |
| | 0.04 ... 4 bar (0.58 ... 58 psi) | 10 bar (145 psi) | 4 bar (58 psi) | 10 bar (145 psi) |
| | 0.16 ... 16 bar (2.32 ... 232 psi) | 32 bar (464 psi) | 16 bar (232 psi) | 32 bar (464 psi) |
| | 0.6 ... 63 bar (9.14 ... 914 psi) | 100 bar (1450 psi) | 63 bar (914 psi) | 100 bar (1450 psi) |
| Lower measuring limit | 100 mbar a (1.45 psia) | | | |
| Upper measuring limit | 100 % of max. span | | 100 % of the max. nominal measuring range | |
| Input of absolute pressure, with front-flush diaphragm | | | | |
| Measured variable | Absolute pressure, front-flush | | | |
| Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure | Span (min. ... max.) | Max. perm. test pressure | Nominal measuring range | Max. perm. test pressure |
| | 43 ... 1300 mbar a (0.62 ... 18.85 psia) | 10 bar a (145 psia) | 1300 mbar a (18.85 psia) | 10 bar a (145 psia) |
| | 0.16 ... 5 bar a (2.32 ... 72.5 psia) | 30 bar a (435 psia) | 5 bar a (72.5 psia) | 30 bar a (435 psia) |
| | 1 ... 30 bar a (14.5 ... 435 psia) | 100 bar a (1450 psia) | 30 bar a (435 psia) | 100 bar a (1450 psia) |
| Lower measuring limit | 0 bar a (0 psia) | | | |
| Upper measuring limit | 100 % of max. span | | 100 % of the max. nominal measuring range | |
| Output | | | | |
| Output signal | 4 ... 20 mA | | Digital PROFIBUS PA and FOUNDATION Fieldbus signal | |
| • Lower limit (infinitely adjustable) | 3.55 mA, factory preset to 3.84 mA | | - | |
| • Upper limit (infinitely adjustable) | 23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA | | - | |
| Load | | | | |
| • Without HART | $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V | | - | |
| • With HART | $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator) | | - | |
| Physical bus | - | | IEC 61158-2 | |
| Protection against polarity reversal | Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage. | | | |
| Electrical damping (step width 0.1 s) | Set to 2 s (0 ... 100 s) | | | |
| Measuring accuracy | | | | |
| Acc. to IEC 60770-1 | | | | |
| Reference conditions (All error data refer always to the set span) | Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span / set span) | | | |
| Error in measurement at limit setting incl. hysteresis and reproducibility | Gauge pressure, front-flush | Absolute pressure, front-flush | Gauge pressure, front-flush | Absolute pressure, front-flush |
| • Linear characteristic | | | $\leq 0.075 \%$ | $\leq 0.2 \%$ |
| - r ≤ 10 | $\leq (0.0029 \cdot r + 0.071) \%$ | $\leq 0.2 \%$ | | |
| - 10 < r ≤ 30 | $\leq (0.0045 \cdot r + 0.071) \%$ | $\leq 0.4 \%$ | | |
| - 30 < r ≤ 100 | $\leq (0.005 \cdot r + 0.05) \%$ | | | |
| Long-term stability (temperature change $\pm 30 \text{ °C}$ ($\pm 54 \text{ °F}$)) | $\leq (0.25 \cdot r) \%$ per 5 years | | $\leq 0.25 \%$ per 5 years | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure,
with front-flush diaphragm

1

| SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm | HART | | PROFIBUS PA and FOUNDATION Fieldbus | |
|---|--|--|-------------------------------------|--------------------------------|
| | Gauge pressure, front-flush | Absolute pressure, front-flush | Gauge pressure, front-flush | Absolute pressure, front-flush |
| Influence of ambient temperature | | | | |
| • at -10 ... +60 °C (14 ... 140 °F) | $\leq (0.1 \cdot r + 0.2) \%^{1)}$ | $\leq (0.2 \cdot r + 0.3) \%$ | $\leq 0.3 \%$ | $\leq 0.5 \%$ |
| • at -40 ... -10 °C and 60 ... 85 °C (-40 ... +14 °F and 140 ... 185 °F) | $\leq (0.1 \cdot r + 0.15) \%/10 \text{ K}$ | $\leq (0.2 \cdot r + 0.3) \%/10 \text{ K}$ | $\leq 0.25 \%/10 \text{ K}$ | $\leq 0.5 \%/10 \text{ K}$ |
| Influence of mounting position | 0.1 mbar (0.04 inH ₂ O) per 10° inclination | | | |
| Measured Value Resolution | 3 · 10 ⁻⁵ of nominal measuring range | | | |
| Influence of the medium temperature | | | | |
| • Temperature difference between medium temperature and ambient temperature | 3 mbar/10 K (0.04 psi/10 K) | | | |
| Rated conditions | | | | |
| <u>Installation conditions</u> | | | | |
| Ambient temperature | Observe the temperature class in areas subject to explosion hazard. | | | |
| • Measuring cell with silicone oil | -40 ... +85 °C (-40 ... +185 °F) | | | |
| • Measuring cell with Neobee oil (with front-flush diaphragm) | -10 ... +85 °C (14 ... +185 °F) | | | |
| • Measuring cell with inert liquid (not with front-flush diaphragm) | -20 ... +85 °C (-4 ... +185 °F) | | | |
| • Transmitter (with 4-wire connection, observe temperature values of supplementary 4-wire electronics) | -40 ... +85 °C (-40 ... +185 °F) | | | |
| • Display readable | -30 ... +85 °C (-22 ... +185 °F) | | | |
| • Storage temperature | -50 ... +85 °C (-58 ... +185 °F) (in the case of Neobee: -20 ... +85 °C (-4 ... +185 °F)) (for high temperature oil: -10 ... +85 °C (14 ... 185 °F)) | | | |
| • Climatic class | Relative humidity 0 ... 100 % | | | |
| - Condensation | Condensation permissible, suitable for use in the tropics | | | |
| Degree of protection (to IEC 60529) | IP65, IP68, NEMA 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F) | | | |
| • Electromagnetic Compatibility | Acc. to IEC 61326 and NAMUR NE 21 | | | |
| - Emitted interference and interference immunity | | | | |
| <u>Medium conditions</u> | The max. medium temperature of the front-flush process connections is to be taken into account in accordance with the relevant connection standards (e. g. DIN 32676, DIN 11851 etc.). | | | |
| Temperature of medium | | | | |
| • Measuring cell with silicone oil | -40 ... +100 °C (-40 ... +212 °F) | | | |
| • Measuring cell with silicone oil (with front-flush diaphragm) | -40 ... +150 °C (-40 ... +302 °F) | | | |
| • Measuring cell with Neobee oil (with front-flush diaphragm) | -10 ... +150 °C (14 ... 302 °F) | | | |
| • Measuring cell with silicone oil, with temperature decoupler (only for gauge pressure version with front-flush diaphragm) | -40 ... +200 °C (-40 ... +392 °F) | | | |
| • Measuring cell with inert filling liquid | -20 ... +100 °C (-4 ... +212 °F) | | | |
| • Measuring cell with high-temperature oil (only for gauge pressure version with front-flush diaphragm) | -10 ... +250 °C (14 ... 482 °F) | | | |
| Design | | | | |
| Weight (without options) | ≈ 1.5 kg (≈ 3.3 lb) | | | |
| Enclosure material | Low-copper die-cast aluminum, GD-AISi12 or stainless steel precision casting, mat. no. 1.4408 | | | |
| Wetted parts materials | Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819 | | | |
| Measuring cell filling | Silicone oil or inert filling liquid | | | |
| Process connection | <ul style="list-style-type: none"> • Flanges as per EN and ASME • F&B and pharmaceutical flanges | | | |
| Surface quality touched-by-media | R_a -values $\leq 0.8 \mu\text{m}$ (32 μ -inch)/welds $R_a \leq 1.6 \mu\text{m}$ (64 μ -inch) (Process connections acc. to 3A; R_a -values $\leq 0.8 \mu\text{m}$ (32 μ -inch)/welds $R_a \leq 0.8 \mu\text{m}$ (32 μ -inch)) | | | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

1

| SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm | | |
|---|---|--|
| | HART | PROFIBUS PA and FOUNDATION Fieldbus |
| Power supply U_H | | Supplied through bus |
| Terminal voltage on transmitter | 10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode | - |
| Separate 24 V power supply necessary | - | No |
| Bus voltage | | |
| • Not Ex | - | 9 ... 32 V |
| • With intrinsically-safe operation | - | 9 ... 24 V |
| Current consumption | | |
| • Basic current (max.) | - | 12.5 mA |
| • Start-up current \leq basic current | - | Yes |
| • Max. current in event of fault | - | 15.5 mA |
| Fault disconnection electronics (FDE) available | - | Yes |
| Certificates and approvals | | |
| Classification according to PED 97/23/EC | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) | |
| Explosion protection | | |
| • Intrinsic safety "i" | PTB 13 ATEX 2007 X | |
| - Marking | Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6 | |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30$ V, $I_i = 100$ mA, $P_i = 750$ mW; $R_i = 300$ Ω | FISCO supply unit: $U_o = 17.5$ V, $I_o = 380$ mA, $P_o = 5.32$ W Linear barrier: $U_o = 24$ V, $I_o = 250$ mA, $P_o = 1.2$ W |
| - Effective internal inductance/capacitance | $L_i = 0.4$ mH, $C_i = 6$ nF | $L_i = 7$ μ H, $C_i = 1.1$ nF |
| • Explosion-proof "d" | PTB 99 ATEX 1160 | |
| - Marking | Ex II 1/2 G Ex d IIC T4/T6 Gb | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6 | |
| - Connection | To circuits with values: $U_H = 10.5$... 45 V DC | To circuits with values: $U_H = 9$... 32 V DC |
| • Dust explosion protection for zone 20 | PTB 01 ATEX 2055 | |
| - Marking | Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) | |
| - Max. surface temperature | 120 °C (248 °F) | |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30$ V, $I_i = 100$ mA, $P_i = 750$ mW, $R_i = 300$ Ω | FISCO supply unit: $U_o = 17.5$ V, $I_o = 380$ mA, $P_o = 5.32$ W Linear barrier: $U_o = 24$ V, $I_o = 250$ mA, $P_o = 1$ W |
| - Effective internal inductance/capacitance | $L_i = 0.4$ mH, $C_i = 6$ nF | $L_i = 7$ μ H, $C_i = 1.1$ nF |
| • Dust explosion protection for zone 21/22 | PTB 01 ATEX 2055 | |
| - Marking | Ex II 2 D IP65 T 120 °C | |
| - Connection | To circuits with values: $U_H = 10.5$... 45 V DC; $P_{max} = 1.2$ W | To circuits with values: $U_H = 9$... 32 V DC; $P_{max} = 1$ W |
| • Type of protection "n" (zone 2) | PTB 13 ATEX 2007 X | |
| - Marking | Ex II 2/3 G Ex nA II T4/T5/T6 Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gc | |
| - Connection (Ex nA) | $U_m = 45$ V | $U_m = 32$ V |
| - Connections (Ex ic) | To circuits with values: $U_i = 45$ V | FISCO supply unit ic: $U_o = 17.5$ V, $I_o = 570$ mA Linear barrier: $U_o = 32$ V, $I_o = 132$ mA, $P_o = 1$ W |
| - Effective internal inductance/capacitance | $L_i = 0.4$ mH, $C_i = 6$ nF | $L_i = 7$ μ H, $C_i = 1.1$ nF |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure,
with front-flush diaphragm

1

| SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm | |
|--|---|
| HART | PROFIBUS PA and FOUNDATION Fieldbus |
| Certificates and approvals (continued) | |
| <ul style="list-style-type: none"> Explosion protection acc. to FM <ul style="list-style-type: none"> Identification (XP/DIP) or (IS); (NI) Explosion protection to CSA <ul style="list-style-type: none"> Identification (XP/DIP) or (IS) | <p>Certificate of Compliance 3008490</p> <p>CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III</p> <p>Certificate of Compliance 1153651</p> <p>CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III</p> |

¹⁾ Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.064 . r + 0.08) % / 28 °C (50 °F).

Hygiene version

In the case of SITRANS P DSIII with 7MF413x front-flush diaphragm, selected connections comply with the requirements of EHEDG.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

1

| HART communication | | FOUNDATION Fieldbus communication | |
|---|--|--|---|
| HART | 230 ... 1100 Ω | Function blocks | 3 function blocks analog input, 1 function block PID |
| Protocol | HART Version 5.x | • Analog input | Yes, linearly rising or falling characteristic |
| Software for computer | SIMATIC PDM | - Adaptation to customer-specific process variables | 0 ... 100 s |
| PROFIBUS PA communication | | - Electrical damping, adjustable | Output/input (can be locked within the device with a bridge) |
| Simultaneous communication with master class 2 (max.) | 4 | - Simulation function | parameterizable (last good value, substitute value, incorrect value) |
| The address can be set using | Configuration tool or local operation (standard setting address 126) | - Failure mode | Yes, one upper and lower warning limit and one alarm limit respectively |
| Cyclic data usage | | - Limit monitoring | Yes |
| • Output byte | 5 (one measured value) or 10 (two measured values) | - Square-rooted characteristic for flow measurement | |
| • Input byte | 0, 1, or 2 (register operating mode and reset function for metering) | • PID | Standard FOUNDATION Fieldbus function block |
| Internal preprocessing | | • Physical block | 1 resource block |
| Device profile | PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B | Transducer blocks | 1 transducer block Pressure with calibration, 1 transducer block LCD |
| Function blocks | 2 | • Pressure transducer block | |
| • Analog input | | - Can be calibrated by applying two pressures | Yes |
| - Adaptation to customer-specific process variables | Yes, linearly rising or falling characteristic | - Monitoring of sensor limits | Yes |
| - Electrical damping, adjustable | 0 ... 100 s | - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function |
| - Simulation function | Input /Output parameterizable (last good value, substitute value, incorrect value) | | |
| - Failure mode | | | |
| - Limit monitoring | Yes, one upper and lower warning limit and one alarm limit respectively | | |
| • Register (totalizer) | Can be reset, preset, optional direction of counting, simulation function of register output | | |
| - Failure mode | parameterizable (summation with last good value, continuous summation, summation with incorrect value) | | |
| - Limit monitoring | One upper and lower warning limit and one alarm limit respectively | | |
| • Physical block | 1 | | |
| Transducer blocks | 2 | | |
| • Pressure transducer block | | | |
| - Can be calibrated by applying two pressures | Yes | | |
| - Monitoring of sensor limits | Yes | | |
| - Specification of a container characteristic with | Max. 30 nodes | | |
| - Square-rooted characteristic for flow measurement | Yes | | |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable | | |
| - Simulation function for measured pressure value and sensor temperature | Constant value or over parameterizable ramp function | | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

1

| Selection and Ordering data | | Article No. |
|--|-------------------------------------|-----------------|
| Pressure transmitter for gauge and absolute pressure, front-flush diaphragm, SITRANS P DS III HART | | 7MF4133- |
| Measuring cell filling | Measuring cell cleaning | |
| Silicone oil | normal | 1 |
| Inert liquid | grease-free to cleanliness level 2 | 3 |
| FDA compliant fill fluid | | |
| • Neobee oil | normal | 4 |
| Measuring span (min. ... max.) | | |
| 0.01 ... 1 bar | (0.15 ... 14.5 psi) | B |
| 0.04 ... 4 bar | (0.58 ... 58 psi) | C |
| 0.16 ... 16 bar | (2.32 ... 232 psi) | D |
| 0.63 ... 63 bar | (9.14 ... 914 psi) | E |
| 13 ... 1300 mbar a ¹⁾ | (0.62 ... 18.85 psia) ¹⁾ | S |
| 0.05 ... 5 bar a ¹⁾ | (0.7 ... 72.5 psia) ¹⁾ | T |
| 0.3 ... 30 bar a ¹⁾ | (4.35 ... 435 psia) ¹⁾ | U |
| Wetted parts materials | | |
| Seal diaphragm | Connection shank | |
| Stainless steel | Stainless steel | A |
| Hastelloy ²⁾ | Stainless steel | B |
| Process connection | | |
| • Flange version with Order code M., N., R. or Q.. | | 7 |
| Non-wetted parts materials | | |
| • Housing made of die-cast aluminium | | 0 |
| • Housing stainless steel precision casting | | 3 |
| Version | | |
| • Standard versions | | 1 |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | | 2 |
| Explosion protection | | |
| • None | | A |
| • With ATEX, Type of protection: | | |
| - "Intrinsic safety (Ex ia)" | | B |
| - "Explosion-proof (Ex d)" ³⁾ | | D |
| - „Ex nA/ic (Zone 2)" ⁴⁾ | | E |
| • FM + CSA intrinsic safe (is) | | F |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | | S |
| • With FM + CSA, Type of protection: | | |
| - "Intrinsic Safe und Explosion Proof (is + xp)" ³⁾ | | NC |
| Electrical connection/cable entry | | |
| • Inner thread M20 x 1.5 | | B |
| • Female thread ½-14 NPT | | C |
| • M12 connectors (stainless steel) ^{5) 6) 7)} | | F |
| Display | | |
| • Without display | | 0 |
| • Without visible display (display concealed, setting: mA) | | 1 |
| • with visible display, setting: mA | | 6 |
| • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required) | | 7 |

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

- 1) Not with temperature decoupler P00 and P10, not for process connections R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.
- 2) Only available for flanges with options M., N. and Q..
- 3) Without cable gland, with blanking plug
- 4) Bei Konfiguration mit Stecker HAN und M12 ist nur Zündschutzart Ex ic möglich.
- 5) M12 delivered without cable socket
- 6) Not available with protection type „Ex d“ (options D and N)
- 7) Not with protection types "Explosion-proof" and "Ex nA", „Intrinsic safe" and „Explosion proof“.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

1

| Selection and Ordering data | | Article No. | Selection and Ordering data | | Article No. |
|--|------------------------------------|----------------|--|--|----------------|
| Pressure transmitter P for gauge and absolute pressure, front-flush diaphragm: | | | Pressure transmitter P for gauge and absolute pressure, front-flush diaphragm: | | |
| SITRANS P DS III with PROFIBUS PA (PA) | | 7 MF 4 1 3 4 - | SITRANS P DS III with PROFIBUS PA (PA) | | 7 MF 4 1 3 4 - |
| SITRANS P DS III with FOUNDATION Fieldbus (FF) | | 7 MF 4 1 3 5 - | SITRANS P DS III with FOUNDATION Fieldbus (FF) | | 7 MF 4 1 3 5 - |
| Measuring cell filling | Measuring cell cleaning | | Display | | |
| Silicone oil | normal | 1 | • Without display | | 0 |
| Inert liquid | grease-free to cleanliness level 2 | 3 | • Without visible display (display concealed, setting: bar) | | 1 |
| FDA compliant fill fluid | | | • With visible display | | 6 |
| • Neobee oil | normal | 4 | • With customer-specific display (setting as specified, Order code "Y21" required) | | 7 |
| Nominal measuring range | | | Included in delivery of the device: | | |
| 1 bar | (14.5 psi) | B | • Brief instructions (Leporello) | | |
| 4 bar | (58 psi) | C | • CD-ROM with detailed documentation | | |
| 16 bar | (232 psi) | D | | | |
| 63 bar | (914 psi) | E | 1) Not with temperature decoupler P00 and P10, not for process connections R01, R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil. | | |
| 1300 mbar a ¹⁾ | (18.85 psia) ¹⁾ | S | 2) Only available for flanges with options M..., N... and Q... | | |
| 5 bar a ¹⁾ | (72.5 psia) ¹⁾ | T | 3) Without cable gland, with blanking plug | | |
| 30 bar a ¹⁾ | (435 psia) ¹⁾ | U | 4) Not in conjunction with types of protection "Explosion-proof" and "Ex ic", "Intrinsic safety" and "Explosion-proof". | | |
| Wetted parts materials | | | 5) M12 delivered without cable socket | | |
| Seal diaphragm | Connection shank | | 6) Not available with protection type „Ex d“ (optionen D and N) | | |
| Stainless steel | Stainless steel | A | 7) Not with protection types "Explosion-proof" and "Ex nA", „Intrinsic safe“ and „Explosion proof“. | | |
| Hastelloy ²⁾ | Stainless steel | B | | | |
| Process connection | | | | | |
| • Flange version with Order code M..., N..., R.. or Q.. | | 7 | | | |
| Non-wetted parts materials | | | | | |
| • Housing made of die-cast aluminium | | 0 | | | |
| • Housing stainless steel precision casting | | 3 | | | |
| Version | | | | | |
| • Standard versions | | 1 | | | |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | | 2 | | | |
| Explosion protection | | | | | |
| • None | | A | | | |
| • With ATEX, Type of protection: | | | | | |
| - "Intrinsic safety (Ex ia)" | | B | | | |
| - "Explosion-proof (Ex d)" ³⁾ | | D | | | |
| • FM + CSA intrinsic safe (is) | | F | | | |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | | S | | | |
| • With FM + CSA, Type of protection: | | | | | |
| - "Intrinsic Safe und Explosion Proof (is + xp)" ³⁾ (Available soon) | | NC | | | |
| Electrical connection/cable entry | | | | | |
| • Screwed gland M20 x 1.5 | | B | | | |
| • Screwed gland ½-14 NPT | | C | | | |
| • Han 7D plug (plastic housing) incl. mating connector ⁴⁾ | | D | | | |
| • M12 connectors (stainless steel) ^{5) 6) 7)} | | F | | | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

1

| Selection and Ordering data | Order code | | |
|--|--------------------------|------------------|------------------|
| <i>Further designs</i> Add "-Z" to Article No. and specify Order code. | HART | PA | FF |
| Plug • Angled • Han 8D (metal, gray) | A32 A33 | ✓ ✓ | ✓ ✓ |
| Cable sockets for M12 connectors (stainless steel) | A50 | ✓ | ✓ |
| Rating plate inscription (instead of German) • English • French • Spanish • Italian | B11 B12 B13 B14 | ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ |
| English rating plate Pressure units in inH ₂ O and/or psi | B21 | ✓ | ✓ |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2 | C11 | ✓ | ✓ |
| Inspection certificate Acc. to EN 10204-3.1 | C12 | ✓ | ✓ |
| Factory certificate Acc. to EN 10204-2.2 | C14 | ✓ | ✓ |
| Functional safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | C20 | ✓ | ✓ |
| Functional safety (PROFIsafe) Certificate and PROFIsafe protocol | C21 ¹⁾ | ✓ | ✓ |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | C23 | ✓ | ✓ |
| Device passport Russia (For price request please contact the technical support www.siemens.com/automation/support-request.) | C99 | ✓ | ✓ |
| Setting of upper limit of output signal to 22.0 mA | D05 | ✓ | ✓ |
| Degree of protection IP65/IP68 (only for M20x1.5 and ½-14 NPT) | D12 | ✓ | ✓ |
| Oxygen application (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F)) | E10 | ✓ | ✓ |
| Export approval Korea | E11 | ✓ | ✓ |
| CRN approval Canada (Canadian Registration Number) | E22 | ✓ | ✓ |
| Dual seal | E24 | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..) | E25 ²⁾ | ✓ | ✓ |
| "Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..) | E26 ²⁾ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..) | E28 ²⁾ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..) | E45 ²⁾ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex id) (only for transmitter 7MF4...-.....-D..) | E46 ²⁾ | ✓ | ✓ |
| "Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]...-Z + E11) | E70 ²⁾ | ✓ | ✓ |

| Selection and Ordering data | Order code | | |
|--|--|--|--|
| <i>Further designs</i> Add "-Z" to Article No. and specify Order code. | HART | PA | FF |
| Two coats of lacquer on casing and cover (PU on epoxy) | G10 | ✓ | ✓ |
| Transient protector 6 kV (lightning protection) | J01 | ✓ | ✓ |
| Flanges to EN 1092-1, Form b1 • DN 25, PN 40 ³⁾ • DN 25, PN 100 ³⁾ • DN 40, PN 40 • DN 40, PN 100 • DN 50, PN 16 • DN 50, PN 40 • DN 80, PN 16 • DN 80, PN 40 | M11 M21 M13 M23 M04 M14 M06 M16 | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ |
| Flanges to ASME B16.5 • Stainless steel flange 1" class 150 ³⁾ • Stainless steel flange 1½" class 150 • Stainless steel flange 2" class 150 • Stainless steel flange 3" class 150 • Stainless steel flange 4" class 150 • Stainless steel flange 1" class 300 ³⁾ • Stainless steel flange 1½" class 300 • Stainless steel flange 2" class 300 • Stainless steel flange 3" class 300 • Stainless steel flange 4" class 300 | M40 M41 M42 M43 M44 M45 M46 M47 M48 M49 | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ | ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ |
| Threaded connector to DIN 3852-2, form A, thread to ISO 228⁴⁾ • G ¼"-A, front-flush • G 1"-A, front-flush • G 2"-A, front-flush | R01 R02 R04 | ✓ ✓ ✓ | ✓ ✓ ✓ |
| Tank connection⁵⁾ Sealing is included in delivery • TG 52/50, PN 40 • TG 52/150, PN 40 | R10 R11 | ✓ ✓ | ✓ ✓ |
| Sanitary process connection according DIN 11851 (Dairy connection with slotted union nut) • DN 50, PN 25 • DN 80, PN 25 | N04 N06 | ✓ ✓ | ✓ ✓ |
| Tri-Clamp connection according DIN 32676/ISO 2852 • DN 50/2", PN 16 • DN 65/3", PN 10 | N14 N15 | ✓ ✓ | ✓ ✓ |
| Varivent connection Certified to EHEDG • Type N = 68 for Varivent housing DN 40 ... 125 und 1½" ... 6", PN 40 | N28 | ✓ | ✓ |
| Temperature decoupler up to 200 °C⁶⁾ for version with front-flush diaphragm | P00 | ✓ | ✓ |
| Temperature decoupler up to 250 °C Measuring cell filling: High-temperature oil, only in conjunction with measuring cell filling silicone oil | P10 | ✓ | ✓ |
| Bio-Control sanitary process connection Certified to EHEDG • DN 50, PN 16 • DN 65, PN 16 | Q53 Q54 | ✓ ✓ | ✓ ✓ |
| Sanitary process connection to DRD • DN 50, PN 40 | M32 | ✓ | ✓ |
| SMS socket with union nut • 2" • 2½" • 3" | M67 M68 M69 | ✓ ✓ ✓ | ✓ ✓ ✓ |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

1

| Selection and Ordering data | Order code | | | Selection and Ordering data | Order code | | |
|---|------------|----|----|---|------------|----|----|
| <i>Further designs</i> Add "-Z" to Article No. and specify Order code. | HART | PA | FF | <i>Further designs</i> Add "-Z" to Article No. and specify Order code. | HART | PA | FF |
| SMS threaded socket | | | | Aseptic threaded socket to DIN 11864-1 Form A | | | |
| • 2" | M73 | ✓ | ✓ | approved according to EHEDG | | | |
| • 2½" | M74 | ✓ | ✓ | • DN 50, PN 25 | N33 | ✓ | ✓ |
| • 3" | M75 | ✓ | ✓ | • DN 65, PN 25 | N34 | ✓ | ✓ |
| IDF socket with union nut ISO 2853 | | | | • DN 80, PN 25 | N35 | ✓ | ✓ |
| • 2" | M82 | ✓ | ✓ | • DN 100, PN 25 | N36 | ✓ | ✓ |
| • 2½" | M83 | ✓ | ✓ | Aseptic flange with notch to DIN 11864-2 Form A | | | |
| • 3" | M84 | ✓ | ✓ | approved according to EHEDG | | | |
| IDF threaded socket ISO 2853 | | | | • DN 50, PN 16 | N43 | ✓ | ✓ |
| • 2" | M92 | ✓ | ✓ | • DN 65, PN 16 | N44 | ✓ | ✓ |
| • 2½" | M93 | ✓ | ✓ | • DN 80, PN 16 | N45 | ✓ | ✓ |
| • 3" | M94 | ✓ | ✓ | • DN 100, PN 16 | N46 | ✓ | ✓ |
| Sanitary process connection to NEUMO Bio-Connect screw connection | | | | Aseptic flange with groove to DIN 11864-2 Form A approved according to EHEDG | | | |
| Certified to EHEDG | | | | • DN 50, PN 16 | N43 + P11 | ✓ | ✓ |
| • DN 50, PN 16 | Q05 | ✓ | ✓ | • DN 65, PN 16 | N44 + P11 | ✓ | ✓ |
| • DN 65, PN 16 | Q06 | ✓ | ✓ | • DN 80, PN 16 | N45 + P11 | ✓ | ✓ |
| • DN 80, PN 16 | Q07 | ✓ | ✓ | • DN 100, PN 16 | N46 + P11 | ✓ | ✓ |
| • DN 100, PN 16 | Q08 | ✓ | ✓ | Aseptic clamp with groove to DIN 11864-3 Form A | | | |
| • DN 2", PN 16 | Q13 | ✓ | ✓ | approved according to EHEDG | | | |
| • DN 2½", PN 16 | Q14 | ✓ | ✓ | • DN 50, PN 25 | N53 | ✓ | ✓ |
| • DN 3", PN 16 | Q15 | ✓ | ✓ | • DN 65, PN 25 | N54 | ✓ | ✓ |
| • DN 4", PN 16 | Q16 | ✓ | ✓ | • DN 80, PN 16 | N55 | ✓ | ✓ |
| Sanitary process connection to NEUMO Bio-Connect flange connection | | | | • DN 100, PN 16 | N56 | ✓ | ✓ |
| Certified to EHEDG | | | | | | | |
| • DN 50, PN 16 | Q23 | ✓ | ✓ | | | | |
| • DN 65, PN 16 | Q24 | ✓ | ✓ | | | | |
| • DN 80, PN 16 | Q25 | ✓ | ✓ | | | | |
| • DN 100, PN 16 | Q26 | ✓ | ✓ | | | | |
| • DN 2", PN 16 | Q31 | ✓ | ✓ | | | | |
| • DN 2½", PN 16 | Q32 | ✓ | ✓ | | | | |
| • DN 3", PN 16 | Q33 | ✓ | ✓ | | | | |
| • DN 4", PN 16 | Q34 | ✓ | ✓ | | | | |
| Sanitary process connection to NEUMO Bio-Connect clamp connection | | | | | | | |
| Certified to EHEDG | | | | | | | |
| • DN 50, PN 16 | Q39 | ✓ | ✓ | | | | |
| • DN 65, PN 10 | Q40 | ✓ | ✓ | | | | |
| • DN 80, PN 10 | Q41 | ✓ | ✓ | | | | |
| • DN 100, PN 10 | Q42 | ✓ | ✓ | | | | |
| • DN 2½", PN 16 | Q48 | ✓ | ✓ | | | | |
| • DN 3", PN 10 | Q49 | ✓ | ✓ | | | | |
| • DN 4", PN 10 | Q50 | ✓ | ✓ | | | | |
| Sanitary process connection to NEUMO Bio-Connect S flange connection | | | | | | | |
| Certified to EHEDG | | | | | | | |
| • DN 50, PN 16 | Q63 | ✓ | ✓ | | | | |
| • DN 65, PN 10 | Q64 | ✓ | ✓ | | | | |
| • DN 80, PN 10 | Q65 | ✓ | ✓ | | | | |
| • DN 100, PN 10 | Q66 | ✓ | ✓ | | | | |
| • DN 2", PN 16 | Q72 | ✓ | ✓ | | | | |
| • DN 2½", PN 10 | Q73 | ✓ | ✓ | | | | |
| • DN 3", PN 10 | Q74 | ✓ | ✓ | | | | |
| • DN 4", PN 10 | Q75 | ✓ | ✓ | | | | |

1) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H.

2) Option does not include ATEX approval, but instead includes only the country-specific approval.

3) Special seal in Viton included in the scope of delivery

4) Lower measuring limit -100 mbar (1.45 psi).

5) The weldable socket can be ordered under accessories.

6) The maximum permissible temperatures of the medium depend on the respective cell fillings.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure,
with front-flush diaphragm

1

| Selection and Ordering data | Order code | | | |
|---|------------------|------|-----------------|----|
| Additional data | | HART | PA | FF |
| Please add "-Z" to Article No. and specify Order code(s) and plain text. | | | | |
| Measuring range to be set Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi | Y01 | ✓ | ✓ ¹⁾ | |
| Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15: | Y15 | ✓ | ✓ | ✓ |
| Measuring point text (entry in device variable) Max. 27 characters, specify in plain text: Y16: | Y16 | ✓ | ✓ | ✓ |
| Entry of HART address (TAG) Max. 8 characters, specify in plain text: Y17: | Y17 | ✓ | | |
| Setting of pressure indicator in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ^{*)} , inH ₂ O ^{*)} , ftH ₂ O ^{*)} , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or % ^{*)} ref. temperature 20 °C | Y21 | ✓ | ✓ | ✓ |
| Setting of pressure indication in non-pressure units²⁾ Specify in plain text: Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters) | Y22 + Y01 | ✓ | | |
| Preset bus address possible between 1 and 126 Specify in plain text: Y25: | Y25 | | ✓ | ✓ |
| Damping adjustment in seconds (0 ... 100 s) | Y30 | ✓ | ✓ | ✓ |

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

ordering example

Item line: 7MF4133-1DB20-1AB7-Z
B line: A22 + Y01 + Y21
C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)
C line: Y21: bar (psi)

¹⁾ Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

²⁾ Preset values can only be changed over SIMATIC PDM.

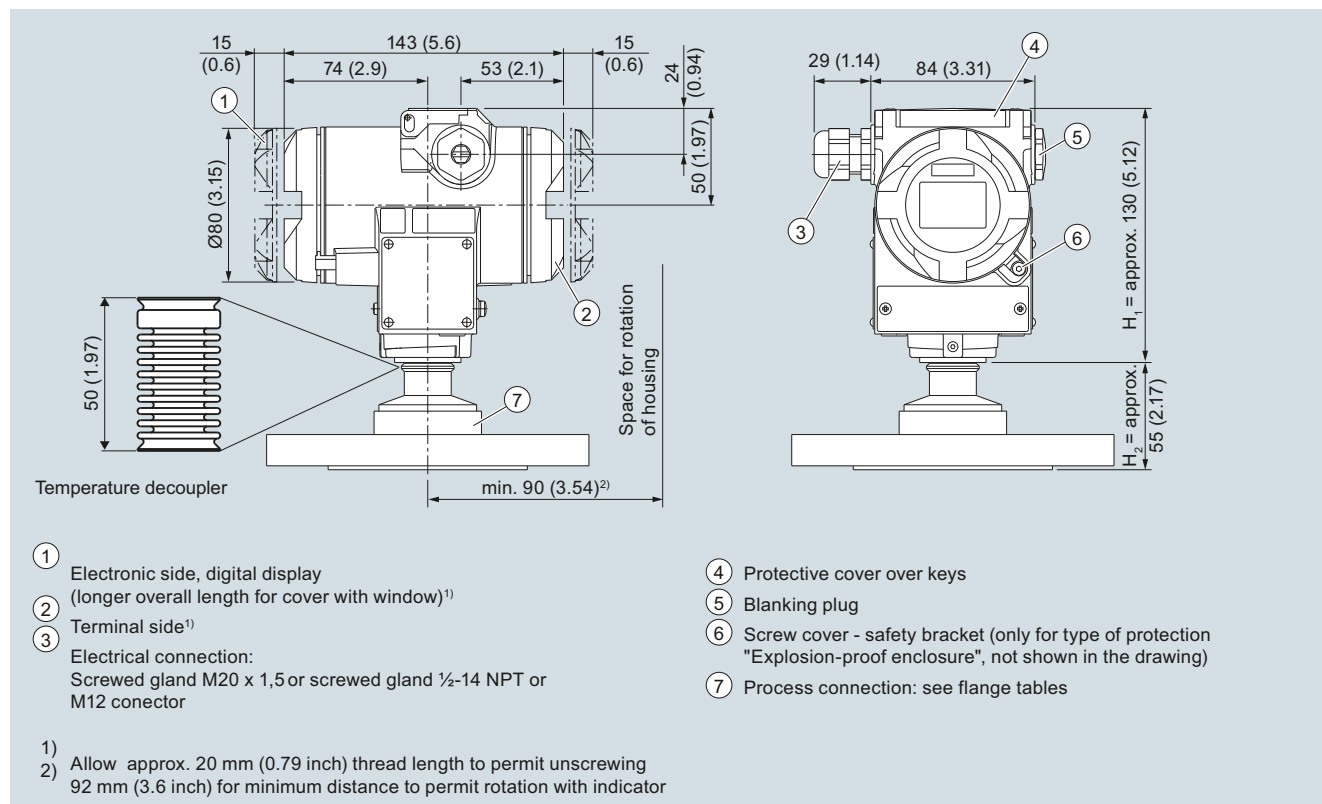
Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

1

Dimensional drawings



SITRANS P pressure transmitters, DS III series for gauge pressure, with front-flush diaphragm, dimensions in mm (inch)

The diagram shows a SITRANS P DS III with an example of a flange. In this drawing the height is subdivided into H_1 and H_2 .

H_1 = Height of the SITRANS P300 up to a defined cross-section

H_2 = Height of the flange up to this defined cross-section

Only the height H_2 is indicated in the dimensions of the flanges.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

1

Flanges as per EN and ASME

Flange to EN

| EN 1092-1 | | | | |
|------------|----|-----|---------------|-----------------------|
| Order code | DN | PN | ØD | H ₂ |
| M11 | 25 | 40 | 115 mm (4.5") | Approx. 52 mm (2") |
| M21 | 25 | 100 | 140 mm (5.5") | |
| M13 | 40 | 40 | 150 mm (5.9") | |
| M23 | 40 | 100 | 170 mm (6.7") | |
| M04 | 50 | 16 | 165 mm (6.5") | |
| M14 | 50 | 40 | 165 mm (6.5") | |
| M06 | 80 | 16 | 200 mm (7.9") | |
| M16 | 80 | 40 | 200 mm (7.9") | |

Flanges to ASME

| ASME B16.5 | | | | |
|------------|-----|-----|----------------|-----------------------|
| Order code | DN | PN | ØD | H ₂ |
| M40 | 1" | 150 | 110 mm (4.3") | Approx. 52 mm (2") |
| M41 | 1½" | 150 | 130 mm (5.1") | |
| M42 | 2" | 150 | 150 mm (5.9") | |
| M43 | 3" | 150 | 190 mm (7.5") | |
| M44 | 4" | 150 | 230 mm (9.1") | |
| M45 | 1" | 300 | 125 mm (4.9") | |
| M46 | 1½" | 300 | 155 mm (6.1") | |
| M47 | 2" | 300 | 165 mm (6.5") | |
| M48 | 3" | 300 | 210 mm (8.1") | |
| M49 | 4" | 300 | 255 mm (10.0") | |

NuG and pharmaceutical connections

Connections to DIN

| DIN 11851 (milk pipe union with slotted union nut) | | | | |
|--|----|----|---------------|-----------------------|
| Order code | DN | PN | ØD | H ₂ |
| N04 | 50 | 25 | 92 mm (3.6") | Approx. 52 mm (2") |
| N06 | 80 | 25 | 127 mm (5.0") | |

Tri-Clamp nach DIN 32676

| Order code | DN | PN | ØD | H ₂ |
|------------|----|----|--------------|-----------------------|
| N14 | 50 | 16 | 64 mm (2.5") | Approx. 52 mm (2") |
| N15 | 65 | 10 | 91 mm (3.6") | |

Other connections

| Varivent connection | | | | |
|---------------------|------------|----|--------------|-----------------------|
| Order code | DN | PN | ØD | H ₂ |
| N28 | 40 ... 125 | 40 | 84 mm (3.3") | Approx. 52 mm (2") |

Biocontrol connection

| Order code | DN | PN | ØD | H ₂ |
|------------|----|----|---------------|-----------------------|
| Q53 | 50 | 16 | 90 mm (3.5") | Approx. 52 mm (2") |
| Q54 | 65 | 16 | 120 mm (4.7") | |

Sanitary process connection to DRD

| Order code | DN | PN | ØD | H ₂ |
|------------|----|----|---------------|-----------------------|
| M32 | 50 | 40 | 105 mm (4.1") | Approx. 52 mm (2") |

Sanitary process screw connection to NEUMO Bio-Connect

| Order code | DN | PN | ØD | H ₂ |
|------------|-----|----|---------------|-----------------------|
| Q05 | 50 | 16 | 82 mm (3.2") | Approx. 52 mm (2") |
| Q06 | 65 | 16 | 105 mm (4.1") | |
| Q07 | 80 | 16 | 115 mm (4.5") | |
| Q08 | 100 | 16 | 145 mm (5.7") | |
| Q13 | 2" | 16 | 82 mm (3.2") | |
| Q14 | 2½" | 16 | 105 mm (4.1") | |
| Q15 | 3" | 16 | 105 mm (4.1") | |
| Q16 | 4" | 16 | 145 mm (5.7") | |

Sanitary process connection to NEUMO Bio-Connect flange connection

| Order code | DN | PN | ØD | H ₂ |
|------------|-----|----|---------------|-----------------------|
| Q23 | 50 | 16 | 110 mm (4.3") | Approx. 52 mm (2") |
| Q24 | 65 | 16 | 140 mm (5.5") | |
| Q25 | 80 | 16 | 150 mm (5.9") | |
| Q26 | 100 | 16 | 175 mm (6.9") | |
| Q31 | 2" | 16 | 100 mm (3.9") | |
| Q32 | 2½" | 16 | 110 mm (4.3") | |
| Q33 | 3" | 16 | 140 mm (5.5") | |
| Q34 | 4" | 16 | 175 mm (6.9") | |

Sanitary process connection to NEUMO Bio-Connect clamp connection

| Order code | DN | PN | ØD | H ₂ |
|------------|-----|----|----------------|-----------------------|
| Q39 | 50 | 16 | 77.4 mm (3.0") | Approx. 52 mm (2") |
| Q40 | 65 | 10 | 90.9 mm (3.6") | |
| Q41 | 80 | 10 | 106 mm (4.2") | |
| Q42 | 100 | 10 | 119 mm (4.7") | |
| Q48 | 2½" | 16 | 77.4 mm (3.0") | |
| Q49 | 3" | 10 | 90.9 mm (3.6") | |
| Q50 | 4" | 10 | 119 mm (4.7") | |

Sanitary process connection to NEUMO Bio-Connect S flange connection

| Order code | DN | PN | ØD | H ₂ |
|------------|-----|----|---------------|-----------------------|
| Q63 | 50 | 16 | 125 mm (4.9") | Approx. 52 mm (2") |
| Q64 | 65 | 10 | 145 mm (5.7") | |
| Q65 | 80 | 10 | 155 mm (6.1") | |
| Q66 | 100 | 10 | 180 mm (7.1") | |
| Q72 | 2" | 16 | 125 mm (4.9") | |
| Q73 | 2½" | 10 | 135 mm (5.3") | |
| Q74 | 3" | 10 | 145 mm (5.7") | |
| Q75 | 4" | 10 | 180 mm (7.1") | |

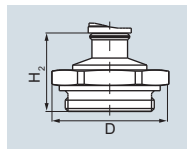
Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

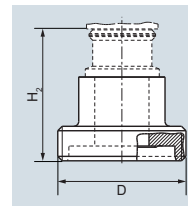
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Threaded connection G $\frac{3}{4}$ ", G1" and G2" acc. to DIN 3852



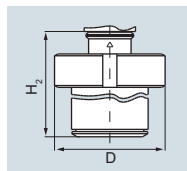
| Order code | DN | PN | ØD | H ₂ |
|------------|----|----|--------------|----------------------|
| R01 | ¾" | 60 | 37 mm (1.5") | Approx. 45 mm (1.8") |
| R02 | 1" | 60 | 48 mm (1.9") | Approx. 47 mm (1.9") |
| R04 | 2" | 60 | 78 mm (3.1") | Approx. 52 mm (2") |

Aseptic threaded socket to DIN 11864-1 Form A



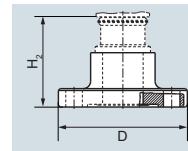
| Order code | DN | PN | ØD | H ₂ |
|------------|-----|----|-----------|--------------------|
| N33 | 50 | 25 | 78 x 1/6" | Approx. 52 mm (2") |
| N34 | 65 | 25 | 95 x 1/6" | |
| N35 | 80 | 25 | 110 x ¼" | |
| N36 | 100 | 25 | 130 x ¼" | |

Tank connection TG 52/50 and TG52/150



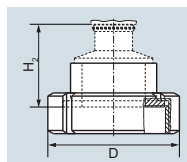
| Order code | DN | PN | ØD | H ₂ |
|------------|----|----|--------------|-----------------------|
| R10 | 25 | 40 | 63 mm (2.5") | Approx. 63 mm (2.5") |
| R11 | 25 | 40 | 63 mm (2.5") | Approx. 170 mm (6.7") |

Aseptic flange with notch to DIN 11864-2 Form A



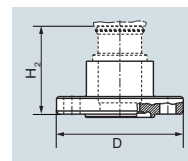
| Order code | DN | PN | ØD | H ₂ |
|------------|-----|----|-----|--------------------|
| N43 | 50 | 16 | 94 | Approx. 52 mm (2") |
| N44 | 65 | 16 | 113 | |
| N45 | 80 | 16 | 133 | |
| N46 | 100 | 16 | 159 | |

SMS socket with union nut



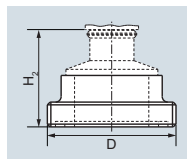
| Order code | DN | PN | ØD | H ₂ |
|------------|-----|----|---------------|--------------------|
| M67 | 2" | 25 | 84 mm (3.3") | Approx. 52 mm (2") |
| M68 | 2½" | 25 | 100 mm (3.9") | |
| M69 | 3" | 25 | 114 mm (4.5") | |

Aseptic flange with groove to DIN 11864-2 Form A



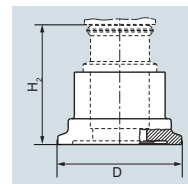
| Order code | DN | PN | ØD | H ₂ |
|------------------|-----|----|-----|--------------------|
| N43 + P11 | 50 | 16 | 94 | Approx. 52 mm (2") |
| N44 + P11 | 65 | 16 | 113 | |
| N45 + P11 | 80 | 16 | 133 | |
| N46 + P11 | 100 | 16 | 159 | |

SMS threaded socket



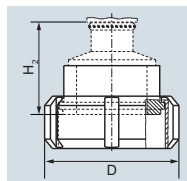
| Order code | DN | PN | ØD | H ₂ |
|------------|-----|----|-------------|--------------------|
| M73 | 2" | 25 | 70 x 1/6 mm | Approx. 52 mm (2") |
| M74 | 2½" | 25 | 85 x 1/6 mm | |
| M75 | 3" | 25 | 98 x 1/6 mm | |

Aseptic clamp with groove to DIN 11864-3 Form A



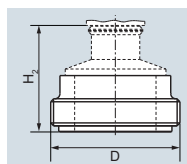
| Order code | DN | PN | ØD | H ₂ |
|------------|-----|----|------|--------------------|
| N53 | 50 | 25 | 77.5 | Approx. 52 mm (2") |
| N54 | 65 | 25 | 91 | |
| N55 | 80 | 16 | 106 | |
| N56 | 100 | 16 | 130 | |

IDF socket with union nut



| Order code | DN | PN | ØD | H ₂ |
|------------|-----|----|---------------|--------------------|
| M82 | 2" | 25 | 77 mm (3") | Approx. 52 mm (2") |
| M83 | 2½" | 25 | 91 mm (3.6") | |
| M84 | 3" | 25 | 106 mm (4.2") | |

IDF threaded socket



| Order code | DN | PN | ØD | H ₂ |
|------------|-----|----|----------------|--------------------|
| M92 | 2" | 25 | 64 mm (2.5") | Approx. 52 mm (2") |
| M93 | 2½" | 25 | 77.5 mm (3.1") | |
| M94 | 3" | 25 | 91 mm (3.6") | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure
(from gauge pressure series)

1

Technical specifications

| SITRANS P DS III series for absolute pressure (from the gauge pressure series) | | | | |
|---|---|--------------------------|--|--------------------------|
| | HART | | PROFIBUS PA and FOUNDATION Fieldbus | |
| Input | | | | |
| Measured variable | Absolute pressure | | | |
| Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure | Span (min. ... max.) | Max. perm. test pressure | Nominal measuring range | Max. perm. test pressure |
| | 8.3 ... 250 mbar a (0.12 ... 3.62 psia) | 6 bar a (87 psia) | 250 mbar a (3.6 psia) | 6 bar a (87 psia) |
| | 43 ... 1300 mbar a (0.62 ... 18.85 psi a) | 10 bar a (145 psia) | 1300 mbar a (18.9 psi a) | 10 bar a (145 psia) |
| | 160 ... 5000 mbar a (2.32 ... 72.5 psia) | 30 bar a (435 psia) | 5 bar a (72.5 psia) | 30 bar a (435 psia) |
| | 1 ... 30 bar a (14.5 ... 435 psia) | 100 bar a (1450 psia) | 30 bar a (435 psia) | 100 bar a (1450 psia) |
| Lower measuring limit | 0 mbar a (0 psia) | | | |
| • Measuring cell with silicone oil filling | | | | |
| Upper measuring limit | 100 % of max. span | | | |
| Output | | | | |
| Output signal | 4 ... 20 mA | | Digital PROFIBUS PA and FOUNDATION Fieldbus signal | |
| • Lower limit (infinitely adjustable) | 3.55 mA, factory preset to 3.84 mA | | - | |
| • Upper limit (infinitely adjustable) | 23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA | | - | |
| Load | | | | |
| • Without HART | $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V | | - | |
| • With HART | $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator) | | - | |
| Physical bus | - | | IEC 61158-2 | |
| Protection against polarity reversal | Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage. | | | |
| Electrical damping (step width 0.1 s) | Set to 2 s (0 ... 100 s) | | | |
| Measuring accuracy | | | | |
| Acc. to IEC 60770-1 | | | | |
| Reference conditions (All error data refer always refer to the set span) | Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span / set span) | | | |
| Error in measurement at limit setting incl. hysteresis and reproducibility | | | | |
| • Linear characteristic | | | ≤ 0.1 % | |
| - r ≤ 10 | ≤ 0.1 % | | | |
| - 10 < r ≤ 30 | ≤ 0.2 % | | | |
| Long-term stability (temperature change ± 30 °C (± 54 °F)) | ≤ (0.1 · r) %/year | | ≤ 0.1 %/year | |
| Influence of ambient temperature | | | | |
| • at -10 ... +60 °C (14 ... 140 °F) | ≤ (0.1 · r + 0.2) % ¹⁾ | | ≤ 0.3 % | |
| • at -40 ... -10 °C and 60 ... 85 °C (-40 ... +14 °F and 140 ... 185 °F) | ≤ (0.1 · r + 0.15) %/10 K | | ≤ 0.25 %/10 K | |
| Measured Value Resolution | - | | 3 · 10 ⁻⁵ of nominal measuring range | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure (from gauge pressure series)

1

| SITRANS P DS III series for absolute pressure (from the gauge pressure series) | | |
|---|--|-------------------------------------|
| | HART | PROFIBUS PA and FOUNDATION Fieldbus |
| Rated conditions | | |
| Degree of protection (to IEC 60529) | IP65 (optional IP65/IP68) | |
| Temperature of medium | -40 ... +100 °C (-40 ... +212 °F) | |
| • Measuring cell with silicone oil filling | -20 ... +100 °C (-4 ... +212 °F) with 30 bar a measuring cell | |
| • Measuring cell with inert filling liquid | -20 ... +100 °C (-4 ... +212 °F) | |
| • In conjunction with dust explosion protection | -20 ... +60 °C (-4 ... +140 °F) | |
| Ambient conditions | | |
| • Ambient temperature | -40 ... +85 °C (-40 ... +185 °F) | |
| - Transmitter (with 4-wire connection, observe temperature values of supplementary 4-wire electronics) | -40 ... +85 °C (-40 ... +185 °F) | |
| - Display readable | -30 ... +85 °C (-22 ... +185 °F) | |
| • Storage temperature | -50 ... +85 °C (-58 ... +185 °F) | |
| • Climatic class | Relative humidity 0 ... 100 % | |
| - Condensation | Condensation permissible, suitable for use in the tropics | |
| • Electromagnetic Compatibility | Acc. to IEC 61326 and NAMUR NE 21 | |
| - Emitted interference and interference immunity | Acc. to IEC 61326 and NAMUR NE 21 | |
| Design | | |
| Weight (without options) | ≈ 1.5 kg (≈ 3.3 lb) | |
| Enclosure material | Low-copper die-cast aluminum, GD-AISI 12 or stainless steel precision casting, mat. no. 1.4408 | |
| Wetted parts materials | Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4610 | |
| • Connection shank | Stainless steel, mat. no. 1.4404/316L | |
| • Oval flange | Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819 | |
| • Seal diaphragm | Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819 | |
| Measuring cell filling | Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F)) | |
| Process connection | Connection shank G $\frac{1}{2}$ B to EN 837-1, female thread $\frac{1}{2}$ -14 NPT or oval flange (PN 160 (MAWP 2320 psia)) to DIN 19213 with mounting thread M10 or $\frac{7}{16}$ -20 UNF to IEC 61518 | |
| Material of mounting bracket | Sheet-steel, Mat. No. 1.0330, chrome-plated | |
| • Steel | Sheet-steel, Mat. No. 1.0330, chrome-plated | |
| • Stainless steel | Sheet stainless steel, mat. no. 1.4301 (SS 304) | |
| Power supply U_H | | Supplied through bus |
| Terminal voltage on transmitter | 10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode | - |
| Separate 24 V power supply necessary | - | No |
| Bus voltage | | |
| • Not Ex | - | 9 ... 32 V |
| • With intrinsically-safe operation | - | 9 ... 24 V |
| Current consumption | | |
| • Basic current (max.) | - | 12.5 mA |
| • Start-up current \leq basic current | - | Yes |
| • Max. current in event of fault | - | 15.5 mA |
| Fault disconnection electronics (FDE) available | - | Yes |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure
(from gauge pressure series)

1

SITRANS P DS III series for absolute pressure (from the gauge pressure series)

| | HART | PROFIBUS PA and FOUNDATION Fieldbus |
|---|--|--|
| Certificates and approvals | | |
| Classification according to PED 97/23/EC | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) | |
| Explosion protection | | |
| • Intrinsic safety "i" | | PTB 13 ATEX 2007 X |
| - Marking | | Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb |
| - Permissible ambient temperature | | -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6 |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$ | FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Explosion-proof "d" | | PTB 99 ATEX 1160 |
| - Marking | | Ex II 1/2 G Ex d IIC T4/T6 Gb |
| - Permissible ambient temperature | | -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6 |
| - Connection | To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ | To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$ |
| • Dust explosion protection for zone 20 | | PTB 01 ATEX 2055 |
| - Marking | | Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C |
| - Permissible ambient temperature | | -40 ... +85 °C (-40 ... +185 °F) |
| - Max. surface temperature | | 120 °C (248 °F) |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$ | FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Dust explosion protection for zone 21/22 | | PTB 01 ATEX 2055 |
| - Marking | | Ex II 2 D IP65 T 120 °C |
| - Connection | To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\text{max}} = 1.2 \text{ W}$ | To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\text{max}} = 1 \text{ W}$ |
| • Type of protection "n" (zone 2) | | PTB 13 ATEX 2007 X |
| - Marking | | Ex II 2/3 G Ex nA II T4/T5/T6 Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gc |
| - Connection (Ex nA) | $U_m = 45 \text{ V}$ | $U_m = 32 \text{ V}$ |
| - Connection (Ex ic) | To circuits with values: $U_i = 45 \text{ V}$ | FISCO supply unit ic: $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Explosion protection acc. to FM | | Certificate of Compliance 3008490 |
| - Identification (XP/DIP) or (IS); (NI) | | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III |
| • Explosion protection to CSA | | Certificate of Compliance 1153651 |
| - Identification (XP/DIP) or (IS) | | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III |

¹⁾ Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.08. r + 0.16) % / 28 °C (50 °F).

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure (from gauge pressure series)

1

HART communication

| | |
|-----------------------|------------------|
| HART | 230 ... 1100 Ω |
| Protocol | HART Version 5.x |
| Software for computer | SIMATIC PDM |

PROFIBUS PA communication

| | |
|---|--|
| Simultaneous communication with master class 2 (max.) | 4 |
| The address can be set using | Configuration tool or local operation (standard setting address 126) |
| Cyclic data usage | |
| • Output byte | 5 (one measured value) or 10 (two measured values) |
| • Input byte | 0, 1, or 2 (register operating mode and reset function for metering) |
| Internal preprocessing | |
| Device profile | PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B |
| Function blocks | 2 |
| • Analog input | |
| - Adaptation to customer-specific process variables | Yes, linearly rising or falling characteristic |
| - Electrical damping, adjustable | 0 to 100 s |
| - Simulation function | Input /Output |
| - Failure mode | parameterizable (last good value, substitute value, incorrect value) |
| - Limit monitoring | Yes, one upper and lower warning limit and one alarm limit respectively |
| • Register (totalizer) | Can be reset, preset, optional direction of counting, simulation function of register output |
| - Failure mode | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |
| - Limit monitoring | One upper and lower warning limit and one alarm limit respectively |
| • Physical block | 1 |
| Transducer blocks | 2 |
| • Pressure transducer block | |
| - Can be calibrated by applying two pressures | Yes |
| - Monitoring of sensor limits | Yes |
| - Specification of a container characteristic with | Max. 30 nodes |
| - Square-rooted characteristic for flow measurement | Yes |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable |
| - Simulation function for measured pressure value and sensor temperature | Constant value or over parameterizable ramp function |

FOUNDATION Fieldbus communication

| | |
|--|---|
| Function blocks | 3 function blocks analog input, 1 function block PID |
| • Analog input | |
| - Adaptation to customer-specific process variables | Yes, linearly rising or falling characteristic |
| - Electrical damping, adjustable | 0 ... 100 s |
| - Simulation function | Output/input (can be locked within the device with a bridge) |
| - Failure mode | parameterizable (last good value, substitute value, incorrect value) |
| - Limit monitoring | Yes, one upper and lower warning limit and one alarm limit respectively |
| - Square-rooted characteristic for flow measurement | Yes |
| • PID | Standard FOUNDATION Fieldbus function block |
| • Physical block | 1 resource block |
| Transducer blocks | 1 transducer block Pressure with calibration, 1 transducer block LCD |
| • Pressure transducer block | |
| - Can be calibrated by applying two pressures | Yes |
| - Monitoring of sensor limits | Yes |
| - Simulation function: Measured pressure value, sensor temperature and electronics temperature | Constant value or over parameterizable ramp function |

Pressure Measurement


Transmitters for general requirements

SITRANS P DS III for absolute pressure
(from gauge pressure series)

1

| Selection and Ordering data | | Article No. |
|---|------------------------------------|-----------------|
| Pressure transmitters for absolute pressure from gauge pressure series | | 7MF4233- |
| SITRANS P DS III with HART | | |
| Measuring cell filling | Measuring cell cleaning | |
| Silicone oil | normal | 1 |
| Inert liquid ¹⁾ | grease-free to cleanliness level 2 | 3 |
| Measuring span (min. ... max.) | | |
| 8.3 ... 250 mbar a | (0.12 ... 3.62 psia) | D |
| 43 ... 1300 mbar a | (0.62 ... 18.85 psia) | F |
| 0.16 ... 5 bar a | (2.32 ... 72.5 psia) | G |
| 1 ... 30 bar a | (14.5 ... 435 psia) | H |
| Wetted parts materials | | |
| Seal diaphragm | Process connection | |
| Stainless steel | Stainless steel | A |
| Hastelloy | Stainless steel | B |
| Hastelloy | Hastelloy | C |
| Version for diaphragm seal ^{2) 3) 4) 5) 6)} | | Y |
| Process connection | | |
| • Connection shank G $\frac{1}{2}$ B to EN 837-1 | | 0 |
| • Female thread $\frac{1}{2}$ -14 NPT | | 1 |
| • Stainless steel oval flange with process connection (Oval flange has no female thread) | | |
| - Mounting thread $\frac{1}{16}$ -20 UNF to EN 61518 | | 2 |
| - Mounting thread M10 to DIN 19213 | | 3 |
| - Mounting thread M12 to DIN 19213 | | 4 |
| • Male thread M20 x 1.5 | | 5 |
| • Male thread $\frac{1}{2}$ -14 NPT | | 6 |
| Non-wetted parts materials | | |
| • Housing made of die-cast aluminium | | 0 |
| • Housing stainless steel precision casting ⁷⁾ | | 3 |
| Version | | |
| • Standard versions | | 1 |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | | 2 |
| Explosion protection | | |
| • None | | A |
| • With ATEX, Type of protection: | | |
| - "Intrinsic safety (Ex ia)" | | B |
| - "Explosion-proof (Ex d) ⁸⁾ | | D |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) ⁹⁾ | | P |
| - "Ex nA/ic (Zone 2) ¹⁰⁾ | | E |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D) ⁹⁾ | | R |
| • FM + CSA intrinsic safe (is) | | F |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | | S |
| • With FM + CSA, Type of protection: | | |
| - "Intrinsic Safe und Explosion Proof (is + xp) ⁸⁾ | | NC |
| Electrical connection/cable entry | | |
| • Screwed gland Pg 13.5 ¹¹⁾ | | A |
| • Screwed gland M20x1.5 | | B |
| • Screwed gland $\frac{1}{2}$ -14 NPT | | C |
| • Han 7D plug (plastic housing) incl. mating connector ¹¹⁾ | | D |
| • M12 connectors (stainless steel) ^{12) 13) 14)} | | F |

| Selection and Ordering data | | Article No. |
|---|--|-----------------|
| Pressure transmitters for absolute pressure from gauge pressure series | | 7MF4233- |
| SITRANS P DS III with HART | | |
| Display | | |
| • Without display | | 0 |
| • Without visible display (display concealed, setting: mA) | | 1 |
| • With visible display | | 6 |
| • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required) | | 7 |

• We can offer shorter delivery times for configurations designated with the Quick Ship Symbol . For details see page 9/5 in the appendix.

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

- For oxygen application, add Order code E10.
- Version 7MF4233-1DY... only up to max. span 200 mbar a (80 inH₂O a).
- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here. If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF4233-...Y...-... and 7MF4900-1...-B
- The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- Not in conjunction with Electrical connection "Screwed gland Pg 13.5" and "Han7D plug".
- Without cable gland, with blanking plug.
- With enclosed cable gland Ex ia and blanking plug.
- Configurations with HAN and M12 connectors are only available in Ex ic.
- Not in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof".
- M12 delivered without cable socket
- Not available with protection type "Ex d" (optiones D, P, N and R)
- Not with protection types „Explosion-proof“ and „Ex nA“, „Intrinsic safe“ and „Explosion proof“.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure (from gauge pressure series)

1

| Selection and Ordering data | | Article No. |
|--|------------------------------------|----------------|
| Pressure transmitters for absolute pressure from gauge pressure series | | |
| SITRANS P DS III with PROFIBUS PA (PA) | | 7 MF 4 2 3 4 - |
| SITRANS P DS III with FOUNDATION Fieldbus (FF) | | 7 MF 4 2 3 5 - |
| Measuring cell filling | | |
| Silicone oil | normal | 1 |
| Inert liquid ¹⁾ | grease-free to cleanliness level 2 | 3 |
| Nominal measuring range | | |
| 250 mbar a | (3.62 psia) | D |
| 1300 mbar a | (18.85 psia) | F |
| 5 bar a | (72.5 psia) | G |
| 30 bar a | (435 psia) | H |
| Wetted parts materials | | |
| Seal diaphragm | Process connection | |
| Stainless steel | Stainless steel | A |
| Hastelloy | Stainless steel | B |
| Hastelloy | Hastelloy | C |
| Version as diaphragm seal ^{2) 3) 4) 5) 6)} | | Y |
| Process connection | | |
| • Connection shank G½B to EN 837-1 | | 0 |
| • Female thread ½-14 NPT | | 1 |
| • Stainless steel oval flange with process connection (Oval flange has no female thread) | | |
| - Mounting thread 7/16-20 UNF to IEC 61518 | | 2 |
| - Mounting thread M10 to DIN 19213 | | 3 |
| - Mounting thread M12 to DIN 19213 | | 4 |
| • Male thread M20 x 1.5 | | 5 |
| • Male thread ½-14 NPT | | 6 |
| Non-wetted parts materials | | |
| • Housing made of die-cast aluminium | | 0 |
| • Housing stainless steel precision casting | | 3 |
| Version | | |
| • Standard versions | | 1 |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | | 2 |
| Explosion protection | | |
| • None | | A |
| • With ATEX, Type of protection: | | |
| - "Intrinsic safety (Ex ia)" | | B |
| - "Explosion-proof (Ex d) ⁷⁾ | | D |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) ⁸⁾ | | P |
| - "Ex nA/ic (Zone 2)" ⁹⁾ | | E |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D) ⁸⁾ (not for DS III FF) | | R |
| • FM + CSA intrinsic safe (is) | | F |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | | S |
| • With FM + CSA, Type of protection: | | |
| - "Intrinsic Safe und Explosion Proof (is + xp) ⁷⁾ | | NC |
| Electrical connection/cable entry | | |
| • Screwed gland M20 x 1.5 | | B |
| • Screwed gland ½-14 NPT | | C |
| • M12 connectors (stainless steel) ^{10) 11)} | | F |

| Selection and Ordering data | | Article No. |
|---|--|----------------|
| Pressure transmitters for absolute pressure from gauge pressure series | | |
| SITRANS P DS III with PROFIBUS PA (PA) | | 7 MF 4 2 3 4 - |
| SITRANS P DS III with FOUNDATION Fieldbus (FF) | | 7 MF 4 2 3 5 - |
| Display | | |
| • Without display | | 0 |
| • Without visible display (display concealed, setting: bar) | | 1 |
| • With visible display | | 6 |
| • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required) | | 7 |
| Included in delivery of the device: | | |
| • Brief instructions (Leporello) | | |
| • CD-ROM with detailed documentation | | |
| ¹⁾ For oxygen application, add Order code E10. ²⁾ Version 7MF4233-1DY... only up to max. span 200 mbar a (2.9 psia). ³⁾ When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. ⁴⁾ If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. ⁵⁾ The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF423-..Y.-... and 7MF4900-1...-B ⁶⁾ The standard measuring cell filling for configurations with remote seals (Y) is silicone oil. ⁷⁾ Without cable gland, with blanking plug. ⁸⁾ With enclosed cable gland Ex ia and blanking plug. ⁹⁾ Configurations with HAN and M12 connectors are only available in Ex ic. ¹⁰⁾ M12 delivered without cable socket ¹¹⁾ Not with protection types „Explosion-proof“ and „Ex nA“, „Intrinsic safe“ and „Explosion proof“. | | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure
(from gauge pressure series)

1

| Selection and Ordering data | Order code | | |
|---|-------------------|----|----|
| Further designs | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code. | | | |
| Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of: | | | |
| • Steel | ◆ A01 | ✓ | ✓ |
| • Stainless steel | ◆ A02 | ✓ | ✓ |
| Plug | | | |
| • Han 7D (metal, gray) | A30 | ✓ | |
| • Han 8U (instead of Han 7D) | A31 | ✓ | |
| • Angled | A32 | ✓ | |
| • Han 8D (metal, gray) | A33 | ✓ | |
| Cable sockets for M12 connectors (stainless steel) | A50 | ✓ | ✓ |
| Rating plate inscription (instead of German) | | | |
| • English | ◆ B11 | ✓ | ✓ |
| • French | ◆ B12 | ✓ | ✓ |
| • Spanish | ◆ B13 | ✓ | ✓ |
| • Italian | ◆ B14 | ✓ | ✓ |
| English rating plate | ◆ B21 | ✓ | ✓ |
| Pressure units in inH ₂ O and/or psi | | | |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2¹⁾ | ◆ C11 | ✓ | ✓ |
| Inspection certificate²⁾ | ◆ C12 | ✓ | ✓ |
| Acc. to EN 10204-3.1 | | | |
| Factory certificate | ◆ C14 | ✓ | ✓ |
| Acc. to EN 10204-2.2 | | | |
| Functional safety (SIL2) | ◆ C20 | ✓ | |
| Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | | | |
| Functional safety (PROFIsafe) Certificate and PROFIsafe protocol | C21 ³⁾ | ✓ | |
| Functional safety (SIL2/3) | ◆ C23 | ✓ | |
| Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | | | |
| Device passport Russia | C99 | ✓ | ✓ |
| (For price request please contact the technical support www.siemens.com/automation/support-request) | | | |
| Setting of upper limit of output signal to 22.0 mA | D05 | ✓ | |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) | D07 | ✓ | ✓ |
| Degree of protection IP65/IP68 (only for M20 x 1.5 and ½-14 NPT) | D12 | ✓ | ✓ |
| Supplied with oval flange (1 item), PTFE packing and screws in thread of oval flange | D37 | ✓ | ✓ |

| Selection and Ordering data | Order code | | |
|---|-------------------|----|----|
| Further designs | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code. | | | |
| Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia")) | E01 | ✓ | ✓ |
| Oxygen application (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F)) | E10 | ✓ | ✓ |
| Export approval Korea | E11 | ✓ | ✓ |
| CRN approval Canada (Canadian Registration Number) | E22 | ✓ | ✓ |
| Dual seal | E24 | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..) | E25 ⁴⁾ | ✓ | ✓ |
| "Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..) | E26 ⁴⁾ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..) | E28 ⁴⁾ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..) | E45 ⁴⁾ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex id) (only for transmitter 7MF4...-.....-D..) | E46 ⁴⁾ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..) | E55 ⁴⁾ | ✓ | ✓ |
| Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..) | E56 ⁴⁾ | ✓ | ✓ |
| Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..) | E57 ⁴⁾ | ✓ | ✓ |
| "Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11) | E70 ⁴⁾ | ✓ | ✓ |
| Two coats of lacquer on casing and cover (PU on epoxy) | G10 | ✓ | ✓ |
| Transient protector 6 kV (lightning protection) | J01 | ✓ | ✓ |

◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

¹⁾ When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

²⁾ If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

³⁾ Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

⁴⁾ Option does not include ATEX approval, but instead includes only the country-specific approval.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure (from gauge pressure series)

1

| Selection and Ordering data | Order code | | | |
|--|-------------|------|-----------------|----|
| Additional data | | HART | PA | FF |
| Please add "-Z" to Article No. and specify Order code(s) and plain text. | | | | |
| Measuring range to be set Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi | ◆ Y01 | ✓ | ✓ ¹⁾ | |
| Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15: | ◆ Y15 | ✓ | ✓ | ✓ |
| Measuring point text (entry in device variable) Max. 27 characters, specify in plain text: Y16: | ◆ Y16 | ✓ | ✓ | ✓ |
| Entry of HART address (TAG) Max. 8 characters, specify in plain text: Y17: | ◆ Y17 | ✓ | | |
| Setting of pressure indication in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O [*] , inH ₂ O [*] , ftH ₂ O [*] , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or % *) ref. temperature 20 °C | ◆ Y21 | ✓ | ✓ | ✓ |
| Setting of pressure indication in non-pressure units²⁾ Specify in plain text: Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters) | ◆ Y22 + Y01 | ✓ | | |
| Preset bus address possible between 1 and 126 Specify in plain text: Y25: | Y25 | | ✓ | ✓ |
| Damping adjustment in seconds (0 ... 100 s) | Y30 | ✓ | ✓ | ✓ |

- ◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix.

Factory mounting of valve manifolds, see accessories.

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

¹⁾ Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

²⁾ Preset values can only be changed over SIMATIC PDM.

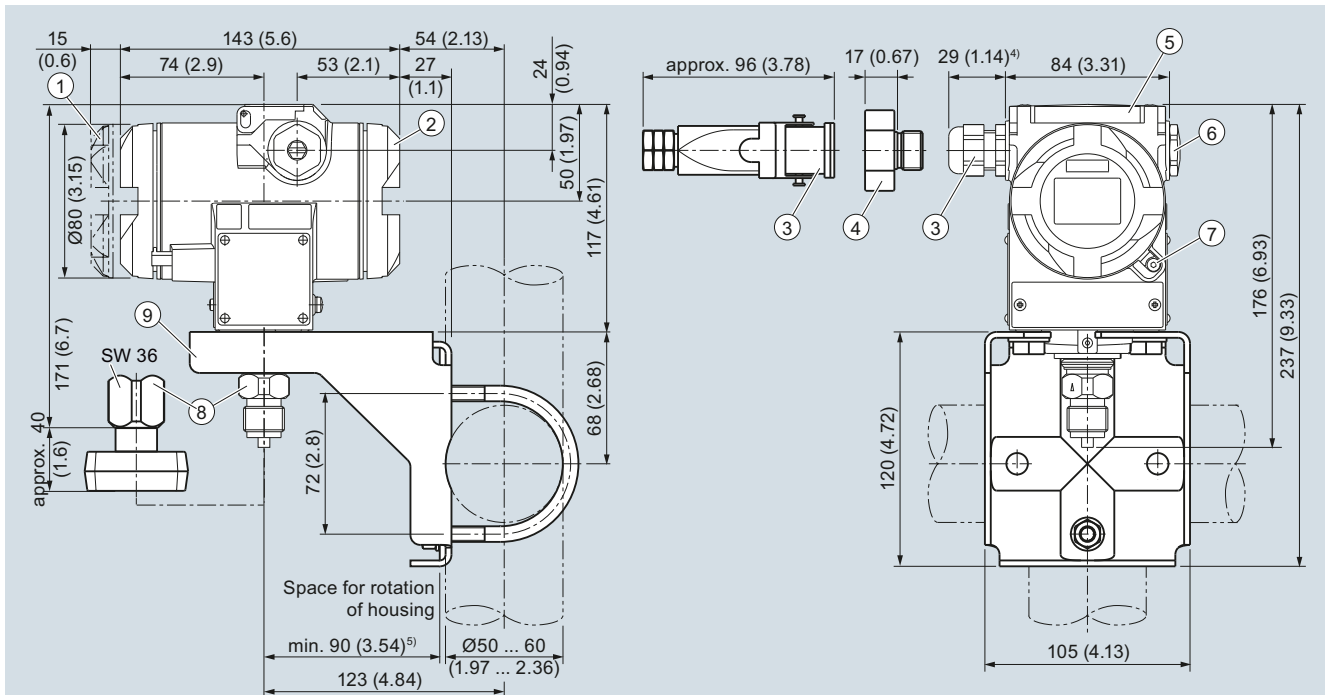
Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure
(from gauge pressure series)

1

Dimensional drawings



- ① Electronic side, digital display
(longer overall length for cover with window)¹⁾
- ② Terminal side¹⁾
- ③ Electrical connection:
Screwed gland Pg 13,5 (adapter)(Adapter)^{2) 3)},
Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or
Han 7D/Han 8D^{2) 3)} plug
- ④ Harting adapter
- ⑤ Protective cover over keys
- ⑥ Blanking plug
- ⑦ Screw cover - safety bracket (only for type of protection
"Explosion-proof enclosure", not shown in the drawing)
- ⑧ Process connection: Connection shank G½B or Oval flange
- ⑨ Mounting bracket (option)

- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "Explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA" [IS + XP]"
- 4) For Pg 13,5 with adapter approx. 45 mm (1.77 inch)
- 5) Minimum distance for rotating

SITRANS P DS III pressure transmitters for absolute pressure, from the pressure series, dimensions in mm (inch)

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure
(from differential pressure series)

1

Technical specifications

| SITRANS P, DS III for absolute pressure (from the differential pressure series) | | | | |
|--|--|--|--|--|
| | HART | | PROFIBUS PA and FOUNDATION Fieldbus | |
| Input | | | | |
| Measured variable | Absolute pressure | | | |
| Spans (infinitely adjustable) or nominal measuring range and max. permissible operating pressure | Span (min. ... max.) | Maximum operating pressure | Nominal measuring range | Maximum operating pressure |
| | 8.3 ... 250 mbar a (0.12 ... 3.62 psia) | 32 bar a (464 psia) | 250 mbar a (3.62 psia) | 32 bar a (464 psia) |
| | 43 ... 1300 mbar a (0.62 ... 18.85 psia) | 32 bar a (464 psia) | 1300 bar a (18.85 psia) | 32 bar a (464 psia) |
| | 160 ... 5000 mbar a (2.32 ... 72.52 psia) | 32 bar a (464 psia) | 5 bar a (72.5 psia) | 32 bar a (464 psia) |
| | 1 ... 30 bar a (14.5 ... 435 psia) | 160 bar a (2320 psia) | 30 bar a (435 psia) | 160 bar a (2320 psia) |
| | 5.3 ... 100 bar a (76.9 ... 1450 psia) | 160 bar a (2320 psia) (for connection thread M10 and 7/16-20 UNF in the process flanges) | 100 bar a (1450 psia) | 160 bar a (2320 psia) (for connection thread M10 and 7/16-20 UNF in the process flanges) |
| Lower measuring limit | 0 mbar a (0 psia) | | | |
| • Measuring cell with silicone oil filling | | | | |
| Upper measuring limit | 100 % of max. span | | | |
| Output | | | | |
| Output signal | 4 ... 20 mA | | Digital PROFIBUS PA and FOUNDATION Fieldbus signal | |
| • Lower limit (infinitely adjustable) | 3.55 mA, factory preset to 3.84 mA | | - | |
| • Upper limit (infinitely adjustable) | 23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA | | - | |
| Load | | | | |
| • Without HART | $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V | | - | |
| • With HART | $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator) | | - | |
| Physical bus | - | | IEC 61158-2 | |
| Protection against polarity reversal | Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage. | | | |
| Electrical damping (step width 0.1 s) | Set to 2 s (0 ... 100 s) | | | |
| Measuring accuracy | | | | |
| Acc. to IEC 60770-1 | | | | |
| Reference conditions (All error data refer always refer to the set span) | Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio ($r = \text{max. span} / \text{set span}$) | | | |
| Error in measurement at limit setting incl. hysteresis and reproducibility | | | | |
| • Linear characteristic | | | $\leq 0.1 \%$ | |
| - $r \leq 10$ | $\leq 0.1 \%$ | | | |
| - $10 < r \leq 30$ | $\leq 0.2 \%$ | | | |
| Long-term stability (temperature change $\pm 30 \text{ °C}$ ($\pm 54 \text{ °F}$)) | $\leq (0.1 \cdot r) \%/ \text{year}$ | | $\leq 0.1 \%/ \text{year}$ | |
| Influence of ambient temperature | | | | |
| • at -10 ... +60 °C (14 ... 140 °F) | $\leq (0.1 \cdot r + 0.2) \%^1$ | | $\leq 0.3 \%$ | |
| • at -40 ... -10 °C and 60 ... 85 °C (-40 ... +14 °F and 140 ... 185 °F) | $\leq (0.1 \cdot r + 0.15) \%/10 \text{ K}$ | | $\leq 0.25 \%/10 \text{ K}$ | |
| Measured Value Resolution | - | | $3 \cdot 10^{-5}$ of nominal measuring range | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure
(from differential pressure series)

1

| SITRANS P, DS III for absolute pressure (from the differential pressure series) | | HART | PROFIBUS PA and FOUNDATION Fieldbus |
|---|---|------|---|
| Rated conditions | | | |
| Degree of protection (to IEC 60529) | | | IP65 (optional IP65/IP68) |
| Temperature of medium | | | |
| • Measuring cell with silicone oil filling | | | -40 ... +100 °C (-40 ... +212 °F) |
| • Measuring cell with inert filling liquid | | | -20 ... +100 °C (-4 ... +212 °F) |
| • In conjunction with dust explosion protection | | | -20 ... +60 °C (-4 ... +140 °F) |
| Ambient conditions | | | |
| • Ambient temperature | | | |
| - Transmitter (with 4-wire connection, observe temperature values of supplementary 4-wire electronics) | | | -40 ... +85 °C (-40 ... +185 °F) |
| - Display readable | | | -30 ... +85 °C (-22 ... +185 °F) |
| • Storage temperature | | | -50 ... +85 °C (-58 ... +185 °F) |
| • Climatic class | | | |
| - Condensation | | | Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics |
| • Electromagnetic Compatibility | | | |
| - Emitted interference and interference immunity | | | Acc. to IEC 61326 and NAMUR NE 21 |
| Design | | | |
| Weight (without options) | | | ≈ 4.5 kg (≈ 9.9 lb) |
| Enclosure material | | | Low-copper die-cast aluminum, GD-AISI12 or stainless steel precision casting, mat. no. 1.4408 |
| Wetted parts materials | | | |
| • Seal diaphragm | | | Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold |
| • Process flanges and sealing screw | | | Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4610 or Monel, mat. no. 2.4360 |
| • O-Ring | | | FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR |
| Measuring cell filling | | | Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F)) |
| Process connection | | | 1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to IEC 61518 |
| Material of mounting bracket | | | |
| • Steel | | | Sheet-steel, Mat. No. 1.0330, chrome-plated |
| • Stainless steel | | | Sheet stainless steel, mat. no. 1.4301 (SS 304) |
| Power supply U_H | | | Supplied through bus |
| Terminal voltage on transmitter | 10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode | | - |
| Separate 24 V power supply necessary | - | | No |
| Bus voltage | | | |
| • Not Ex | - | | 9 ... 32 V |
| • With intrinsically-safe operation | - | | 9 ... 24 V |
| Current consumption | | | |
| • Basic current (max.) | - | | 12.5 mA |
| • Start-up current ≤ basic current | - | | Yes |
| • Max. current in event of fault | - | | 15.5 mA |
| Fault disconnection electronics (FDE) available | - | | Yes |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure (from differential pressure series)

1

| SITRANS P, DS III for absolute pressure (from the differential pressure series) | | |
|---|---|--|
| | HART | PROFIBUS PA and FOUNDATION Fieldbus |
| Certificates and approvals | | |
| Classification according to PED 97/23/EC | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) | |
| Explosion protection | | |
| • Intrinsic safety "i" | PTB 13 ATEX 2007 X | |
| - Marking | Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6 | |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$ | FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Explosion-proof "d" | PTB 99 ATEX 1160 | |
| - Marking | Ex II 1/2 G Ex d IIC T4/T6 Gb | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6 | |
| - Connection | To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ | To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$ |
| • Dust explosion protection for zone 20 | PTB 01 ATEX 2055 | |
| - Marking | Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) | |
| - Max. surface temperature | 120 °C (248 °F) | |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$ | FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Dust explosion protection for zone 21/22 | PTB 01 ATEX 2055 | |
| - Marking | Ex II 2 D IP65 T 120 °C | |
| - Connection | To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$ | To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$ |
| • Type of protection "n" (zone 2) | PTB 13 ATEX 2007 X | |
| - Marking | Ex II 2/3 G Ex nA II T4/T5/T6 Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gc | |
| - Connection (Ex nA) | $U_m = 45 \text{ V}$ | $U_m = 32 \text{ V}$ |
| - Connection (Ex ic) | To circuits with values: $U_i = 45 \text{ V}$ | FISCO supply unit ic: $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Explosion protection acc. to FM | Certificate of Compliance 3008490 | |
| - Identification (XP/DIP) or (IS); (NI) | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III | |
| • Explosion protection to CSA | Certificate of Compliance 1153651 | |
| - Identification (XP/DIP) or (IS) | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III | |

¹⁾ Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.08. r + 0.16) % / 28 °C (50 °F).

Pressure Measurement

Transmitters for general requirements

**SITRANS P DS III for absolute pressure
(from differential pressure series)**

1

| HART communication | |
|---|--|
| HART | 230 ... 1100 Ω |
| Protocol | HART Version 5.x |
| Software for computer | SIMATIC PDM |
| PROFIBUS PA communication | |
| Simultaneous communication with master class 2 (max.) | 4 |
| The address can be set using | Configuration tool or local operation (standard setting address 126) |
| Cyclic data usage | |
| • Output byte | 5 (one measured value) or 10 (two measured values) |
| • Input byte | 0, 1, or 2 (register operating mode and reset function for metering) |
| Internal preprocessing | |
| Device profile | PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B |
| Function blocks | 2 |
| • Analog input | |
| - Adaptation to customer-specific process variables | Yes, linearly rising or falling characteristic |
| - Electrical damping, adjustable | 0 ... 100 s |
| - Simulation function | Input /Output |
| - Failure mode | parameterizable (last good value, substitute value, incorrect value) |
| - Limit monitoring | Yes, one upper and lower warning limit and one alarm limit respectively |
| • Register (totalizer) | Can be reset, preset, optional direction of counting, simulation function of register output |
| - Failure mode | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |
| - Limit monitoring | One upper and lower warning limit and one alarm limit respectively |
| • Physical block | 1 |
| Transducer blocks | 2 |
| • Pressure transducer block | |
| - Can be calibrated by applying two pressures | Yes |
| - Monitoring of sensor limits | Yes |
| - Specification of a container characteristic with | Max. 30 nodes |
| - Square-rooted characteristic for flow measurement | Yes |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable |
| - Simulation function for measured pressure value and sensor temperature | Constant value or over parameterizable ramp function |

FOUNDATION Fieldbus communication

Function blocks

3 function blocks analog input, 1 function block PID

• Analog input

- Adaptation to customer-specific process variables
- Electrical damping, adjustable
- Simulation function
- Failure mode

Yes, linearly rising or falling characteristic

0 to 100 s

Output/input (can be locked within the device with a bridge)

parameterizable (last good value, substitute value, incorrect value)

Yes, one upper and lower warning limit and one alarm limit respectively

Yes

- Square-rooted characteristic for flow measurement

• PID

Standard FOUNDATION Fieldbus function block

• Physical block

1 resource block

Transducer blocks

1 transducer block Pressure with calibration, 1 transducer block LCD

• Pressure transducer block

- Can be calibrated by applying two pressures

Yes

- Monitoring of sensor limits

Yes

- Simulation function: Measured pressure value, sensor temperature and electronics temperature

Constant value or over parameterizable ramp function

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure (from differential pressure series)

1

| Selection and Ordering data | | Article No. |
|---|---|------------------|
| Pressure transmitters for absolute pressure from differential pressure series, SITRANS P DS III with HART | | 7MF4333 - |
| Measuring cell filling | Measuring cell cleaning | |
| Silicone oil | normal | 1 |
| Inert liquid ¹⁾ | grease-free to cleanliness level 2 | 3 |
| Measuring span (min. ... max.) | | |
| 8.3 ... 250 mbar a | (0.12 ... 3.62 psia) | D |
| 43 ... 1300 mbar a | (0.62 ... 18.85 psia) | F |
| 0.16 ... 5 bar a | (2.32 ... 72.5 psia) | G |
| 1 ... 30 bar a | (14.5 ... 435 psia) | H |
| 5.3 ... 100 bar a | (76.9 ... 1450 psia) | KE |
| Wetted parts materials | | |
| Seal diaphragm | Parts of measuring cell | |
| Stainless steel | Stainless steel | A |
| Hastelloy | Stainless steel | B |
| Hastelloy | Hastelloy | C |
| Tantalum | Tantalum | E |
| Monel | Monel | H |
| Gold | Gold | L |
| Version for diaphragm seal ^{2) 3) 4) 5) 6)} | | Y |
| Process connection | | |
| Female thread 1/4-18 NPT with flange connection | | |
| • Sealing screw opposite process connection | | |
| - Mounting thread 7/16-20 UNF to EN 61518 | | 2 |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement) | | 0 |
| • Vent on side of process flange ⁷⁾ | | |
| - Mounting thread 7/16-20 UNF to EN 61518 | | 6 |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement) | | 4 |
| Non-wetted parts materials | | |
| process flange screws | Electronics housing | |
| Stainless steel | Die-cast aluminum | 2 |
| Stainless steel | Stainless steel precision casting ⁸⁾ | 3 |
| Version | | |
| • Standard versions | | 1 |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | | 2 |
| Explosion protection | | |
| • None | | A |
| • With ATEX, Type of protection: | | |
| - "Intrinsic safety (Ex ia)" | | B |
| - "Explosion-proof (Ex d)" ⁹⁾ | | D |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" ¹⁰⁾ | | P |
| - "Ex nA/ic (Zone 2)" ¹¹⁾ | | E |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)" ¹⁰⁾ | | R |
| • FM + CSA intrinsic safe (is) | | F |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | | S |
| • With FM + CSA, Type of protection: | | |
| - "Intrinsic Safe und Explosion Proof (is + xp)" ⁹⁾ | | NC |
| Electrical connection/cable entry | | |
| • Screwed gland Pg 13.5 ¹²⁾ | | A |
| • Screwed gland M20 x 1.5 | | B |
| • Screwed gland 1/2-14 NPT | | C |
| • Han 7D plug (plastic housing) incl. mating connector ¹²⁾ | | D |
| • M12 connectors (stainless steel) ^{12) 13)} | | F |

| Selection and Ordering data | | Article No. |
|---|--|------------------|
| Pressure transmitters for absolute pressure from differential pressure series, SITRANS P DS III with HART | | 7MF4333 - |
| Display | | |
| • Without display | | 0 |
| • Without visible display (display concealed, setting: mA) | | 1 |
| • With visible display | | 6 |
| • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required) | | 7 |
| Power supply units see Chap. 7 "Supplementary Components". | | |
| Included in delivery of the device: | | |
| • Brief instructions (Leporello) | | |
| • CD-ROM with detailed documentation | | |
| • Sealing plug(s) or sealing screw(s) for the process flanges(s) | | |
| 1) For oxygen applications, add Order code E10. | | |
| 2) Version 7MF4333-1DY... only up to max. span 200 mbar a (2.9 psia). | | |
| 3) When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. | | |
| 4) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. | | |
| 5) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF433-..Y-... und 7MF4900-1...-B | | |
| 6) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil. | | |
| 7) Not for span "5.3 ... 100 bar a (76.9 ... 1450 psia)". Position of the top vent valve in the process flange (see dimensional drawing). | | |
| 8) Not in conjunction with Electrical connection "Screwed gland Pg 13.5" and "Han7D plug". | | |
| 9) Without cable gland, with blanking plug | | |
| 10) With enclosed cable gland Ex ia and blanking plug | | |
| 11) Configurations with HAN and M12 connectors are only available in Ex ic. | | |
| 12) Not in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof". | | |
| 13) M12 delivered without cable socket | | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure (from differential pressure series)

| Selection and Ordering data | | Article No. |
|---|------------------------------------|----------------|
| Pressure transmitter for absolute pressure from differential pressure series | | |
| SITRANS P DS III with PROFIBUS PA (PA) | | 7 MF 4 3 3 4 - |
| SITRANS P DS III with FOUNDATION Fieldbus (FF) | | 7 MF 4 3 3 5 - |
| Measuring cell filling | | |
| Silicone oil | normal | 1 |
| Inert liquid ¹⁾ | grease-free to cleanliness level 2 | 3 |
| Nominal measuring range | | |
| 250 mbar a | (3.62 psia) | D |
| 1300 mbar a | (18.85 psia) | F |
| 5 bar a | (72.5 psia) | G |
| 30 bar a | (435 psia) | H |
| 100 bar a | (1450 psia) | KE |
| Wetted parts materials | | |
| Seal diaphragm | Parts of measuring cell | |
| Stainless steel | Stainless steel | A |
| Hastelloy | Stainless steel | B |
| Hastelloy | Hastelloy | C |
| Tantalum | Tantalum | E |
| Monel | Monel | H |
| Gold | Gold | L |
| Version as diaphragm seal ^{2) 3) 4) 5) 6)} | | Y |
| Process connection | | |
| Female thread 1/4-18 NPT with flange connection | | |
| • Sealing screw opposite process connection | | |
| - Mounting thread 7/16"-20 UNF to IEC 61518 | | 2 |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement) | | 0 |
| • Vent on side of process flange ⁷⁾ | | |
| - Mounting thread 7/16"-20 UNF to IEC 61518 | | 6 |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement) | | 4 |
| Non-wetted parts materials | | |
| process flange screws | Electronics housing | |
| Stainless steel | Die-cast aluminum | 2 |
| Stainless steel | Stainless steel precision casting | 3 |
| Version | | |
| • Standard versions | | 1 |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | | 2 |
| Explosion protection | | |
| • None | | A |
| • With ATEX, Type of protection: | | |
| - "Intrinsic safety (Ex ia)" | | B |
| - "Explosion-proof (Ex d)" ⁸⁾ | | D |
| - "Intrinsic safety and flameproof enclosure (Ex ia + Ex d)" ⁹⁾ | | P |
| - "Ex nA/ic (Zone 2)" ¹⁰⁾ | | E |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" ⁹⁾ (not for DS III FF) | | R |
| • FM + CSA intrinsic safe (is) | | F |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | | S |
| • With FM + CSA, Type of protection: | | |
| - "Intrinsic Safe und Explosion Proof (is + xp)" ⁸⁾ | | NC |
| Electrical connection/cable entry | | |
| • Screwed gland M20 x 1.5 | | B |
| • Screwed gland 1/2"-14 NPT | | C |
| • M12 connectors (stainless steel) ^{11) 12) 13)} | | F |

| Selection and Ordering data | | Article No. |
|--|--|----------------|
| Pressure transmitter for absolute pressure from differential pressure series | | |
| SITRANS P DS III with PROFIBUS PA (PA) | | 7 MF 4 3 3 4 - |
| SITRANS P DS III with FOUNDATION Fieldbus (FF) | | 7 MF 4 3 3 5 - |
| Display | | |
| • Without display | | 0 |
| • Without visible display (display concealed, setting: bar) | | 1 |
| • With visible display | | 6 |
| • With customer-specific display (setting as specified, Order code "Y21" required) | | 7 |
| Included in delivery of the device: | | |
| • Brief instructions (Leporello) | | |
| • CD-ROM with detailed documentation | | |
| • Sealing plug(s) or sealing screw(s) for the process flanges(s) | | |
| <ol style="list-style-type: none"> 1) For oxygen application, add Order code E10. 2) Version 7MF4334-1DY... only up to max. span 200 mbar a (80 inH₂O a). 3) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. 4) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. 5) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF433-..Y.-... und 7MF4900-1...-B 6) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil. 7) Not for nominal measuring range 100 bar a (1450 psia). Position of the top vent valve in the process flange (see dimensional drawing). 8) Without cable gland, with blanking plug 9) With enclosed cable gland Ex ia and blanking plug 10) Configurations with HAN and M12 connectors are only available in Ex ic. 11) M12 delivered without cable socket 12) Not available with protection type „Ex d“ (options D, P, N and R) 13) Not in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof". | | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure (from differential pressure series)

1

| Selection and Ordering data | Order code | | |
|--|------------------------|-----------|-----------|
| Further designs Add "-Z" to Article No. and specify Order code. | HART | PA | FF |
| Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of: | | | |
| • Steel | A01 | ✓ | ✓ |
| • Stainless steel | A02 | ✓ | ✓ |
| O-rings for process flanges (instead of FPM (Viton)) | | | |
| • PTFE (Teflon) | A20 | ✓ | ✓ |
| • FEP (with silicone core, approved for food) | A21 | ✓ | ✓ |
| • FPPM (Kalrez, compound 4079) | A22 | ✓ | ✓ |
| • NBR (Buna N) | A23 | ✓ | ✓ |
| plug | | | |
| • Han 7D (metal, gray) | A30 | ✓ | |
| • Han 8U (instead of Han 7D) | A31 | ✓ | |
| • Angled | A32 | ✓ | |
| • Han 8D (metal, gray) | A33 | ✓ | |
| Sealing screw ¼-18 NPT, with valve in mat. of process flanges | A40 | ✓ | ✓ |
| Cable sockets for M12 connectors (stainless steel) | A50 | ✓ | ✓ |
| Rating plate inscription (instead of German) | | | |
| • English | B11 | ✓ | ✓ |
| • French | B12 | ✓ | ✓ |
| • Spanish | B13 | ✓ | ✓ |
| • Italian | B14 | ✓ | ✓ |
| English rating plate Pressure units in inH ₂ O and/or psi | B21 | ✓ | ✓ |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2¹ | C11 | ✓ | ✓ |
| Inspection certificate² Acc. to EN 10204-3.1 | C12 | ✓ | ✓ |
| Factory certificate Acc. to EN 10204-2.2 | C14 | ✓ | ✓ |
| Functional safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | C20 | ✓ | |
| Functional safety (PROFIsafe) Certificate and PROFIsafe protocol | C21³ | | ✓ |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | C23 | ✓ | |
| Device passport Russia (For price request please contact the technical support www.siemens.com/automation/support-request) | C99 | ✓ | ✓ |
| Setting of upper limit of output signal to 22.0 mA | D05 | ✓ | |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel) | D07 | ✓ | ✓ |
| Degree of protection IP65/IP68 (only for M20 x 1.5 and ½-14 NPT) | D12 | ✓ | ✓ |
| Supplied with oval flange (1 item), PTFE packing and screws in thread of process flange | D37 | ✓ | ✓ |

| Selection and Ordering data | Order code | | |
|---|------------------------|-----------|-----------|
| Further designs Add "-Z" to Article No. and specify Order code. | HART | PA | FF |
| Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia")) | E01 | ✓ | ✓ |
| Oxygen application (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F)) | E10 | ✓ | ✓ |
| Export approval Korea | E11 | ✓ | ✓ |
| CRN approval Canada (Canadian Registration Number) | E22 | ✓ | ✓ |
| Dual seal | E24 | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..) | E25⁴ | ✓ | ✓ |
| "Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..) | E26⁴ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..) | E28⁴ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..) | E45⁴ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex id) (only for transmitter 7MF4...-.....-D..) | E46⁴ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..) | E55⁴ | ✓ | ✓ |
| Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..) | E56⁴ | ✓ | ✓ |
| Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..) | E57⁴ | ✓ | ✓ |
| "Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11) | E70⁴ | ✓ | ✓ |
| Two coats of lacquer on casing and cover (PU on epoxy) | G10 | ✓ | ✓ |
| Interchanging of process connection side | H01 | ✓ | ✓ |
| Vent on side for gas measurements | H02 | ✓ | ✓ |
| Transient protector 6 kV (lightning protection) | J01 | ✓ | ✓ |
| Process flange | | | |
| • Hastelloy | K01 | ✓ | ✓ |
| • Monel | K02 | ✓ | ✓ |
| • Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi), max. temperature of medium 90 °C (194 °F) For ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible | K04 | ✓ | ✓ |

¹) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

²) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

³) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

⁴) Option does not include ATEX approval, but instead includes only the country-specific approval.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure
(from differential pressure series)

1

| Selection and Ordering data | Order code | | | |
|--|------------|------|-----------------|----|
| Additional data | | HART | PA | FF |
| Please add "-Z" to Article No. and specify Order code(s) and plain text. | | | | |
| Measuring range to be set Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi | Y01 | ✓ | ✓ ¹⁾ | |
| Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15: | Y15 | ✓ | ✓ | ✓ |
| Measuring point text (entry in device variable) Max. 27 characters, specify in plain text: Y16: | Y16 | ✓ | ✓ | ✓ |
| Entry of HART address (TAG) Max. 8 characters, specify in plain text: Y17: | Y17 | ✓ | | |
| Setting of pressure indication in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ¹⁾ , inH ₂ O ¹⁾ , ftH ₂ O ¹⁾ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or %) ref. temperature 20 °C | Y21 | ✓ | ✓ | ✓ |
| Setting of pressure indication in non-pressure units²⁾ Specify in plain text: Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters) | Y22 + Y01 | ✓ | | |
| Preset bus address possible between 1 and 126 Specify in plain text: Y25: | Y25 | | ✓ | ✓ |
| Damping adjustment in seconds (0 ... 100 s) | Y30 | ✓ | ✓ | ✓ |

Factory mounting of valve manifolds, see accessories.

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

¹⁾ Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

²⁾ Preset values can only be changed over SIMATIC PDM.

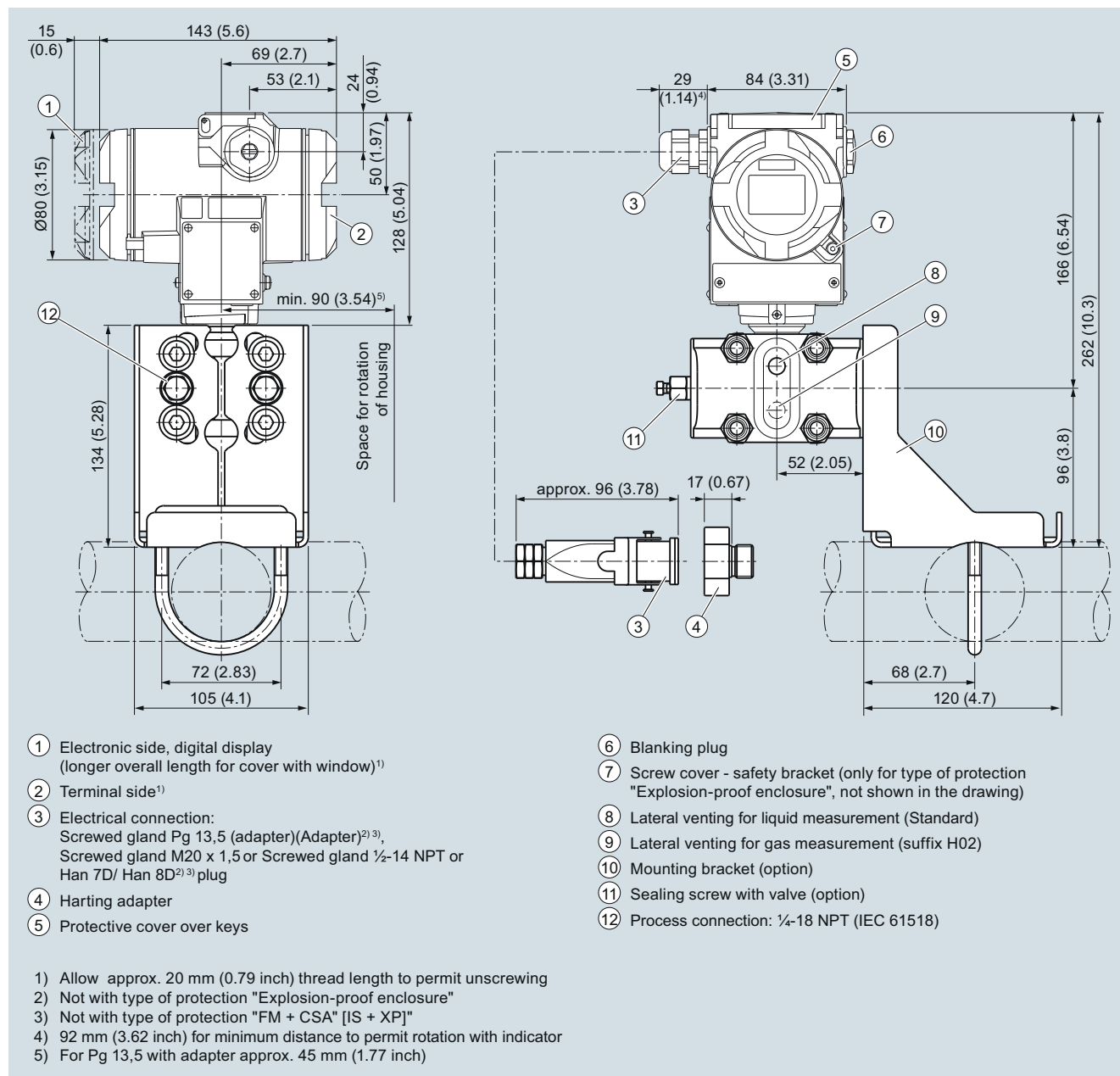
Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for absolute pressure
(from differential pressure series)

1

Dimensional drawings



SITRANS P DS III pressure transmitters for absolute pressure, from the differential pressure series, dimensions in mm (inch)

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
for differential pressure and flow

1

Technical specifications

| SITRANS P, DS III for differential pressure and flow | | | | |
|--|--|--|---------------------------------------|----------------------------|
| | HART | PROFIBUS PA and FOUNDATION Fieldbus | | |
| Input | Differential pressure and flow | | | |
| Measured variable | Differential pressure and flow | | | |
| Spans (infinitely adjustable) or nominal measuring range and max. permissible operating pressure | Span (min. ... max.) | Maximum operating pressure | Nominal measuring range | Maximum operating pressure |
| | 1 ... 20 mbar (0.4 ... 8 inH ₂ O) | 32 bar (464 psi) | 20 mbar (8 inH ₂ O) | 32 bar (464 psi) |
| | 1 ... 60 mbar (0.4 ... 24 inH ₂ O) | 160 bar (2320 psi) | 60 mbar (24 inH ₂ O) | 160 bar (2320 psi) |
| | 2.5 ... 250 mbar (1 ... 100 inH ₂ O) | | 250 mbar (100 inH ₂ O) | |
| | 6 ... 600 mbar (2.4 ... 240 inH ₂ O) | | 600 mbar (240 inH ₂ O) | |
| | 16 ... 1600 mbar (6.4 ... 642 inH ₂ O) | | 1600 mbar (642 inH ₂ O) | |
| | 50 ... 5000 mbar (20 ... 2000 inH ₂ O) | | 5 bar (2000 inH ₂ O) | |
| | 0.3 ... 30 bar (4.35 ... 435 psi) | | 30 bar (435 psi) | |
| | 2.5 ... 250 mbar (1 ... 100 inH ₂ O) | 420 bar (6091 psi) | 250 mbar (100 inH ₂ O) | 420 bar (6091 psi) |
| | 6 ... 600 mbar (2.4 ... 240 inH ₂ O) | | 600 mbar (240 inH ₂ O) | |
| | 16 ... 1600 mbar (6.4 ... 642 inH ₂ O) | | 1600 mbar (642 inH ₂ O) | |
| | 50 ... 5000 mbar (20 ... 2000 inH ₂ O) | | 5 bar (2000 inH ₂ O) | |
| | 0.3 ... 30 bar (4.35 ... 435 psi) | | 30 bar (435 psi) | |
| Lower measuring limit | -100 % of max. span or 30 mbar a (0.44 psia) (-33 % with 30 bar (435 psi) measuring cell) | | | |
| • Measuring cell with silicone oil filling | | | | |
| Upper measuring limit | 100 % of max. span (for oxygen version and inert filling liquid; max. 120 bar (1740 psi)) | | | |
| Output | Digital PROFIBUS PA and FOUNDATION Fieldbus signal | | | |
| Output signal | 4 ... 20 mA | Digital PROFIBUS PA and FOUNDATION Fieldbus signal | | |
| • Lower limit (infinitely adjustable) | 3.55 mA, factory preset to 3.84 mA | - | | |
| • Upper limit (infinitely adjustable) | 23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA | - | | |
| Load | | | | |
| • Without HART | $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V | - | | |
| • With HART | $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator) | - | | |
| Physical bus | - | IEC 61158-2 | | |
| Protection against polarity reversal | Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage. | | | |
| Electrical damping (step width 0.1 s) | Set to 2 s (0 ... 100 s) | | | |
| Measuring accuracy | Acc. to IEC 60770-1 | | | |
| Reference conditions (All error data refer always refer to the set span) | Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span / set span) | | | |
| Error in measurement at limit setting incl. hysteresis and reproducibility | | | | |
| • Linear characteristic | | | | ≤ 0.075 % |
| - r ≤ 10 | ≤ (0.0029 · r + 0.071) % | | | |
| - 10 < r ≤ 30 | ≤ (0.0045 · r + 0.071) % | | | |
| - 30 < r ≤ 100 | ≤ (0.005 · r + 0.05) % | | | |
| • Square-rooted characteristic (flow > 50 %) | | | | ≤ 0.1 % |
| - r ≤ 10 | ≤ 0.1 % | | | |
| - 10 < r ≤ 30 | ≤ 0.2 % | | | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for differential pressure and flow

1

| SITRANS P, DS III for differential pressure and flow | | |
|--|--|---|
| | HART | PROFIBUS PA and FOUNDATION Fieldbus |
| <ul style="list-style-type: none"> • Square-rooted characteristic (flow > 25 ... 50 %) <ul style="list-style-type: none"> - $r \leq 10$ - $10 < r \leq 30$ | <ul style="list-style-type: none"> $\leq 0.2 \%$ $\leq 0.4 \%$ | ≤ 0.2 |
| Long-term stability (temperature change $\pm 30 \text{ °C}$ ($\pm 54 \text{ °F}$)) | $\leq (0.25 \cdot r)\%$ every 5 years static pressure max. 70 bar (1015 psi) | $\leq 0.25 \%$ every 5 years static pressure max. 70 bar (1015 psi) |
| <ul style="list-style-type: none"> • 20 mbar (0.29 psi)-measuring cell • 250, 600, 1600 and 5000 mbar (0.29, 0.87, 2.32 and 7.25 psi) -measuring cell | <ul style="list-style-type: none"> $\leq (0.2 \cdot r)$ per year $\leq (0.125 \cdot r)$ per 5 years | <ul style="list-style-type: none"> ≤ 0.2 per year ≤ 0.125 per 5 years |
| Influence of ambient temperature | | |
| <ul style="list-style-type: none"> • at $-10 \dots +60 \text{ °C}$ ($14 \dots 140 \text{ °F}$) • at $-40 \dots -10 \text{ °C}$ and $60 \dots 85 \text{ °C}$ ($-40 \dots +14 \text{ °F}$ and $140 \dots 185 \text{ °F}$) | <ul style="list-style-type: none"> $\leq (0.08 \cdot r + 0.1) \%^{1)}$ $\leq (0.1 \cdot r + 0.15) \%/10 \text{ K}$ (Twice the value with 20-mbar (0.29 psi) measuring cell) | <ul style="list-style-type: none"> $\leq 0.3 \%$ $\leq 0.25 \%/10 \text{ K}$ |
| Influence of static pressure | | |
| <ul style="list-style-type: none"> • on the zero point (PKN) <ul style="list-style-type: none"> - 20 mbar (0.29 psi)-measuring cell • on the span (PKS) <ul style="list-style-type: none"> - 20 mbar (0.29 psi)-measuring cell | <ul style="list-style-type: none"> $\leq (0.15 \cdot r)\%$ per 70 bar (1015 psi) $\leq (0.15 \cdot r)\%$ per 32 bar (464 psi) $\leq 0.14 \%$ per 70 bar (1015 psi) $\leq 0.2 \%$ per 32 bar (464 psi) | <ul style="list-style-type: none"> $\leq 0.15 \%$ per 70 bar (1015 psi) $\leq 0.15 \%$ per 32 bar (464 psi) - - |
| Measured Value Resolution | - | $3 \cdot 10^{-5}$ of nominal measuring range |
| Rated conditions | | |
| Degree of protection (to EN 60529) | IP65 (optional IP65/IP68) | |
| Temperature of medium | | |
| <ul style="list-style-type: none"> • Measuring cell with silicone oil filling • Measuring cell with inert filling liquid • In conjunction with dust explosion protection | <ul style="list-style-type: none"> $-40 \dots +100 \text{ °C}$ ($-40 \dots +212 \text{ °F}$) $-20 \dots +100 \text{ °C}$ ($-4 \dots +212 \text{ °F}$) with 30 bar measuring cell $-20 \dots +100 \text{ °C}$ ($-4 \dots +212 \text{ °F}$) $-20 \dots +60 \text{ °C}$ ($-4 \dots +140 \text{ °F}$) | |
| Ambient conditions | | |
| <ul style="list-style-type: none"> • Ambient temperature <ul style="list-style-type: none"> - Transmitter (with 4-wire connection, observe temperature values of supplementary 4-wire electronics) - Display readable • Storage temperature • Climatic class <ul style="list-style-type: none"> - Condensation | <ul style="list-style-type: none"> $-40 \dots +85 \text{ °C}$ ($-40 \dots +185 \text{ °F}$) $-30 \dots +85 \text{ °C}$ ($-22 \dots +185 \text{ °F}$) $-50 \dots +85 \text{ °C}$ ($-58 \dots +185 \text{ °F}$) Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics | |
| <ul style="list-style-type: none"> • Electromagnetic Compatibility <ul style="list-style-type: none"> - Emitted interference and interference immunity | Acc. to IEC 61326 and NAMUR NE 21 | |
| Design | | |
| Weight (without options) | $\approx 4.5 \text{ kg}$ ($\approx 9.9 \text{ lb}$) | |
| Enclosure material | Low-copper die-cast aluminum, GD-AlSi12 or stainless steel precision casting, mat. no. 1.4408 | |
| Wetted parts materials | | |
| <ul style="list-style-type: none"> • Seal diaphragm | Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold | |
| Measuring cell filling | Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F)) | |
| Process connection | Female thread $\frac{1}{4}$ -18 NPT and flange connection with mounting thread M10 to DIN 19213 or $\frac{7}{16}$ -20 UNF to IEC 61518 | |
| Material of mounting bracket | | |
| <ul style="list-style-type: none"> • Steel • Stainless steel | <ul style="list-style-type: none"> Sheet-steel, Mat. No. 1.0330, chrome-plated Sheet stainless steel, mat. no. 1.4301 (SS 304) | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
for differential pressure and flow

1

SITRANS P, DS III for differential pressure and flow

| | HART | PROFIBUS PA and FOUNDATION Fieldbus |
|---|--|--|
| Power supply U_H | | Supplied through bus |
| Terminal voltage on transmitter | 10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode | - |
| Separate 24 V power supply necessary | - | No |
| Bus voltage | | |
| • Not Ex | - | 9 ... 32 V |
| • With intrinsically-safe operation | - | 9 ... 24 V |
| Current consumption | | |
| • Basic current (max.) | - | 12.5 mA |
| • Start-up current \leq basic current | - | Yes |
| • Max. current in event of fault | - | 15.5 mA |
| Fault disconnection electronics (FDE) available | - | Yes |
| Certificates and approvals | | |
| Classification according to PED 97/23/EC PN 32/160 (MAWP 464/2320 psi) | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) | |
| PN 420 (MAWP 6092 psi) | For gases of fluid group 1 and liquids of fluid group 1; complies with basic safety 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" | PTB 13 ATEX 2007 X | |
| - Marking | Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6 | |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$ | FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Explosion-proof "d" | PTB 99 ATEX 1160 | |
| - Marking | Ex II 1/2 G Ex d IIC T4/T6 Gb | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6 | |
| - Connection | To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ | To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$ |
| • Dust explosion protection for zone 20 | PTB 01 ATEX 2055 | |
| - Marking | Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) | |
| - Max. surface temperature | 120 °C (248 °F) | |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$ | FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Dust explosion protection for zone 21/22 | PTB 01 ATEX 2055 | |
| - Marking | Ex II 2 D IP65 T 120 °C | |
| - Connection | To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$ | To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$ |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for differential pressure and flow

1

SITRANS P, DS III for differential pressure and flow

| | HART | PROFIBUS PA and FOUNDATION Fieldbus |
|---|--|--|
| • Type of protection "n" (zone 2) | | PTB 13 ATEX 2007 X |
| - Marking | | Ex II 2/3 G Ex nA II T4/T5/T6 Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gc |
| - Connection (Ex nA) | $U_m = 45 \text{ V}$ | $U_m = 32 \text{ V}$ |
| - Connection (Ex ic) | To circuits with values: $U_i = 45 \text{ V}$ | FISCO supply unit ic: $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \text{ } \mu\text{H}$, $C_i = 1,1 \text{ nF}$ |
| • Explosion protection acc. to FM | | Certificate of Compliance 3008490 |
| - Identification (XP/DIP) or (IS); (NI) | | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III |
| • Explosion protection to CSA | | Certificate of Compliance 1153651 |
| - Identification (XP/DIP) or (IS) | | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III |

¹⁾ Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.064 · r + 0.08) % / 28 °C (50 °F).

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
for differential pressure and flow

1

| HART communication | |
|---|--|
| HART | 230 ... 1100 Ω |
| Protocol | HART Version 5.x |
| Software for PC | SIMATIC PDM |
| PROFIBUS PA communication | |
| Simultaneous communication with master class 2 (max.) | 4 |
| The address can be set using | Configuration tool or local operation (standard setting address 126) |
| Cyclic data usage | |
| • Output byte | 5 (one measured value) or 10 (two measured values) |
| • Input byte | 0, 1, or 2 (register operating mode and reset function for metering) |
| Internal preprocessing | |
| Device profile | PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B |
| Function blocks | 2 |
| • Analog input | |
| - Adaptation to customer-specific process variables | Yes, linearly rising or falling characteristic |
| - Electrical damping, adjustable | 0 ... 100 s |
| - Simulation function | Input /Output |
| - Failure mode | parameterizable (last good value, substitute value, incorrect value) |
| - Limit monitoring | Yes, one upper and lower warning limit and one alarm limit respectively |
| • Register (totalizer) | Can be reset, preset, optional direction of counting, simulation function of register output |
| - Failure mode | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |
| - Limit monitoring | One upper and lower warning limit and one alarm limit respectively |
| • Physical block | 1 |
| Transducer blocks | 2 |
| • Pressure transducer block | |
| - Can be calibrated by applying two pressures | Yes |
| - Monitoring of sensor limits | Yes |
| - Specification of a container characteristic with | Max. 30 nodes |
| - Square-rooted characteristic for flow measurement | Yes |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable |
| - Simulation function for measured pressure value and sensor temperature | Constant value or over parameterizable ramp function |

FOUNDATION Fieldbus communication

Function blocks

3 function blocks analog input, 1 function block PID

- Analog input
 - Adaptation to customer-specific process variables
 - Electrical damping, adjustable
 - Simulation function
 - Failure mode
 - Limit monitoring
 - Square-rooted characteristic for flow measurement

Yes, linearly rising or falling characteristic

0 ... 100 s

Output/input (can be locked within the device with a bridge)

parameterizable (last good value, substitute value, incorrect value)

Yes, one upper and lower warning limit and one alarm limit respectively

Yes

- PID

Standard FOUNDATION Fieldbus function block

- Physical block

1 resource block

Transducer blocks

1 transducer block Pressure with calibration, 1 transducer block LCD

- Pressure transducer block

- Can be calibrated by applying two pressures

Yes

- Monitoring of sensor limits

Yes

- Simulation function: Measured pressure value, sensor temperature and electronics temperature

Constant value or over parameterizable ramp function

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for differential pressure and flow

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| Selection and Ordering data | Article No. |
|---|-----------------|
| SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi) | 7MF4433- |
| Measuring cell filling Measuring cell cleaning | |
| Silicone oil normal | ▶ ◆ 1 |
| Inert liquid ¹⁾ grease-free to cleanliness level 2 | ▶ ◆ 3 |
| Measuring span (min. ... max.) | |
| PN 32 (MAWP 464 psi) | |
| 1 ... 20 mbar ²⁾ (0.4015 ... 8.03 inH ₂ O) | ▶ ◆ B |
| PN 160 (MAWP 2320 psi) | |
| 1 ... 60 mbar (0.4015 ... 24.09 inH ₂ O) | ▶ ◆ C |
| 2,5 ... 250 mbar (1.004 ... 100.4 inH ₂ O) | ▶ ◆ D |
| 6 ... 600 mbar (2.409 ... 240.9 inH ₂ O) | ▶ ◆ E |
| 16 ... 1600 mbar (6.424 ... 642.4 inH ₂ O) | ▶ ◆ F |
| 50 ... 5000 mbar (20.08 ... 2008 inH ₂ O) | ▶ ◆ G |
| 0,3 ... 30 bar (4.35 ... 435 psi) | ▶ ◆ H |
| Wetted parts materials (stainless steel process flanges) | |
| Seal diaphragm Parts of measuring cell | |
| Stainless steel Stainless steel | ▶ ◆ A |
| Hastelloy Stainless steel | ▶ ◆ B |
| Hastelloy Hastelloy | ▶ ◆ C |
| Tantalum ³⁾ Tantalum | ▶ ◆ E |
| Monel ³⁾ Monel | ▶ ◆ H |
| Gold ³⁾ Gold | ▶ ◆ L |
| Version for diaphragm seal ^{4) 5) 6) 7)} | ▶ ◆ Y |
| Process connection | |
| Female thread 1/4-18 NPT with flange connection | |
| • Sealing screw opposite process connection | |
| - Mounting thread 7/16-20 UNF to IEC 61518 | ▶ ◆ 2 |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement) | ◆ 0 |
| • Vent on side of process flange ²⁾ | |
| - Mounting thread 7/16-20 UNF to IEC 61518 | ▶ ◆ 6 |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement) | ▶ ◆ 4 |
| Non-wetted parts materials | |
| process flange screws Electronics housing | |
| Stainless steel Die-cast aluminum | ▶ ◆ 2 |
| Stainless steel Stainless steel precision casting ⁸⁾ | ▶ ◆ 3 |
| Version | |
| • Standard versions | ◆ 1 |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | ▶ ◆ 2 |
| Explosion protection | |
| • None | ◆ A |
| • With ATEX, Type of protection: | |
| - "Intrinsic safety (Ex ia)" | ◆ B |
| - "Explosion-proof (Ex d) ⁹⁾ " | ◆ D |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) ¹⁰⁾ | ◆ P |
| - "Ex nA/ic (Zone 2) ¹¹⁾ " | ◆ E |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D) ¹⁰⁾ " | ▶ ◆ R |
| • FM + CSA intrinsic safe (is) | ◆ F |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | ◆ S |
| • With FM + CSA, Type of protection: | |
| - "Intrinsic Safe und Explosion Proof (is + xp) ⁹⁾ " | ◆ NC |

| Selection and Ordering data | Article No. |
|---|-----------------|
| SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi) | 7MF4433- |
| Electrical connection/cable entry | |
| • Screwed gland Pg 13.5 ¹²⁾ | ▶ ◆ A |
| • Screwed gland M20 x 1.5 | ▶ ◆ B |
| • Screwed gland 1/2-14 NPT | ◆ C |
| • Han 7D plug (plastic housing) incl. mating connector ¹²⁾¹³⁾ | ◆ D |
| • M12 connectors (stainless steel) ^{12) 14)} | ◆ F |
| Display | |
| • Without display | ◆ 0 |
| • Without visible display (display concealed, setting: mA) | ▶ ◆ 1 |
| • With visible display | ◆ 6 |
| • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required) | ◆ 7 |
| ▶ Available ex stock | |
| ◆ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ◆. For details see page 9/5 in the appendix. | |
| Power supply units see Chap. 7 "Supplementary Components". | |
| Included in delivery of the device: | |
| • Brief instructions (Leporello) | |
| • CD-ROM with detailed documentation | |
| • Sealing plug(s) or sealing screw(s) for the process flanges(s) | |
| 1) For oxygen application, add Order code E10. | |
| 2) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing). | |
| 3) Not in conjunction with max. span 20 and 60 mbar (8.03 und 24.09 inH ₂ O) | |
| 4) When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. | |
| 5) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. | |
| 6) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443-..Y-.... und 7MF4900-1...-B | |
| 7) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil. | |
| 8) Not in conjunction with Electrical connection "Screwed gland Pg 13.5" and "Han7D plug". | |
| 9) Without cable gland, with blanking plug | |
| 10) With enclosed cable gland Ex ia and blanking plug | |
| 11) Configurations with HAN and M12 connectors are only available in Ex ic. | |
| 12) Not in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof". | |
| 13) Permissible only for crimp-contact of conductor cross-section 1 mm ² | |
| 14) M12 delivered without cable socket. Not available with protection type "Explosion-proof". | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for differential pressure and flow

1

| Selection and Ordering data | | Article No. |
|---|------------------------------------|-----------------------|
| Pressure transmitters for differential pressure and flow PN 32/160 (MAWP 464/2320 psi) | | |
| SITRANS P DS III with PROFIBUS PA (PA) | | 7 MF 4 4 3 4 - |
| SITRANS P DS III with FOUNDATION Fieldbus (FF) | | 7 MF 4 4 3 5 - |
| | | ■ ■ ■ ■ ■ - ■ ■ ■ ■ ■ |
| Measuring cell filling | Measuring cell cleaning | |
| Silicone oil | normal | 1 |
| Inert liquid ¹⁾ | grease-free to cleanliness level 2 | 3 |
| Nominal measuring range | | |
| PN 32 (MAWP 464 psi) | | |
| 20 mbar ²⁾ | (8.03 inH ₂ O) | B |
| PN 160 (MAWP 2320 psi) | | |
| 60 mbar | (24.09 inH ₂ O) | C |
| 250 mbar | (100.4 inH ₂ O) | D |
| 600 mbar | (240.9 inH ₂ O) | E |
| 1600 mbar | (642.4 inH ₂ O) | F |
| 5 bar | (2008 inH ₂ O) | G |
| 30 bar | (435 psi) | H |
| Wetted parts materials | | |
| (stainless steel process flanges) | | |
| Seal diaphragm | Parts of measuring cell | |
| Stainless steel | Stainless steel | A |
| Hastelloy | Stainless steel | B |
| Hastelloy | Hastelloy | C |
| Tantalum ³⁾ | Tantalum | E |
| Monel ³⁾ | Monel | H |
| Gold ³⁾ | Gold | L |
| Version as diaphragm seal ^{4) 5) 6) 7)} | | Y |
| Process connection | | |
| Female thread 1/4-18 NPT with flange connection | | |
| • Sealing screw opposite process connection | | |
| - Mounting thread 7/16-20 UNF to IEC 61518 | | 2 |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement) | | 0 |
| • Venting on side of process flanges ²⁾ | | |
| - Mounting thread 7/16-20 UNF to IEC 61518 | | 6 |
| - Mounting thread M10 to DIN 19213 (only for replacement requirement) | | 4 |
| Non-wetted parts materials | | |
| process flange screws | Electronics housing | |
| Stainless steel | Die-cast aluminum | 2 |
| Stainless steel | Stainless steel precision casting | 3 |
| Version | | |
| • Standard versions | | 1 |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | | 2 |
| Explosion protection | | |
| • None | | A |
| • With ATEX, Type of protection: | | |
| - "Intrinsic safety (Ex ia)" | | B |
| - "Explosion-proof (Ex d)" ⁸⁾ | | D |
| - "Intrinsic safety and flameproof enclosure (Ex ia + Ex d)" ⁹⁾ | | P |
| - "Ex nA/ic (Zone 2)" ¹⁰⁾ | | E |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" ⁹⁾ (not for DS III FF) | | R |
| • FM + CSA intrinsic safe (is) | | F |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | | S |
| • With FM + CSA, Type of protection: | | |
| - "Intrinsic Safe und Explosion Proof (is + xp)" ⁸⁾ | | NC |

| Selection and Ordering data | | Article No. |
|--|--|-----------------------|
| Pressure transmitters for differential pressure and flow PN 32/160 (MAWP 464/2320 psi) | | |
| SITRANS P DS III with PROFIBUS PA (PA) | | 7 MF 4 4 3 4 - |
| SITRANS P DS III with FOUNDATION Fieldbus (FF) | | 7 MF 4 4 3 5 - |
| | | ■ ■ ■ ■ ■ - ■ ■ ■ ■ ■ |
| Electrical connection/cable entry | | |
| • Screwed gland M20 x 1.5 | | B |
| • Screwed gland 1/2-14 NPT | | C |
| • M12 connectors (stainless steel) ^{11) 12) 13)} | | F |
| Display | | |
| • Without display | | 0 |
| • Without visible display (display concealed, setting: bar) | | 1 |
| • With visible display | | 6 |
| • With customer-specific display (setting as specified, Order code "Y21" required) | | 7 |
| Included in delivery of the device: | | |
| • Brief instructions (Leporello) | | |
| • CD-ROM with detailed documentation | | |
| • Sealing plug(s) or sealing screw(s) for the process flanges(s) | | |
| 1) For oxygen application, add Order code E10. | | |
| 2) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing). | | |
| 3) Not in conjunction with max. span 20 and 60 mbar (8.03 und 24.09 inH ₂ O) | | |
| 4) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. | | |
| 5) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. | | |
| 6) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443-...Y...-... und 7MF4900-1...-B | | |
| 7) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil. | | |
| 8) Without cable gland, with blanking plug. | | |
| 9) With enclosed cable gland Ex ia and blanking plug. | | |
| 10) Configurations with HAN and M12 connectors are only available in Ex ic. | | |
| 11) M12 delivered without cable socket | | |
| 12) Not available with protection type „Ex d“ (options D, P, N and R) | | |
| 13) Not in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof". | | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for differential pressure and flow

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| Selection and Ordering data | Order code | | | |
|--|-------------------|------|----|----|
| Further designs Add "-Z" to Article No. and specify Order code. | | HART | PA | FF |
| Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of: | | | | |
| • Steel | ● A01 | ✓ | ✓ | ✓ |
| • Stainless steel | ● A02 | ✓ | ✓ | ✓ |
| O-rings for process flanges (instead of FPM (Viton)) | | | | |
| • PTFE (Teflon) | ● A20 | ✓ | ✓ | ✓ |
| • FEP (with silicone core, approved for food) | A21 | ✓ | ✓ | ✓ |
| • FPM (Kalrez, compound 4079) | A22 | ✓ | ✓ | ✓ |
| • NBR (Buna N) | A23 | ✓ | ✓ | ✓ |
| plug | | | | |
| • Han 7D (metal, gray) | A30 | ✓ | | |
| • Han 8U (instead of Han 7D) | A31 | ✓ | | |
| • Angled | A32 | ✓ | | |
| • Han 8D (metal, gray) | A33 | ✓ | | |
| Sealing screws (2 unit(s)) ¼-18 NPT, with valve in mat. of process flanges | ● A40 | ✓ | ✓ | ✓ |
| Cable sockets for M12 connectors (stainless steel) | A50 | ✓ | ✓ | ✓ |
| Rating plate inscription (instead of German) | | | | |
| • English | ● B11 | ✓ | ✓ | ✓ |
| • French | ● B12 | ✓ | ✓ | ✓ |
| • Spanish | ● B13 | ✓ | ✓ | ✓ |
| • Italian | ● B14 | ✓ | ✓ | ✓ |
| English rating plate Pressure units in inH ₂ O and/or psi | ● B21 | ✓ | ✓ | ✓ |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2¹⁾ | ● C11 | ✓ | ✓ | ✓ |
| Inspection certificate²⁾ to EN 10204-3.1 | ● C12 | ✓ | ✓ | ✓ |
| Factory certificate to EN 10204-2.2 | ● C14 | ✓ | ✓ | ✓ |
| Functional safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | ● C20 | ✓ | | |
| Functional safety (PROFIsafe) Certificate and PROFIsafe protocol | C21 ⁵⁾ | | ✓ | |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | ● C23 | ✓ | | |
| Device passport Russia (For price request please contact the technical support www.siemens.com/automation/support-request) | C99 | ✓ | ✓ | ✓ |
| Setting of upper limit of output signal to 22.0 mA | D05 | ✓ | | |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel) | D07 | ✓ | ✓ | ✓ |
| Degree of protection IP65/IP68 (only for M20 x 1.5 and ½-14 NPT) | D12 | ✓ | ✓ | ✓ |
| Process flange screws made of Monel (max. nominal pressure PN20) | D34 | ✓ | ✓ | ✓ |
| Supplied with oval flange set (2 items), PTFE packings and screws in thread of process flanges | D37 | ✓ | ✓ | ✓ |

| Selection and Ordering data | Order code | | | |
|--|-------------------|------|----|----|
| Further designs Add "-Z" to Article No. and specify Order code. | | HART | PA | FF |
| Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia ⁴⁾) | E01 | ✓ | ✓ | ✓ |
| TÜV approval to AD/TRD (only together with type of protection "Intrinsic safety (Ex ia ⁴⁾ ") | E06 | ✓ | | |
| Overfilling safety device for flammable and non-flammable liquids (max. PN 32 (MAWP 464 psi), basic device with type of protection "Intrinsic safety (Ex ia ⁴⁾ ", to WHG and VbF, not together with measuring cell filling "inert liquid ⁴⁾ ") | E08 | ✓ | | |
| Oxygen application (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F)) | E10 | ✓ | ✓ | ✓ |
| Export approval Korea | E11 | ✓ | ✓ | ✓ |
| CRN approval Canada (Canadian Registration Number) | E22 | ✓ | ✓ | ✓ |
| Dual seal | E24 | ✓ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..) | E25 ⁴⁾ | ✓ | ✓ | ✓ |
| "Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..) | E26 ⁴⁾ | ✓ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..) | E28 ⁴⁾ | ✓ | ✓ | |
| Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..) | E45 ⁴⁾ | ✓ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex id) (only for transmitter 7MF4...-.....-D..) | E46 ⁴⁾ | ✓ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..) | E55 ⁴⁾ | ✓ | ✓ | ✓ |
| Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..) | E56 ⁴⁾ | ✓ | ✓ | ✓ |
| Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..) | E57 ⁴⁾ | ✓ | ✓ | ✓ |
| "Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11) | E70 ⁴⁾ | ✓ | ✓ | ✓ |
| Two coats of lacquer on casing and cover (PU on epoxy) | G10 | ✓ | ✓ | ✓ |
| Interchanging of process connection side | H01 | ✓ | ✓ | ✓ |
| Vent on side for gas measurements | H02 | ✓ | ✓ | ✓ |
| Stainless steel process flanges for vertical differential pressure lines (not together with K01, K02 and K04) ³⁾ | H03 | ✓ | ✓ | ✓ |

● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 9/5 in the appendix.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
for differential pressure and flow

1

| Selection and Ordering data | Order code | | |
|---|------------|---|---|
| Further designs Add "-Z" to Article No. and specify Order code. | | | |
| Process flange | | | |
| • Hastelloy | K01 | ✓ | ✓ |
| • Monel | K02 | ✓ | ✓ |
| • Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi), max. temperature of medium 90 °C (194 °F) For ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible | K04 | ✓ | ✓ |

Factory mounting of valve manifolds, see accessories.

Supplementary electronics for 4-wire connection, see accessories.

✓ = available

- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- Not suitable for connection of remote seal
- Option does not include ATEX approval, but instead includes only the country-specific approval.
- Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

| Selection and Ordering data | Order code | | |
|--|--|---|-----------------|
| Additional data Please add "-Z" to Article No. and specify Order code(s) and plain text. | | | |
| Measuring range to be set Specify in plain text: | | | |
| • in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi | Y01 | ✓ | ✓ ¹⁾ |
| • in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi | Y02 | ✓ | |
| Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15: | Y15 | ✓ | ✓ |
| Measuring point text (entry in device variable) Max. 27 char., specify in plain text: Y16: | Y16 | ✓ | ✓ |
| Entry of HART address (TAG) Max. 8 char., specify in plain text: Y17: | Y17 | ✓ | |
| Setting of pressure indicator in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ^{*)} , inH ₂ O ^{*)} , ftH ₂ O ^{*)} , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or %) ref. temperature 20 °C | Y21 | ✓ | ✓ |
| Setting of pressure indicator in non-pressure units²⁾ Specify in plain text: Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters) | Y22 ³⁾ + Y01 or Y02 | ✓ | |
| Preset bus address possible between 1 and 126 Specify in plain text: Y25: | Y25 | | ✓ |
| Damping adjustment in seconds (0 ... 100 s) | Y30 | ✓ | ✓ |

- We can offer shorter delivery times for configurations designated with the Quick Ship Symbol •. For details see page 9/5 in the appendix.

Factory mounting of valve manifolds, see accessories.

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 und D05 can be factory preset

✓ = available

- Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.
- Preset values can only be changed over SIMATIC PDM.
- Not in conjunction with over-filling safety device for flammable and non-flammable liquids (Order code "E08")

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for differential pressure and flow

1

| Selection and Ordering data | | Article No. |
|--|---|-----------------|
| SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi) | | 7MF4533- |
| Measuring cell filling | Measuring cell cleaning | |
| Silicone oil | normal | 1 |
| Measuring span (min. ... max.) | | |
| 2.5 ... 250 mbar | (1.004 ... 100.4 inH ₂ O) | D |
| 6 ... 600 mbar | (2.409 ... 240.9 inH ₂ O) | E |
| 16 ... 1600 mbar | (6.424 ... 642.4 inH ₂ O) | F |
| 50 ... 5000 mbar | (20.08 ... 2008 inH ₂ O) | G |
| 0.3 ... 30 bar | (4.35 ... 435 psi) | H |
| Wetted parts materials (stainless steel process flanges) | | |
| Seal diaphragm | Parts of measuring cell | |
| Stainless steel | Stainless steel | A |
| Hastelloy | Stainless steel | B |
| Gold ¹⁾ | Gold | L |
| Ausführung als Membrandruckmittler ^{2) 3) 4) 5)} | | Y |
| Process connection | | |
| Female thread 1/4-18 NPT with flange connection | | |
| • Sealing screw opposite process connection | | |
| - Mounting thread 7/16-20 UNF to IEC 61518 | | 3 |
| - Mounting thread M12 to DIN 19213 (only for replacement requirement) | | 1 |
| • Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing) | | |
| - Mounting thread 7/16-20 UNF to IEC 61518 | | 7 |
| - Mounting thread M12 to DIN 19213 (only for replacement requirement) | | 5 |
| Non-wetted parts materials | | |
| process flange screws | Electronics housing | |
| Stainless steel | Die-cast aluminum | 2 |
| Stainless steel | Stainless steel precision casting ⁶⁾ | 3 |
| Version | | |
| • Standard versions | | 1 |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | | 2 |
| Explosion protection | | |
| • None | | A |
| • With ATEX, Type of protection: | | |
| - "Intrinsic safety (Ex ia)" | | B |
| - "Explosion-proof (Ex d)" ⁷⁾ | | P |
| - "Intrinsic safety and flameproof enclosure (Ex ia + Ex d)" ⁸⁾ | | D |
| - "Ex nA/ic (Zone 2)" ⁹⁾ | | E |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)" ⁸⁾ | | R |
| • FM + CSA intrinsic safe (is) | | F |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | | S |
| • With FM + CSA, Type of protection: | | |
| - "Intrinsic safety and explosion-proof (is + xp)" ⁷⁾ , max PN 360 | | NC |
| Electrical connection/cable entry | | |
| • Screwed gland Pg 13.5 ¹⁰⁾ | | A |
| • Screwed gland M20x1.5 | | B |
| • Screwed gland 1/2-14 NPT | | C |
| • Han 7D plug (plastic housing) incl. mating connector ¹⁰⁾¹¹⁾ | | D |
| • M12 connectors (stainless steel) ^{12) 13) 14)} | | F |

| Selection and Ordering data | | Article No. |
|---|--|-----------------|
| SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi) | | 7MF4533- |
| Display | | |
| • Without display | | 0 |
| • Without visible display (display concealed, setting: mA) | | 1 |
| • With visible display | | 6 |
| • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required) | | 7 |
| Power supply units see Chap. 7 "Supplementary Components". | | |
| Scope of delivery: Pressure transmitter as ordered (Instruction Manual is extra ordering item) | | |
| 1) Not in conjunction with max. span 600 mbar (240.9 inH ₂ O) | | |
| 2) When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. | | |
| 3) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. | | |
| 4) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF453-.-.Y.-.-.-.- und 7MF4900-1.-.-.-.-B | | |
| 5) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil. | | |
| 6) Not in conjunction with Electrical connection "Screwed gland Pg 13.5" and "Han7D plug". | | |
| 7) Without cable gland, with blanking plug | | |
| 8) With enclosed cable gland Ex ia and blanking plug | | |
| 9) Configurations with HAN and M12 connectors are only available in Ex ic. | | |
| 10) Not in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof". | | |
| 11) Permissible only for crimp-contact of conductor cross-section 1 mm ² | | |
| 12) M12 delivered without cable socket | | |
| 13) Not available with protection type „Ex d“ (options D, P, N and R) | | |
| 14) Not in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof". | | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
 for differential pressure and flow

1

| Selection and Ordering data | Article No. | Selection and Ordering data | Article No. |
|---|----------------|--|----------------|
| Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi) | | Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi) | |
| SITRANS P DS III with PROFIBUS PA (PA) | 7 MF 4 5 3 4 - | SITRANS P DS III with PROFIBUS PA (PA) | 7 MF 4 5 3 4 - |
| SITRANS P DS III with FOUNDATION Fieldbus (FF) | 7 MF 4 5 3 5 - | SITRANS P DS III with FOUNDATION Fieldbus (FF) | 7 MF 4 5 3 5 - |
| | 1 ■■■■ - ■■■■ | | 1 ■■■■ - ■■■■ |
| Nominal measuring range | | Display | |
| 250 mbar (100.4 inH ₂ O) | D | • Without (display hidden) | 0 |
| 600 mbar (240.9 inH ₂ O) | E | • Without visible display (display concealed, setting: bar) | 1 |
| 1600 mbar (642.4 inH ₂ O) | F | • With visible display | 6 |
| 5 bar (2008 inH ₂ O) | G | • With customer-specific display (setting as specified, Order code "Y21" required) | 7 |
| 30 bar (435 psi) | H | | |
| Wetted parts materials | | Included in delivery of the device: | |
| (stainless steel process flanges) | | • Brief instructions (Leporello) | |
| Seal diaphragm Parts of measuring cell | | • CD-ROM with detailed documentation | |
| Stainless steel Stainless steel | A | • Sealing plug(s) or sealing screw(s) for the process flanges(s) | |
| Hastelloy Stainless steel | B | | |
| Gold ¹⁾ Gold | L | | |
| Ausführung als Membrandruckmittler ^{2) 3) 4) 5)} | Y | | |
| Process connection | | 1) Not in conjunction with max. span 600 mbar (240.9 inH ₂ O) | |
| Female thread 1/4-18 NPT with flange connection | | 2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. | |
| • Sealing screw opposite process connection | | 3) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. | |
| - Mounting thread 7/16-20 UNF to IEC 61518 | 3 | 4) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF453-...Y... und 7MF4900-1...-B | |
| - Mounting thread M12 to DIN 19213 (only for replacement requirement) | 1 | 5) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil. | |
| • Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing). | | 6) Without cable gland, with blanking plug. | |
| - Mounting thread 7/16-20 UNF to IEC 61518 | 7 | 7) With enclosed cable gland Ex ia and blanking plug. | |
| - Mounting thread M12 to DIN 19213 (only for replacement requirement) | 5 | 8) Configurations with HAN and M12 connectors are only available in Ex ic. | |
| Non-wetted parts materials | | 9) M12 delivered without cable socket | |
| Process flange screws Electronics housing | | ¹⁰⁾ Not available with protection type „Ex d“ (options D, P, N and R) | |
| Stainless steel Die-cast aluminum | 2 | ¹¹⁾ Not in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof". | |
| Stainless steel Stainless steel precision casting | 3 | | |
| Version | | | |
| • Standard versions | 1 | | |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | 2 | | |
| Explosion protection | | | |
| • None | A | | |
| • With ATEX, Type of protection: | | | |
| - "Intrinsic safety (Ex ia)" | B | | |
| - "Explosion-proof (Ex d)" ⁶⁾ | D | | |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" ⁷⁾ | P | | |
| - "Ex nA/ic (Zone 2)" ⁸⁾ | E | | |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" ⁷⁾ (not for DS III FF) | R | | |
| • FM + CSA intrinsic safe (is) | F | | |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | S | | |
| • With FM + CSA, Type of protection: | | | |
| - "Intrinsic safety and explosion-proof (is + xp)" ⁶⁾ , max PN 360 | NC | | |
| Electrical connection/cable entry | | | |
| • Screwed gland M20 x 1.5 | B | | |
| • Screwed gland 1/2-14 NPT | C | | |
| • M12 connectors (stainless steel) ^{9) 10) 11)} | F | | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for differential pressure and flow

1

| Selection and Ordering data | Order code | | |
|--|-------------------|----|----|
| <i>Further designs</i> | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code. | | | |
| Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of: | | | |
| • Steel | A01 | ✓ | ✓ |
| • Stainless steel | A02 | ✓ | ✓ |
| O-rings for process flanges (instead of FPM (Viton)) | | | |
| • PTFE (Teflon) | A20 | ✓ | ✓ |
| • FEP (with silicone core, approved for food) | A21 | ✓ | ✓ |
| • FFFM (Kalrez, compound 4079) | A22 | ✓ | ✓ |
| • NBR (Buna N) | A23 | ✓ | ✓ |
| Plug | | | |
| • Han 7D (metal, gray) | A30 | ✓ | |
| • Han 8U (instead of Han 7D) | A31 | ✓ | |
| • Angled | A32 | ✓ | |
| • Han 8D (metal, gray) | A33 | ✓ | |
| Sealing screws (2 unit(s)) | A40 | ✓ | ✓ |
| ¼-18 NPT, with valve in mat. of process flanges | | | |
| Cable sockets for M12 conn. (stainless steel) | A50 | ✓ | ✓ |
| Rating plate inscription (instead of German) | | | |
| • English | B11 | ✓ | ✓ |
| • French | B12 | ✓ | ✓ |
| • Spanish | B13 | ✓ | ✓ |
| • Italian | B14 | ✓ | ✓ |
| English rating plate | B21 | ✓ | ✓ |
| Pressure units in inH ₂ O and/or psi | | | |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2 | C11 | ✓ | ✓ |
| Inspection certificate | C12 | ✓ | ✓ |
| Acc. to EN 10204-3.1 | | | |
| Factory certificate | C14 | ✓ | ✓ |
| Acc. to EN 10204-2.2 | | | |
| Functional safety (SIL2) | C20 | ✓ | |
| Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | | | |
| Functional safety (PROFIsafe) Certificate and PROFIsafe protocol | C21 ¹⁾ | ✓ | |
| Functional safety (SIL2/3) | C23 | ✓ | |
| Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | | | |
| Device passport Russia (For price request please contact the technical support www.siemens.com/automation/support-request) | C99 | ✓ | ✓ |
| Setting of upper limit of output signal to 22.0 mA | D05 | ✓ | |
| Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel) | D07 | ✓ | ✓ |
| Degree of protection IP65/IP68 (only for M20 x 1.5 and ½-14 NPT) | D12 | ✓ | ✓ |
| Nom. press. rating PN 500 (MAWP 7250 psi) (Only for measuring cell 600 mbar ... 30 bar (240 inH ₂ O ... 435 psi), SIL- und Ex-options not possible) ²⁾ | D56 | ✓ | |

| Selection and Ordering data | Order code | | |
|--|-------------------|----|----|
| <i>Further designs</i> | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code. | | | |
| Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia)) | E01 | ✓ | ✓ |
| Export approval Korea | E11 | ✓ | ✓ |
| Dual seal | E24 | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..) | E25 ³⁾ | ✓ | ✓ |
| "Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..) | E26 ³⁾ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..) | E28 ³⁾ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..) | E45 ³⁾ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex id) (only for transmitter 7MF4...-.....-D..) | E46 ³⁾ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..) | E55 ³⁾ | ✓ | ✓ |
| Ex prot. "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..) | E56 ³⁾ | ✓ | ✓ |
| Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..) | E57 ³⁾ | ✓ | ✓ |
| "Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]...-Z + E11) | E70 ³⁾ | ✓ | ✓ |
| Two coats of lacquer on casing and cover (PU on epoxy) | G10 | ✓ | ✓ |
| Interchanging of process connection side | H01 | ✓ | ✓ |
| Stainless steel process flanges for vertical differential pressure lines | H03 | ✓ | ✓ |
| Transient protector 6 kV (lightning protection) | J01 | ✓ | ✓ |

¹⁾ Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

²⁾ Tested according to IEC 61010. Only for measuring materials of the group of fluids 2 in accordance with PED permissible. Not for use with dangerous media suitable.

³⁾ Option does not include ATEX approval, but instead includes only the country-specific approval.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
for differential pressure and flow

1

| Selection and Ordering data | Order code | | |
|--|------------------------|----|-----------------|
| Additional data | HART | PA | FF |
| Please add "-Z" to Article No. and specify Order code(s) and plain text. | | | |
| Measuring range to be set Specify in plain text: | | | |
| • in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi | Y01 | ✓ | ✓ ¹⁾ |
| • in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi | Y02 | ✓ | |
| Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15: | Y15 | ✓ | ✓ |
| Measuring point text (entry in device variable) Max. 27 char., specify in plain text: Y16: | Y16 | ✓ | ✓ |
| Entry of HART address (TAG) Max. 8 char., specify in plain text: Y17: | Y17 | ✓ | |
| Setting of pressure indication in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ¹⁾ , inH ₂ O ¹⁾ , ftH ₂ O ¹⁾ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or %) ref. temperature 20 °C | Y21 | ✓ | ✓ |
| Setting of pressure indication in non-pressure units²⁾ Specify in plain text: Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters) | Y22 + Y01 or Y02 | ✓ | |
| Preset bus address possible between 1 and 126 Specify in plain text: Y25: | Y25 | | ✓ |
| Damping adjustment in seconds (0 ... 100 s) Factory mounting of valve manifolds, see accessories. Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset. ✓ = available | Y30 | ✓ | ✓ |

¹⁾ Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

²⁾ Preset values can only be changed over SIMATIC PDM.

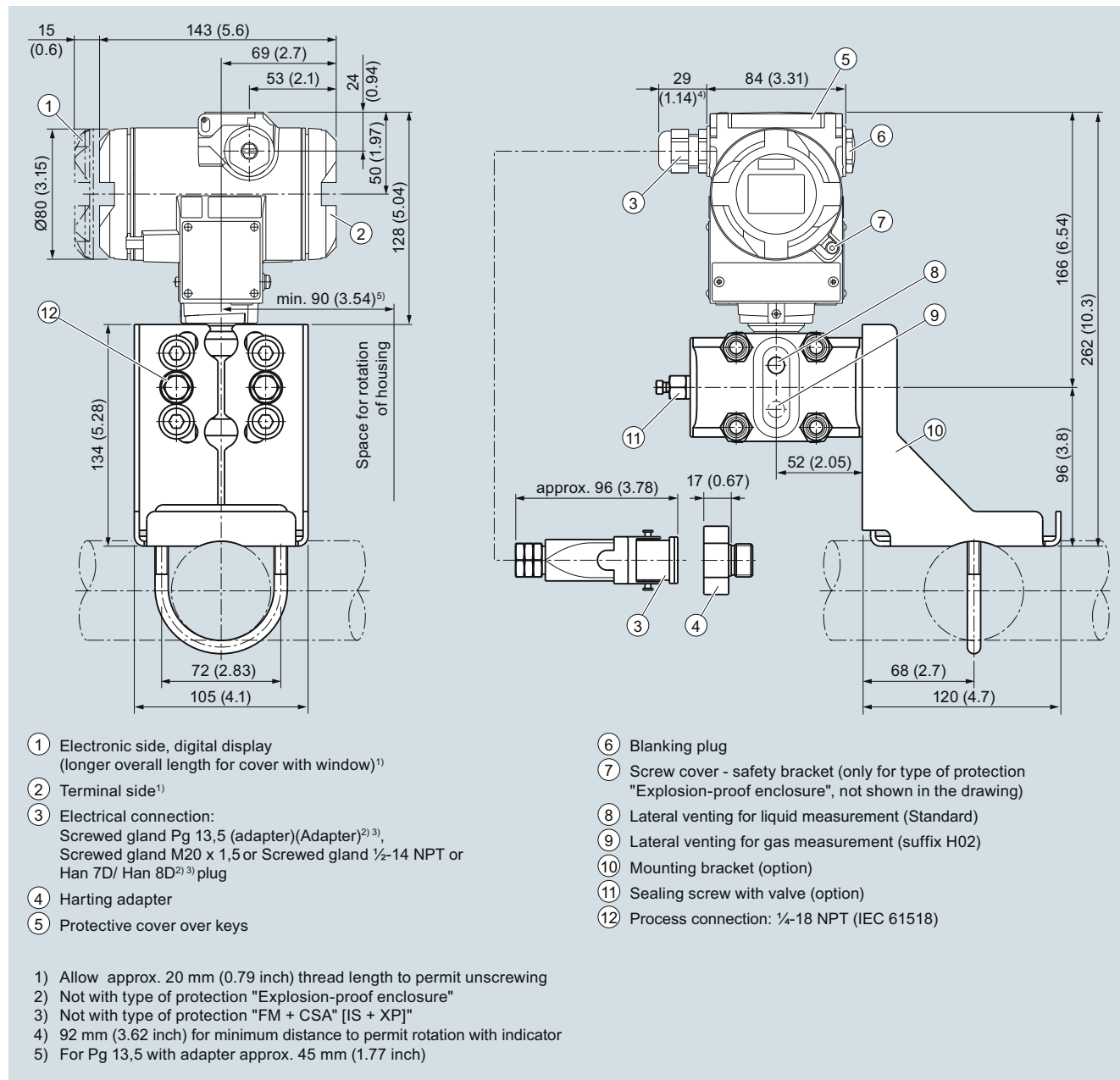
Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
for differential pressure and flow

1

Dimensional drawings



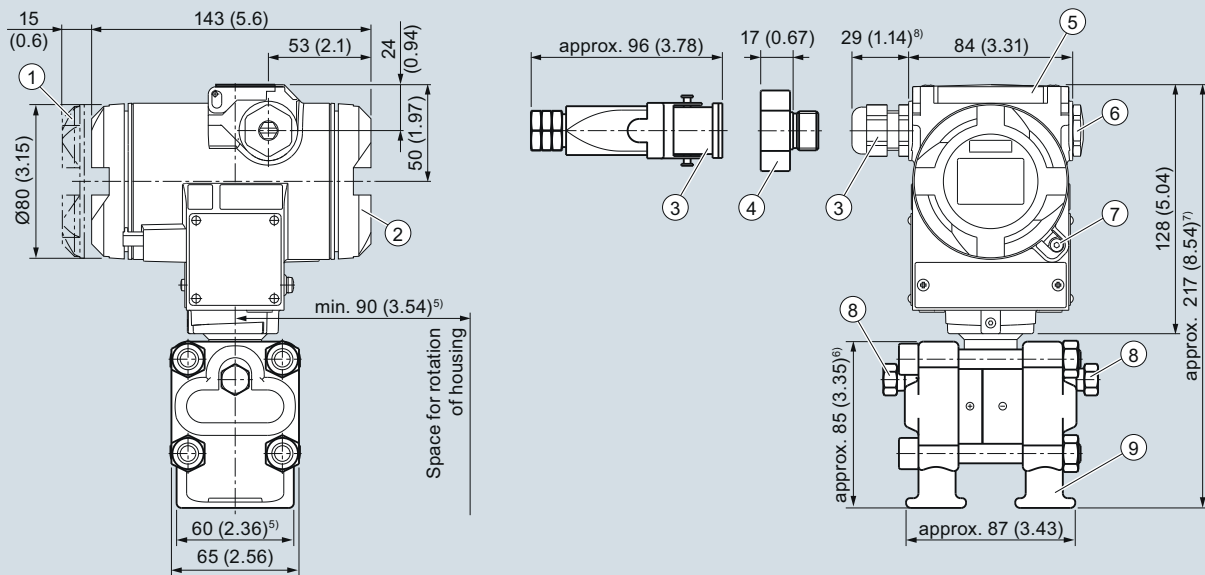
SITRANS P DS III pressure transmitters for differential pressure and flow, dimensions in mm (inch)

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
for differential pressure and flow

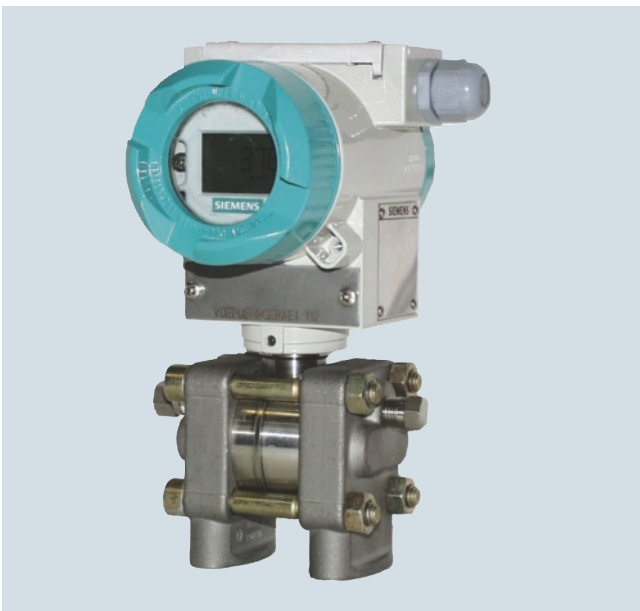
1



- ① Electronic side, digital display (longer overall length for cover with window)¹⁾
- ② Terminal side¹⁾
- ③ Electrical connection: Screwed gland Pg 13,5 (adapter)(Adapter)^{2) 3)}, Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/ Han 8D^{2) 3)} plug
- ④ Harting adapter
- ⑤ Protective cover over keys
- ⑥ Blanking plug
- ⑦ Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
- ⑧ Sealing screw with valve (option)
- ⑨ Process connection: ¼-18 NPT (IEC 61518)

- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "Explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA" [IS + XP]"
- 4) 92 mm (3.6 inch) for minimum distance to permit rotation with indicator
- 5) 74 mm (2.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
- 6) 91 mm (3.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
- 7) 219 mm (8.62 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
- 8) For Pg 13,5 with adapter approx. 45 mm (1.77 inch)

SITRANS P DS III pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines, optional "H03", dimensional drawing, dimensions in mm (inch)



SITRANS P DS III pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for level

1

Technical specifications

| SITRANS P DS III for level | HART | | PROFIBUS PA or FOUNDATION Fieldbus | |
|--|--|----------------------------|--|----------------------------|
| Input | | | | |
| Measured variable | Level | | | |
| Spans (infinitely adjustable) or nominal measuring range and max. permissible operating pressure | Span (min. ... max.) | Maximum operating pressure | Nominal measuring range | Maximum operating pressure |
| | 25 ... 250 mbar (10 ... 100 inH ₂ O) | See "Mounting flange" | 250 mbar (100 inH ₂ O) | See "Mounting flange" |
| | 25 ... 600 mbar (10 ... 240 inH ₂ O) | See "Mounting flange" | 600 mbar (240 inH ₂ O) | See "Mounting flange" |
| | 53 ... 1600 mbar (21 ... 642 inH ₂ O) | See "Mounting flange" | 1600 mbar (642 inH ₂ O) | See "Mounting flange" |
| | 160 ... 5000 mbar (64 ... 2000 inH ₂ O) | See "Mounting flange" | 5 bar (2000 inH ₂ O) | See "Mounting flange" |
| Lower measuring limit | -100 % of max. span or 500 mbar a (7.25 psia) Also available as vacuum-resistant remote seal: 30 mbar a (0.44 psi a) | | | |
| • Measuring cell with silicone oil filling | | | | |
| Upper measuring limit | 100 % of max. span | | 100 % of the max. nominal measuring range | |
| Output | | | | |
| Output signal | 4 ... 20 mA | | Digital PROFIBUS PA and FOUNDATION Fieldbus signal | |
| • Lower limit (infinitely adjustable) | 3.55 mA, factory preset to 3.84 mA | | - | |
| • Upper limit (infinitely adjustable) | 23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA | | - | |
| Load | | | | |
| • Without HART | $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V | | - | |
| • With HART | $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator) | | - | |
| Physical bus | - | | IEC 61158-2 | |
| Protection against polarity reversal | Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage. | | | |
| Electrical damping (step width 0.1 s) | Set to 2 s (0 ... 100 s) | | | |
| Measuring accuracy | Acc. to IEC 60770-1 | | | |
| Reference conditions (All error data refer always refer to the set span) | Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span / set span) | | | |
| Error in measurement at limit setting incl. hysteresis and reproducibility | | | | |
| • Linear characteristic | | | ≤ 0.15 % | |
| - r ≤ 10 | ≤ 0.15 % | | | |
| - 10 < r ≤ 30 | ≤ 0.3 % | | | |
| - 30 < r ≤ 100 | ≤ (0.0075 · r + 0.075) % | | | |
| Long-term stability (temperature change ± 30 °C (± 54 °F)) | ≤ (0.25 · r) % every 5 years static pressure max. 70 bar (1015 psi) | | ≤ 0.25 % every 5 years static pressure max. 70 bar (1015 psi) | |
| Influence of ambient temperature | | | | |
| • at -10 ... +60 °C (14 ... 140 °F) | | | | |
| - 250 mbar- (100 inH ₂ O)-measuring cell | ≤ (0.5 · r + 0.2) % ^{1) 4)} | | ≤ 0.7 % | |
| - 600 mbar- (240 inH ₂ O)-measuring cell | ≤ (0.3 · r + 0.2) % ^{2) 4)} | | ≤ 0.5 % | |
| - 1600 and 5000 mbar- (642 and 2000 inH ₂ O)-measuring cell | ≤ (0.25 · r + 0.2) % ^{3) 4)} | | ≤ 0.45 % | |
| • at -40 ... -10 °C and 60 ... 85 °C (-40 ... +14 °F and 140 ... 185 °F) | | | | |
| - 250 mbar- (100 inH ₂ O)-measuring cell | ≤ (0.25 · r + 0.15) %/10 K doubled values at 10 < r ≤ 30 | | ≤ 0.4 %/10 K | |
| - 600 mbar- (240 inH ₂ O)-measuring cell | ≤ (0.15 · r + 0.15) %/10 K doubled values at 10 < r ≤ 30 | | ≤ 0.3 %/10 K | |
| - 1600 and 5000 mbar- (642 and 2000 inH ₂ O)-measuring cell | ≤ (0.12 · r + 0.15) %/10 K double values at 10 < r ≤ 30 | | ≤ 0.27 %/10 K | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
 for level

1

| SITRANS P DS III for level | HART | PROFIBUS PA or FOUNDATION Fieldbus |
|---|---|---|
| Influence of static pressure | | |
| <ul style="list-style-type: none"> on the zero point <ul style="list-style-type: none"> - 250 mbar- (100 inH₂O)-measuring cell - 600 mbar- (240 inH₂O)-measuring cell - 1600 and 5000 mbar- (642 and 2000 inH₂O)-measuring cell on the span | $\leq (0.3 \cdot r) \% \text{ per nominal pressure}$ $\leq (0.15 \cdot r) \% \text{ per nominal pressure}$ $\leq (0.1 \cdot r) \% \text{ per nominal pressure}$ $\leq (0.1 \cdot r) \% \text{ per nominal pressure}$ | $\leq 0.3 \% \text{ per nominal pressure}$ $\leq 0.15 \% \text{ per nominal pressure}$ $\leq 0.1 \% \text{ per nominal pressure}$ $\leq 0.1 \% \text{ per nominal pressure}$ |
| Measured Value Resolution | - | $3 \cdot 10^{-5}$ of nominal measuring range |
| Rated conditions | | |
| Degree of protection to IEC 60529 | IP65 (optional IP65/IP68) | |
| Temperature of medium | Note: Always take into account assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection! $-40 \dots +100^{(5)} \text{ } ^\circ\text{C} (-40 \dots +212^{(5)} \text{ } ^\circ\text{F})$ $p_{\text{abs}} \geq 1 \text{ bar: } -40 \dots +175 \text{ } ^\circ\text{C} (-40 \dots +347 \text{ } ^\circ\text{F})$ $p_{\text{abs}} < 1 \text{ bar: } -40 \dots +80 \text{ } ^\circ\text{C} (-40 \dots +176 \text{ } ^\circ\text{F})$ $-40 \dots +100 \text{ } ^\circ\text{C} (-40 \dots +212 \text{ } ^\circ\text{F})$ $-20 \dots +60 \text{ } ^\circ\text{C} (-4 \dots +140 \text{ } ^\circ\text{F})$ in conjunction with dust explosion protection | |
| <ul style="list-style-type: none"> Measuring cell with silicone oil filling <ul style="list-style-type: none"> - High-pressure side - Low-pressure side | | |
| Ambient conditions | | |
| <ul style="list-style-type: none"> Ambient temperature <ul style="list-style-type: none"> - Transmitter (with 4-wire connection, observe temperature values of supplementary 4-wire electronics) - Display readable Storage temperature Climatic class <ul style="list-style-type: none"> - Condensation Electromagnetic Compatibility <ul style="list-style-type: none"> - Emitted interference and interference immunity | $-40 \dots +85 \text{ } ^\circ\text{C} (-40 \dots +185 \text{ } ^\circ\text{F})$ $-30 \dots +85 \text{ } ^\circ\text{C} (-22 \dots +185 \text{ } ^\circ\text{F})$ $-50 \dots +85 \text{ } ^\circ\text{C} (-58 \dots +185 \text{ } ^\circ\text{F})$ Relative humidity 0 ... 100 %, condensation permissible, suitable for use in the tropics Acc. to IEC 61326 and NAMUR NE 21 | |
| Design | | |
| Weight (without options) | | |
| <ul style="list-style-type: none"> To EN (pressure transmitter with mounting flange, without tube) To ASME (pressure transmitter with mounting flange, without tube) | $\approx 11 \dots 13 \text{ kg} (\approx 24.2 \dots 28.7 \text{ lb})$ $\approx 11 \dots 18 \text{ kg} (\approx 24.2 \dots 39.7 \text{ lb})$ | |
| Enclosure material | Low-copper die-cast aluminum, GD-AISI12 or stainless steel precision casting, mat. no. 1.4408 | |
| Wetted parts materials | | |
| High-pressure side | | |
| <ul style="list-style-type: none"> Seal diaphragm of mounting flange | Stainless steel, mat. no. 1.4404/316L, Monel, mat. no. 2.4360, Hastelloy B2, mat. no. 2.4617, Hastelloy C276, mat. no. 2.4819, Hastelloy C4, mat. no. 2.4610, tantalum, PTFE, ETCFE, stainless steel Duplex, mat. no. 1.4462 | |
| Measuring cell filling | Silicone oil | |
| Process connection | Flange to EN and ASME | |
| <ul style="list-style-type: none"> High-pressure side Low-pressure side | Female thread 1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to EN 61518 | |
| Power supply U_H | | |
| Terminal voltage on transmitter | 10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode | Supplied through bus - |
| Separate 24 V power supply necessary | - | No |
| Bus voltage | | |
| <ul style="list-style-type: none"> Not Ex With intrinsically-safe operation | - | 9 ... 32 V 9 ... 24 V |
| Current consumption | | |
| <ul style="list-style-type: none"> Basic current (max.) Start-up current \leq basic current Max. current in event of fault | - | 12.5 mA Yes 15.5 mA |
| Fault disconnection electronics (FDE) available | - | Yes |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for level

1

| SITRANS P DS III for level | HART | PROFIBUS PA or FOUNDATION Fieldbus |
|---|---|--|
| Certificates and approvals | | |
| Classification according to PED 97/23/EC | For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 3, paragraph 3 (sound engineering practice) | |
| Explosion protection | | |
| • Intrinsic safety "i" | PTB 13 ATEX 2007 X | |
| - Marking | Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6 | |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$ | FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Explosion-proof "d" | PTB 99 ATEX 1160 | |
| - Marking | Ex II 1/2 G Ex d IIC T4/T6 Gb | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6 | |
| - Connection | To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ | To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$ |
| • Dust explosion protection for zone 20 | PTB 01 ATEX 2055 | |
| - Marking | Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C | |
| - Permissible ambient temperature | -40 ... +85 °C (-40 ... +185 °F) | |
| - Max. surface temperature | 120 °C (248 °F) | |
| - Connection | To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$ | FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Dust explosion protection for zone 21/22 | PTB 01 ATEX 2055 | |
| - Marking | Ex II 2 D IP65 T 120 °C | |
| - Connection | To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\text{max}} = 1.2 \text{ W}$ | To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\text{max}} = 1 \text{ W}$ |
| • Type of protection "n" (zone 2) | PTB 13 ATEX 2007 X | |
| - Marking | Ex II 2/3 G Ex nA II T4/T5/T6 Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gc | |
| - Connection (Ex nA) | $U_m = 45 \text{ V}$ | $U_m = 32 \text{ V}$ |
| - Connection (Ex ic) | To circuits with values: $U_i = 45 \text{ V}$ | FISCO supply unit ic: $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$ |
| - Effective internal inductance/capacitance | $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ | $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ |
| • Explosion protection acc. to FM | Certificate of Compliance 3008490 | |
| - Identification (XP/DIP) or (IS); (NI) | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III | |
| • Explosion protection to CSA | Certificate of Compliance 1153651 | |
| - Identification (XP/DIP) or (IS) | CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III | |

1) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < $(0.4 \cdot r + 0.16) \% / 28 \text{ °C}$ (50 °F).

2) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < $(0.24 \cdot r + 0.16) \% / 28 \text{ °C}$ (50 °F).

3) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < $(0.2 \cdot r + 0.16) \% / 28 \text{ °C}$ (50 °F).

4) 0.32 instead of 0.16 at $10 < r < 30$

5) This value may be increased if the process connection is sufficiently insulated.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
 for level

1

| HART communication | |
|---|--|
| HART | 230 ... 1100 Ω |
| Protocol | HART Version 5.x |
| Software for computer | SIMATIC PDM |
| PROFIBUS PA communication | |
| Simultaneous communication with master class 2 (max.) | 4 |
| The address can be set using | Configuration tool or local operation (standard setting address 126) |
| Cyclic data usage | |
| • Output byte | 5 (one measured value) or 10 (two measured values) |
| • Input byte | 0, 1, or 2 (register operating mode and reset function for metering) |
| Internal preprocessing | |
| Device profile | PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B |
| Function blocks | 2 |
| • Analog input | |
| - Adaptation to customer-specific process variables | Yes, linearly rising or falling characteristic |
| - Electrical damping, adjustable | 0 ... 100 s |
| - Simulation function | Input/Output |
| - Failure mode | parameterizable (last good value, substitute value, incorrect value) |
| - Limit monitoring | Yes, one upper and lower warning limit and one alarm limit respectively |
| • Register (totalizer) | Can be reset, preset, optional direction of counting, simulation function of register output |
| - Failure mode | parameterizable (summation with last good value, continuous summation, summation with incorrect value) |
| - Limit monitoring | One upper and lower warning limit and one alarm limit respectively |
| • Physical block | 1 |
| Transducer blocks | 2 |
| • Pressure transducer block | |
| - Can be calibrated by applying two pressures | Yes |
| - Monitoring of sensor limits | Yes |
| - Specification of a container characteristic with | Max. 30 nodes |
| - Square-rooted characteristic for flow measurement | Yes |
| - Gradual volume suppression and implementation point of square-root extraction | Parameterizable |
| - Simulation function for measured pressure value and sensor temperature | Constant value or over parameterizable ramp function |

FOUNDATION Fieldbus communication

Function blocks

3 function blocks analog input, 1 function block PID

- Analog input
 - Adaptation to customer-specific process variables
 - Electrical damping, adjustable
 - Simulation function
 - Failure mode
 - Limit monitoring
 - Square-rooted characteristic for flow measurement
- PID
- Physical block

Yes, linearly rising or falling characteristic

0 ... 100 s

Output/input (can be locked within the device with a bridge)

parameterizable (last good value, substitute value, incorrect value)

Yes, one upper and lower warning limit and one alarm limit respectively

Yes

Standard FOUNDATION Fieldbus function block

1 resource block

Transducer blocks

1 transducer block Pressure with calibration, 1 transducer block LCD

- Pressure transducer block
 - Can be calibrated by applying two pressures
 - Monitoring of sensor limits
 - Simulation function: Measured pressure value, sensor temperature and electronics temperature

Yes

Yes

Constant value or over parameterizable ramp function

Mounting flange

Nominal diameter

Nominal pressure

- Acc. to EN 1092-1
 - DN 80
 - DN100
- To ASME B16.5
 - 3 inch
 - 4 inch

PN 40

PN16, PN40

Class 150, class 300

Class 150, class 300

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for level

1

| Selection and Ordering data | | Article No. |
|--|---|--------------------|
| Pressure transmitter for level, SITRANS P DS III with HART | | 7MF4633- |
| Measuring cell filling | Measuring cell cleaning | Y - - - - - |
| Silicone oil | normal | 1 |
| Measuring span (min. ... max.) | | D |
| 25 ... 250 mbar | (10 ... 100 inH ₂ O) | E |
| 25 ... 600 mbar | (10 ... 240 inH ₂ O) | F |
| 53 ... 1600 mbar | (21 ... 642 inH ₂ O) | G |
| 0.16 ... 5 bar | (64.3 ... 2000 inH ₂ O) | |
| Process connection of low-pressure side | | |
| Female thread 1/4-18 NPT with flange connection | | |
| • Mounting thread 7/16-20 UNF to IEC 61518 | | 2 |
| • Mounting thread M10 to DIN 19213 (only for replacement requirement) | | 0 |
| Non-wetted parts materials | | |
| process flange screws | Electronics housing | |
| Stainless steel | Die-cast aluminum | 2 |
| Stainless steel | Stainless steel precision casting ¹⁾ | 3 |
| Version | | |
| • Standard versions | | 1 |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | | 2 |
| Explosion protection | | |
| • None | | A |
| • With ATEX, Type of protection: | | B |
| - "Intrinsic safety (Ex ia)" | | D |
| - "Explosion-proof (Ex d)" ²⁾ | | P |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) ³⁾ | | E |
| - "Ex nA/ic (Zone 2)" ⁴⁾ | | R |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)" ³⁾ | | F |
| • FM + CSA intrinsic safe (is) | | S |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | | |
| • With FM + CSA, Type of protection: | | NC |
| - "Intrinsic Safe und Explosion Proof (is + xp)" ¹⁾ | | |
| Electrical connection/cable entry | | |
| • Screwed gland Pg 13.5 ⁵⁾ | | A |
| • Screwed gland M20x1.5 | | B |
| • Screwed gland 1/2-14 NPT | | C |
| • Han 7D plug (plastic housing) incl. mating connector ⁵⁾ | | D |
| • M12 connectors (stainless steel) ^{5) 6) 7)} | | F |
| Display | | |
| • Without display | | 0 |
| • Without visible display (display concealed, setting: mA) | | 1 |
| • With visible display | | 6 |
| • With customer-specific display (setting as specified, Order code "Y21" or "Y22" required) | | 7 |

Ordering information

1st order item: Pressure transmitter 7MF4633-...

2nd order item: Mounting flange 7MF4912-3...

Ordering example

Item line 1: 7MF4633-1EY20-1AA1-Z

B line: Y01

C line: Y01: 80 to 143 mbar (1.16 to 2.1 psi)

Item line 2: 7MF4912-3GE01

Power supply units see Chap. 7 "Supplementary Components".

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

1) Not in conjunction with electrical connection "Screwed gland Pg 13.5" and "Han7D plug".

2) Without cable gland, with blanking plug.

3) With enclosed cable gland Ex ia and blanking plug.

4) Configurations with HAN and M12 connectors are only available in Ex nL.

5) Not in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof".

6) M12 delivered without cable socket

7) Not available with protection type „Ex d“ (optiones D, P, N and R)

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
for level

1

| Selection and Ordering data | Article No. |
|--|--------------------|
| Pressure transmitters for level | |
| SITRANS P DS III with PROFIBUS PA (PA) | 7MF4634 - |
| SITRANS P DS III with FOUNDATION Fieldbus (FF) | 7MF4635 - |
| | 1 Y - - - - |
| Nominal measuring range | |
| 250 mbar (100 inH ₂ O) | D |
| 600 mbar (240 inH ₂ O) | E |
| 1600 mbar (642 inH ₂ O) | F |
| 5 bar (2000 inH ₂ O) | G |
| Process connection of low-pressure side | |
| Female thread 1/4-18 NPT with flange connection | |
| • Mounting thread 7/16-20 UNF to IEC 61518 | 2 |
| • Mounting thread M10 to DIN 19213 (only for replacement requirement) | 0 |
| Non-wetted parts materials | |
| process flange screws Electronics housing | |
| Stainless steel Die-cast aluminum | 2 |
| Stainless steel Stainless steel precision casting | 3 |
| Version | |
| • Standard versions | 1 |
| • International version, English label inscriptions, documentation in 5 languages on CD (no Order code selectable) | 2 |
| Explosion protection | |
| • None | A |
| • With ATEX, Type of protection: | |
| - "Intrinsic safety (Ex ia)" | B |
| - "Explosion-proof (Ex d)" ¹⁾ | D |
| - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) ²⁾ | P |
| - "Ex nA/ic (Zone 2)" ³⁾ | E |
| - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D) ²⁾ (not for DS III FF) | R |
| • FM + CSA intrinsic safe (is) | F |
| • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) | S |
| • With FM + CSA, Type of protection: | |
| - "Intrinsic Safe und Explosion Proof (is + xp)" ¹⁾ | NC |
| Electrical connection/cable entry | |
| • Screwed gland M20 x 1.5 | B |
| • Screwed gland 1/2-14 NPT | C |
| • M12 connectors (stainless steel) ^{4) 5)} | F |
| Display | |
| • Without display | 0 |
| • Without visible display (display concealed, setting: bar) | 1 |
| • With visible display | 6 |
| • With customer-specific display (setting as specified, Order code "Y21" required) | 7 |

Ordering information

1st order item: Pressure transmitter 7MF4634-...

2nd order item: Mounting flange 7MF4912-...

ordering example

Item line 1: 7MF4634-1EY20-1AA1

Item line 2: 7MF4912-3GE01

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- 1) Without cable gland, with blanking plug.
- 2) With enclosed cable gland Ex ia and blanking plug.
- 3) Configurations with HAN and M12 connectors are only available in Ex nL.
- 4) M12 delivered without cable socket
- 5) Not in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof".

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for level

1

| Selection and Ordering data | Order code | | |
|--|-------------------|----|----|
| <i>Further designs</i> | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code. | | | |
| O-rings for process flanges on low-pressure side (instead of FPM (Viton)) | | | |
| • PTFE (Teflon) | A20 | ✓ | ✓ |
| • FEP (with silicone core, approved for food) | A21 | ✓ | ✓ |
| • FFPM (Kalrez, compound 4079) | A22 | ✓ | ✓ |
| • NBR (Buna N) | A23 | ✓ | ✓ |
| Plug | | | |
| • Han 7D (metal, gray) | A30 | ✓ | |
| • Han 8U (instead of Han 7D) | A31 | ✓ | |
| • Angled | A32 | ✓ | |
| • Han 8D (metal, gray) | A33 | ✓ | |
| Sealing screw ¼-18 NPT, with valve in mat. of process flanges | A40 | ✓ | ✓ |
| Cable sockets for M12 connectors (stainless steel) | A50 | ✓ | ✓ |
| Rating plate inscription (instead of German) | | | |
| • English | B11 | ✓ | ✓ |
| • French | B12 | ✓ | ✓ |
| • Spanish | B13 | ✓ | ✓ |
| • Italian | B14 | ✓ | ✓ |
| English rating plate Pressure units in inH ₂ O and/or psi | B21 | ✓ | ✓ |
| Quality inspection certificate (Five-step factory calibration) to IEC 60770-2 | C11 | ✓ | ✓ |
| Inspection certificate Acc. to EN 10204-3.1 | C12 | ✓ | ✓ |
| Factory certificate Acc. to EN 10204-2.2 | C14 | ✓ | ✓ |
| Functional safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | C20 | ✓ | |
| Functional safety (PROFIsafe) Certificate and PROFIsafe protocol | C21 ¹⁾ | | ✓ |
| Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration | C23 | ✓ | |
| Device passport Russia (For price request please contact the technical support www.siemens.com/automation/support-request) | C99 | ✓ | ✓ |
| Setting of upper limit of output signal to 22.0 mA | D05 | ✓ | |
| Degree of protection IP65/IP68 (only for M20x1.5 and ½-14 NPT) | D12 | ✓ | ✓ |
| Supplied with oval flange (1 item), PTFE packing and screws in thread of process flange | D37 | ✓ | ✓ |

| Selection and Ordering data | Order code | | |
|---|-------------------|----|----|
| <i>Further designs</i> | HART | PA | FF |
| Add "-Z" to Article No. and specify Order code. | | | |
| Use on zone 1D / 2D (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia)") | E01 | ✓ | ✓ |
| Overfilling safety device for flammable and non-flammable liquids (max. PN 32 (MAWP 464 psi), basic device with type of protection "Intrinsic safety (Ex ia)", to WHG and VbF, not together with measuring cell filling "inert liquid") | E08 | ✓ | |
| Export approval Korea | E11 | ✓ | ✓ |
| CRN approval Canada (Canadian Registration Number) | E22 | ✓ | ✓ |
| Dual seal | E24 | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..) | E25 ²⁾ | ✓ | ✓ |
| "Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..) | E26 ²⁾ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..) | E28 ²⁾ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..) | E45 ²⁾ | ✓ | ✓ |
| Ex Approval IEC Ex (Ex id) (only for transmitter 7MF4...-.....-D..) | E46 ²⁾ | ✓ | ✓ |
| Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..) | E55 ²⁾ | ✓ | ✓ |
| Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..) | E56 ²⁾ | ✓ | ✓ |
| Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..) | E57 ²⁾ | ✓ | ✓ |
| "Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11) | E70 ²⁾ | ✓ | ✓ |
| Two coats of lacquer on casing and cover (PU on epoxy) | G10 | ✓ | ✓ |
| Replacement of process connection side | H01 | ✓ | ✓ |
| Transient protector 6 kV (lightning protection) | J01 | ✓ | ✓ |

¹⁾ Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

²⁾ Option beinhaltet keine ATEX-Zulassung, sondern nur die landesspezifische Zulassung.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
for level

1

| Selection and Ordering data | Order code | | | |
|---|----------------------------|------|-----------------|----|
| Additional data | | HART | PA | FF |
| Please add "-Z" to Article No. and specify Order code(s) and plain text. | | | | |
| Measuring range to be set Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi | Y01 | ✓ | ✓ ¹⁾ | |
| Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15: | Y15 | ✓ | ✓ | ✓ |
| Measuring point text (entry in device variable) Max. 27 characters, specify in plain text: Y16: | Y16 | ✓ | ✓ | ✓ |
| Entry of HART address (TAG) Max. 8 characters, specify in plain text: Y17: | Y17 | ✓ | | |
| Setting of pressure indicator in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ¹⁾ , inH ₂ O ¹⁾ , ftH ₂ O ¹⁾ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or % ¹⁾ ref. temperature 20 °C | Y21 | ✓ | ✓ | ✓ |
| Setting of pressure indicator in non-pressure units²⁾ Specify in plain text: Y22: up to l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters) | Y22 ³⁾ + Y01 | ✓ | | |
| Preset bus address possible between 1 and 126 Specify in plain text: Y25: | Y25 | | ✓ | ✓ |
| Damping adjustment in seconds (0 ... 100 s) | Y30 | ✓ | ✓ | ✓ |

Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

¹⁾ Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

²⁾ Preset values can only be changed over SIMATIC PDM.

³⁾ Not in conjunction with over-filling safety device for flammable and non-flammable liquids (Order code "E08")

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for level

1

| Selection and Ordering data | | Article No. | Ord. code | Selection and Ordering data | | | Order code | | |
|--|-------------------------|----------------|-----------|---|--|--|-------------------|--|--|
| Mounting flange | | 7 MF 4 9 1 2 - | | Further designs | | | HART PA FF | | |
| Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series | | 3 | | Add "-Z" to Article No. and specify Order code. | | | | | |
| Connection to EN 1092-1 | | | | Spark arrester | | | A01 | | |
| Nominal diameter | Nominal pressure | | | For mounting on zone 0 (incl. documentation) | | | ✓ ✓ ✓ | | |
| DN 50 | PN 40 | A | | Remote seal nameplate | | | B20 | | |
| | PN 100 | B | | attached out of stainless steel, contains Article No. and order number of the remote seal supplier | | | ✓ ✓ ✓ | | |
| DN 80 | PN 40 | D | | 2.2 Certificate for oil-free and grease-free cleaning | | | C10 | | |
| DN 100 | PN 16 | G | | For inert filling liquid, <u>not for operation with oxygen</u> , Option E10 cannot be selected. | | | ✓ ✓ ✓ | | |
| | PN 40 | H | | Quality inspection certificate (Five-step factory calibration) to IEC 60770-2 | | | C11 | | |
| Connection to ASME B16.5 | | | | Inspection certificate | | | C12 | | |
| Nominal diameter | Nominal pressure | | | Acc. to EN 10204-3.1 | | | ✓ ✓ ✓ | | |
| 2 inch | class 150 | L | | 2.2 Certificate of FDA approval of fill oil | | | C17 | | |
| | class 300 | M | | Only in conjunction with filling liquid "Food oil" (FDA listed)" | | | ✓ ✓ ✓ | | |
| | class 400/600 | N | | "Functional safety (SIL2)" certificate to IEC 61508 | | | C20 | | |
| | class 900/1500 | P | | (only for conjunction with the Order code "C20" in the case of SITRANS P DS III transmitter) | | | ✓ ✓ ✓ | | |
| 3 inch | Class 150 | Q | | "Functional safety (SIL2/3)" certificate to IEC 61508 | | | C23 | | |
| | Class 300 | R | | (only for conjunction with the Order code "C23" in the case of SITRANS P DS III transmitter) | | | ✓ ✓ ✓ | | |
| 4 inch | Class 150 | T | | Certification acc. to NACE MR-0175 | | | D07 | | |
| | Class 300 | U | | Includes acceptance test certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | | | ✓ ✓ ✓ | | |
| Other version, add Order code and plain text: Nominal diameter: ...; Nominal press.: ... | | Z | | Certification acc. to NACE MR-0103 | | | D08 | | |
| | | J 1 Y | | Includes acceptance test certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276) | | | ✓ ✓ ✓ | | |
| Wetted parts materials | | | | Epoxy painting | | | E15 | | |
| • Stainless steel 316L | | A | | Not possible with vacuum-proof design | | | ✓ ✓ ✓ | | |
| - Coated with PFA | | D | | Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42... only possible with process connection G½B according to EN837-1. | | | | | |
| - Coated with PTFE | | E 0 | | Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA | | | J12 | | |
| • Coated with ECTFE ¹⁾ | | F | | instead of sealing surface B2 or RF SF (only for wetted parts made of Hastelloy C276 (2.4819), tantalum and Duplex 2205 (1.4462) and for nominal sizes 2", 3", DN 50 and DN 80) | | | ✓ ✓ ✓ | | |
| • Monel 400, mat. no. 2.4360 | | G | | Sealing surface groove, EN 1092-1, form D | | | J14 | | |
| • Hastelloy C276, mat. no. 2.4819 | | J | | instead of sealing surface B1 (only for wetted parts made of stainless steel 316L) | | | ✓ ✓ ✓ | | |
| • Hastelloy C4, mat. no. 2.4610 | | U | | Sealing surface R JF (groove) ASME B16.5 | | | J24 | | |
| • Tantalum | | K | | instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L) | | | ✓ ✓ ✓ | | |
| • Duplex 2205, mat. no. 1.4462 | | Q | | Elongated pipe, 150 mm instead of 100 mm, | | | R15 | | |
| • Duplex 2205, mat. no. 1.4462, incl. main body | | R | | max. medium temperature 250 °C, observe the maximum permissible media temperature of the filling liquid. | | | ✓ ✓ ✓ | | |
| • Stainless steel 316L, gold plated, thickness approx. 25 µm | | S 0 | | Elongated pipe, 200 mm instead of 100 mm, | | | R20 | | |
| | | K 1 Y | | max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid. | | | ✓ ✓ ✓ | | |
| Tube length | | | | Vacuum-proof design | | | V04 | | |
| • None | | 0 | | (for use in low-pressure range) | | | ✓ ✓ ✓ | | |
| • 50 mm (1.97 inch) | | 1 | | Note: suffix "Y01" required with press. transm. | | | | | |
| • 100 mm (3.94 inch) | | 2 | | ✓ = available | | | | | |
| • 150 mm (5.90 inch) | | 3 | | | | | | | |
| • 200 mm (7.87 inch) | | 4 | | | | | | | |
| Other version: add Order code and plain text: material of parts in contact with medium:, tubus length: | | Z 8 | | | | | | | |
| | | M 1 Y | | | | | | | |
| Filling liquid | | | | | | | | | |
| • Silicone oil M5 | | 1 | | | | | | | |
| • Silicone oil M50 | | 2 | | | | | | | |
| • High-temperature oil | | 3 | | | | | | | |
| • Halocarbon oil (for O ₂ -measurement) | | 4 | | | | | | | |
| • Glycerin/water ²⁾ | | 6 | | | | | | | |
| • Food oil (FDA-listed) | | 7 | | | | | | | |
| Other version, add Order code and plain text: filling liquid: ... | | 9 | | | | | | | |
| | | | | | | | | | |

1) For vacuum on request

2) Not suitable for use in low-pressure range

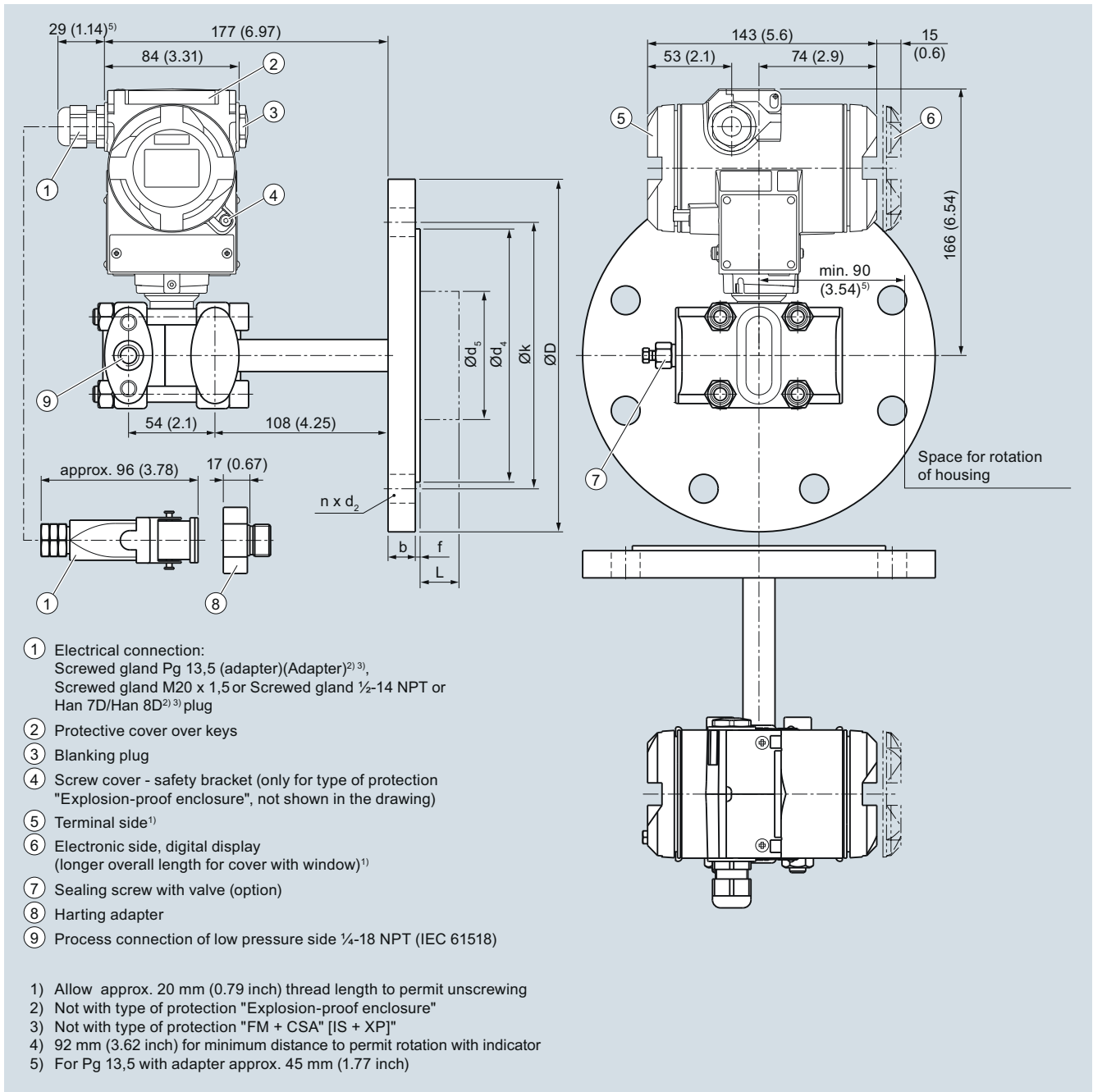
Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
for level

1

Dimensional drawings



SITRANS P DS III with HART pressure transmitters for level, including mounting flange, dimensions in mm (inch)

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III for level

1

Connection to EN 1092-1

| Nominal diameter | Nominal pressure | b | D | d | d ₂ | d ₄ | d ₅ | d _M | f | k | n | L |
|------------------|------------------|----|-----|-----|----------------|----------------|----------------|------------------|----|-----|----|------------------------|
| | | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm | mm |
| DN 50 | PN 10/16/25/40 | 20 | 165 | 90 | 18 | 102 | 48.3 | 45 ¹⁾ | 2 | 125 | 8 | 0, 50, 100, 150 or 200 |
| | PN 100 | 28 | 195 | 90 | 26 | 102 | 48.3 | 45 ¹⁾ | 2 | 145 | 8 | |
| DN 80 | PN 10/16/25/40 | 24 | 200 | 90 | 18 | 138 | 76 | 72 ²⁾ | 2 | 160 | 8 | |
| | PN 100 | 32 | 230 | 90 | 26 | 138 | 76 | 72 ²⁾ | 2 | 180 | 8 | |
| DN 100 | PN 10/16 | 20 | 220 | 115 | 18 | 158 | 94 | 89 | 2 | 180 | 8 | |
| | PN 25/40 | 24 | 235 | 115 | 22 | 162 | 94 | 89 | 2 | 190 | 8 | |

Connection to ASME B16.5

| Nominal diameter | Nominal pressure | b | D | d ₂ | d ₄ | d ₅ | d _M | f | k | n | L |
|------------------|------------------|------------------------|-------------|----------------|----------------|----------------|-------------------------|-----------|--------------|-----------|---|
| | | lb./sq.in inch (mm) | inch (mm) | inch (mm) | inch (mm) | inch (mm) | inch (mm) | inch (mm) | inch (mm) | inch (mm) | inch (mm) |
| 2 inch | 150 | 0.77 (19.5) | 5.91 (150) | 0.79 (20) | 3.62 (92) | 1.9 (48.3) | 1.77 ¹⁾ (45) | 0.08 (2) | 4.74 (120.5) | 4 | 0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200) |
| | 300 | 0.89 (22.7) | 6.5 (165) | 0.79 (20) | 3.62 (92) | 1.9 (48.3) | 1.77 ¹⁾ (45) | 0.08 (2) | 5 (127) | 8 | |
| | 400/600 | 1.28 (32.4) | 6.5 (165) | 0.79 (20) | 3.62 (92) | 1.9 (48.3) | 1.77 ¹⁾ (45) | 0.28 (7) | 5 (127) | 8 | |
| | 900/1500 | 1.78 (45.1) | 8.46 (215) | 1.02 (26) | 5 (127) | 1.9 (48.3) | 1.77 ¹⁾ (45) | 0.28 (7) | 6.5 (165) | 8 | |
| 3 inch | 150 | 0.96 (24.3) | 7.48 (190) | 0.79 (20) | 5 (127) | 3 (76) | 2.83 ²⁾ (72) | 0.08 (2) | 6 (152.5) | 4 | |
| | 300 | 1.14 (29) | 8.27 (210) | 0.87 (22) | 5 (127) | 3 (76) | 2.83 ²⁾ (72) | 0.08 (2) | 6.63 (168.5) | 8 | |
| | 600 | 1.53 (38.8) | 8.27 (210) | 0.87 (22) | 5 (127) | 3 (76) | 2.83 ²⁾ (72) | 0.28 (7) | 6.63 (168.5) | 8 | |
| 4 inch | 150 | 0.96 (24.3) | 9.06 (230) | 0.79 (20) | 6.22 (158) | 3.69 (94) | 3.5 (89) | 0.08 (2) | 7.5 (190.5) | 8 | |
| | 300 | 1.27 (32.2) | 10.04 (255) | 0.87 (22) | 6.22 (158) | 3.69 (94) | 3.5 (89) | 0.08 (2) | 7.87 (200) | 8 | |
| | 400 | 1.65 (42) | 10.04 (255) | 1.02 (26) | 6.22 (158) | 3.69 (94) | 3.5 (89) | 0.28 (7) | 7.87 (200) | 8 | |

d: Internal diameter of gasket to DIN 2690

d_M: Effective diaphragm diameter

¹⁾ 59 mm = 2.32 inch with tube length L=0.

²⁾ 89 mm = 3½ inch with tube length L=0.

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III Supplementary electronics for 4-wire connection

1

Overview



Direct connection of the supplementary electronics to a SITRANS P DS III pressure transmitter with HART produces a transmitter for 4-wire connection.

The supplementary electronics cannot be attached to explosion-protected pressure transmitters. The supplementary electronics is fitted in a light metal housing which is mounted on the left side of the pressure transmitter.

Note on ordering:

The supplementary electronics can only be ordered as an **optional accessory** for the corresponding pressure transmitter.

Technical specifications

SITRANS P, supplementary electronics for 4-wire connection

Output

| | |
|----------------------|---|
| Output signal | 0 ... 20 mA or 4 ... 20 mA |
| Load | Max. 750 Ω |
| Voltage measurement | Linear (square-rooting in transmitter if necessary) |
| Electrical isolation | Between power supply and input/ output |

Measuring accuracy

| | |
|--|---|
| Measurement deviation (in addition to transmitter) | acc. to IEC 60770-1 ≤ 0.15 % of set span |
| Influence of ambient temperature | ≤ 0.1 % per 10 K |
| Power supply effect | ≤ 0.1 % per 10 % change in voltage or frequency |
| Load effect | ≤ 0.1 % per 100 % change |

Rated conditions

| | |
|-------------------------------------|--|
| Ambient temperature | |
| • 24 V version | -20 ... +80 °C (-4 ... +176 °F) |
| • 230 V version | -20 ... +60 °C (-4 ... +140 °F) |
| Storage temperature | -50 ... +85 °C (-58 ... +185 °F) |
| Degree of protection | IP54 to IEC 60529 |
| Electromagnetic compatibility (EMC) | IEC 61236 |
| Condensation | Relative humidity 0 ... 95 % condensation permissible |

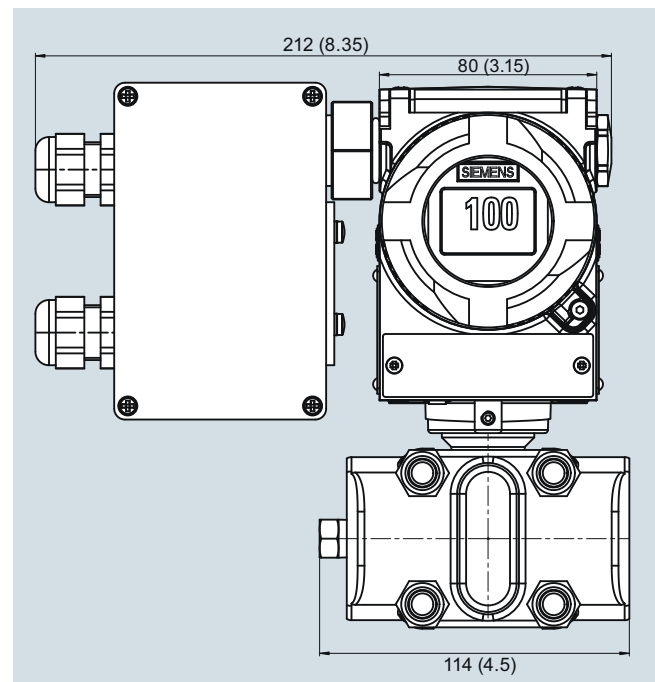
Structural design

| | |
|-------------------------------------|---|
| Dimensions (W x H x D) in mm (inch) | 80 x 120 x 60 (3.15 x 4.72 x 2.36) |
| Electrical connection | Screw terminals (Pg 13.5 cable inlet) or Han 7D / Han 8U plug |

Power supply

| | |
|--|--|
| Supply voltage | 230 V AC (-10 ... +6 %, 47 ... 63 Hz, approx. 6 VA) or 24 V AC/DC (24 V AC ± 10 %, 47 ... 63 Hz, approx. 3 VA) |
| Permissible ripple (within the specified limits) | Approx. 2.5 V _{pp} |

Dimensional drawings



SITRANS P pressure transmitters with supplementary electronics for four-wire connection, dimension drawing, dimensions in mm

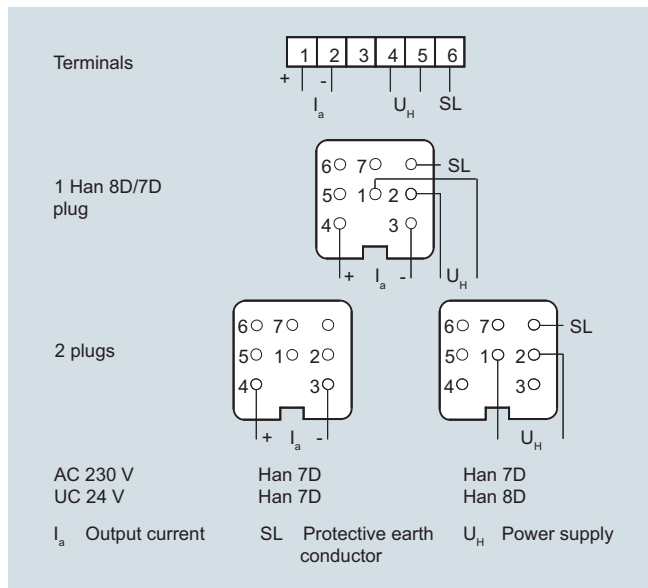
Pressure Measurement

Transmitters for general requirements

SITRANS P DS III Supplementary electronics for 4-wire connection

1

Schematics



Supplementary electronics for 4-wire connection, connection diagram

| Selection and Ordering data | | Order code |
|--|--|--------------------|
| Supplementary electronics for 4-wire connection | | V ■■ |
| Article No. of the transmitter 7MF4.33-.....-AB , add "-Z" and Order code. | | |
| Power supply | Electrical connection | |
| 24 V AC/DC | Terminals; 2 Pg screwed glands, to left | 1 |
| | 2 Han 7D/Han 8U plugs incl. mating connector, to left | 3 |
| | 1 Han 7D plug incl. mating connector, angled | 5 |
| | Terminals; 1 Pg screwed gland, downwards | 6 |
| | 1 Han 8U plug incl. mating connector, downwards (observe arrangement of plug and differential pressure line) | 9 |
| 230 V AC | Terminals; 2 Pg screwed glands, to left | 7 |
| | 2 Han 7D plugs incl. mating connector, to left | 8 |
| Output current | | |
| 0 ... 20 mA | | 0 |
| 4 ... 20 mA | | 1 |
| Accessories | | |
| Instruction Manual German/English | | A5E00322799 |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
Accessories/Spare Parts

1

| Selection and Ordering data | | Article No. |
|--|------------------------------------|-------------------------------------|
| Replacement measuring cell for pressure for SITRANS P DS III | | 7 MF 4 9 9 0 - 0 - 0 DB 0 |
| Measuring cell filling Measuring cell cleaning | | |
| Silicone oil | Normal | 1 |
| Inert liquid | grease-free to cleanliness level 2 | 3 |
| Measured span (min. ... max.) | | |
| 0.01 ... 1 bar | (0.15 ... 14.5 psi) | B |
| 0.04 ... 4 bar | (0.6 ... 58 psi) | C |
| 0.16 ... 16 bar | (2.32 ... 232 psi) | D |
| 0.63 ... 63 bar | (9.14 ... 914 psi) | E |
| 1.6 ... 160 bar | (23.2 ... 2320 psi) | F |
| 4.0 ... 400 bar | (58.0 ... 5802 psi) | G |
| 7.0 ... 700 bar | (102.0 ... 10153 psi) | J |
| Wetted parts materials | | |
| Seal diaphragm | Process connection | |
| Stainless steel | Stainless steel | A |
| Hastelloy | Stainless steel | B |
| Hastelloy | Hastelloy | C |
| Process connection | | |
| <ul style="list-style-type: none"> • Connection shank G$\frac{1}{2}$B to EN 837-1 • Female thread $\frac{1}{2}$-14 NPT • Oval flange made of stainless steel, max. span 160 bar (2320 psi) <ul style="list-style-type: none"> - Mounting thread $\frac{7}{16}$-20 UNF to IEC 61518 - Mounting thread M10 to DIN 19213 | | 0 1 2 3 |
| Further designs | | Order code |
| Please add "-Z" to Article No. and specify Order code. | | |
| Inspection certificate to EN 10204-3.1 | | C12 |

| Selection and Ordering data | | Article No. |
|--|------------------------------------|-------------------------------------|
| Replacement measuring cell for absolute pressure for SITRANS P DS III (from the pressure series) | | 7 MF 4 9 9 2 - 0 - 0 DB 0 |
| Measuring cell filling Measuring cell cleaning | | |
| Silicone oil | Normal | 1 |
| Inert liquid | grease-free to cleanliness level 2 | 3 |
| Measured span (min. ... max.) | | |
| 8.3 ... 250 mbar a | (0.12 ... 3.62 psia) | D |
| 43 ... 1300 mbar a | (0.62 ... 18.85 psia) | F |
| 0.16 ... 5 bar a | (2.32 ... 72.5 psia) | G |
| 1 ... 30 bar a | (14.5 ... 435 psia) | H |
| Wetted parts materials | | |
| Seal diaphragm | Process connection | |
| Stainless steel | Stainless steel | A |
| Hastelloy | Stainless steel | B |
| Hastelloy | Hastelloy | C |
| Process connection | | |
| <ul style="list-style-type: none"> • Connection shank G$\frac{1}{2}$B to EN 837-1 • Female thread $\frac{1}{2}$-14 NPT • Oval flange made of stainless steel, max. span 160 bar (2320 psi) <ul style="list-style-type: none"> - Mounting thread $\frac{7}{16}$-20 UNF to IEC 61518 - Mounting thread M10 to DIN 19213 | | 0 1 2 3 |
| Further designs | | Order code |
| Please add "-Z" to Article No. and specify Order code. | | |
| Inspection certificate to EN 10204-3.1 | | C12 |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III Accessories/Spare Parts

1

| Selection and Ordering data | Article No. |
|--|-----------------------|
| Replacement measuring cell for absolute pressure (from the differential pressure series) for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus series | 7MF4993 - 0DC0 |
| Measuring cell filling Measuring cell cleaning | |
| Silicone oil Normal | 1 |
| Inert liquid grease-free to cleanliness level 2 | 3 |
| Measured span (min. ... max.) | |
| 8.3 ... 250 mbar a (0.12 ... 3.62 psia) | D |
| 43 ... 1300 mbar a (0.62 ... 18.85 psia) | F |
| 0.16 ... 5 bar a (2.32 ... 72.5 psia) | G |
| 1 ... 30 bar a (14.5 ... 435 psia) | H |
| 5.3 ... 100 bar a (76.9 ... 1450 psia) | KE |
| Wetted parts materials | |
| Seal diaphragm Parts of measuring cell | |
| Stainless steel Stainless steel | A |
| Hastelloy Stainless steel | B |
| Hastelloy Hastelloy | C |
| Tantalum Tantalum | E |
| Monel Monel | H |
| Gold Gold | L |
| Process connection | |
| Female thread 1/4-18 NPT with flange connection | |
| • Sealing screw opposite process connection | |
| - Mounting thread M10 to DIN 19213 | 0 |
| - Mounting thread 7/16-20 UNF to IEC 61518 | 2 |
| • Vent on side of process flange ¹⁾ | |
| - Mounting thread M10 to DIN 19213 | 4 |
| - Mounting thread 7/16-20 UNF to IEC 61518 | 6 |
| Non-wetted parts materials | |
| • Stainless steel process flange screws | 2 |
| Further designs | Order code |
| Please add "-Z" to Article No. and specify Order code. | |
| O-rings for process flanges (instead of FPM (Viton)) | |
| • PTFE (Teflon) | A20 |
| • FEP (with silicone core, approved for food) | A21 |
| • FFFM (Kalrez, compound 4079) | A22 |
| • NBR (Buna N) | A23 |
| Inspection certificate to EN 10204-3.1 | C12 |
| Process connection G1/2B | D16 |
| Remote seal flanges (not together with K01, K02 and K04) | D20 |
| Vent on side for gas measurements | H02 |
| Process flanges | |
| • without | K00 |
| • with process flange made of | |
| - Hastelloy | K01 |
| - Monel | K02 |
| - Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi) max. temperature of medium 90 °C (194 °F) For 1/2-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible | K04 |

¹⁾ Not for span "5.3 ... 100 bar (76.9 ... 1450 psi)"

| Selection and Ordering data | Article No. |
|--|-----------------------|
| Replacement measuring cell for differential pressure and PN 32/160 (MAWP 464/2320 psi) for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus series | 7MF4994 - 0DC0 |
| Measuring cell filling Measuring cell cleaning | |
| Silicone oil Normal | 1 |
| Inert liquid grease-free to cleanliness level 2 | 3 |
| Measured span (min. ... max.) | |
| PN 32 (MAWP 464 psi) | |
| 1 ... 20 mbar ¹⁾ (0.4 ... 8 inH ₂ O) | B |
| PN 160 (MAWP 2320 psi) | |
| 1 ... 60 mbar (0.4 ... 24 inH ₂ O) | C |
| 2.5 ... 250 mbar (1 ... 100 inH ₂ O) | D |
| 6 ... 600 mbar (2.4 ... 240 inH ₂ O) | E |
| 16 ... 1600 mbar (6.4 ... 642 inH ₂ O) | F |
| 50 ... 5000 mbar (20 ... 2000 inH ₂ O) | G |
| 0.3 ... 30 bar (4.35 ... 435 psi) | H |
| Wetted parts materials (stainless steel process flanges) | |
| Seal diaphragm Parts of measuring cell | |
| Stainless steel Stainless steel | A |
| Hastelloy Stainless steel | B |
| Hastelloy Hastelloy | C |
| Tantalum ²⁾ Tantalum | E |
| Monel ²⁾ Monel | H |
| Gold ²⁾ Gold | L |
| Process connection | |
| Female thread 1/4-18 NPT with flange connection | |
| • Sealing screw opposite process connection | |
| - Mounting thread M10 to DIN 19213 | 0 |
| - Mounting thread 7/16-20 UNF to IEC 61518 | 2 |
| • Vent on side of process flange | |
| - Mounting thread M10 to DIN 19213 | 4 |
| - Mounting thread 7/16-20 UNF to IEC 61518 | 6 |
| Non-wetted parts materials | |
| Stainless steel process flange screws | 2 |
| Further designs | Order code |
| Please add "-Z" to Article No. and specify Order code. | |
| O-rings for process flanges (instead of FPM (Viton)) | |
| • PTFE (Teflon) | A20 |
| • FEP (with silicone core, approved for food) | A21 |
| • FFFM (Kalrez, compound 4079) | A22 |
| • NBR (Buna N) | A23 |
| Inspection certificate to EN 10204-3.1 | C12 |
| Remote seal flanges (not together with K01, K02 and K04) | D20 |
| Vent on side for gas measurements | H02 |
| Stainless steel process flanges for vertical differential pressure lines (not together with K01, K02 and K04) | H03 |
| Process flanges | |
| • without | K00 |
| • with process flange made of | |
| - Hastelloy | K01 |
| - Monel | K02 |
| - Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi) max. temperature of medium 90 °C (194 °F) For 1/2-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible | K04 |

¹⁾ Not suitable for connection of remote seal

²⁾ Only together with max. spans 250, 1600, 5000 and 30000 mbar (100 inH₂O, 642 inH₂O, 2000 inH₂O und 435 psi).

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
Accessories/Spare Parts

1

| Selection and Ordering data | | Article No. |
|---|----------------------------------|----------------------------|
| Replacement measuring cell for differential pressure and PN 420 (MAWP 6092 psi) for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus series | | 7MF4995 - - 0DC0 |
| Measuring cell filling | Measuring cell cleaning | 1 |
| Silicone oil | Normal | |
| Measured span (min. ... max.) | | D E F G H |
| 2.5 ... 250 mbar | (1 ... 100 inH ₂ O) | |
| 6 ... 600 mbar | (2.4 ... 240 inH ₂ O) | |
| 16 ... 1600 mbar | (6.4 ... 642 inH ₂ O) | |
| 50 ... 5000 mbar | (20 ... 2000 inH ₂ O) | |
| 0.3 ... 30 bar | (4.35 ... 435 psi) | |
| Wetted parts materials (stainless steel process flanges) | | A B L |
| Seal diaphragm | Parts of measuring cell | |
| Stainless steel | Stainless steel | |
| Hastelloy | Stainless steel | |
| Gold ¹⁾ | Gold | |
| Process connection Female thread 1/4-18 NPT with flange connection | | 1 3 5 7 |
| • Sealing screw opposite process connection | | |
| - Mounting thread M12 to DIN 19213 | | |
| - Mounting thread 7/16-20 UNF to IEC 61518 | | |
| • Vent on side of process flange | | |
| - Mounting thread M12 to DIN 19213 | | |
| - Mounting thread 7/16-20 UNF to IEC 61518 | | |
| Non-wetted parts materials | | 2 |
| • Stainless steel process flange screws | | |
| Further designs | | Order code |
| Please add "-Z" to Article No. and specify Order code. | | |
| O-rings for process flanges (instead of FPM (Viton)) | | A20 A21 A22 A23 |
| • PTFE (Teflon) | | |
| • FEP (with silicone core, approved for food) | | |
| • FFPM (Kalrez, compound 4079) | | |
| • NBR (Buna N) | | |
| Inspection certificate to EN 10204-3.1 | | C12 |
| Stainless steel process flanges for vertical differential pressure lines | | H03 |
| without process flanges | | K00 |

¹⁾ Not together with max. span 600 mbar (240.9 inH₂O)

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III Accessories/Spare Parts

1

| Selection and Ordering data | Article No. | Selection and Ordering data | Article No. |
|---|--|--|--|
| Spare parts/Accessories | | Mounting screws | |
| Mounting bracket and fastening parts for pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF403-.....-..C.) For absolute pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF423-.....-..C.) • made of steel • made of stainless steel | 7MF4997-1AB 7MF4997-1AH | For measuring point label, grounding and connection terminals or for display (50 units) | 7MF4997-1CD |
| Mounting bracket and fastening parts for pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF403-.....-..A., ..B., ..D. and ..F.) For absolute pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF423-.....-..A., ..B., ..D. and ..F.) • made of steel • made of stainless steel | 7MF4997-1AC 7MF4997-1AJ | Sealing screws (1 set = 2 units) for process flange • made of stainless steel • made of Hastelloy | 7MF4997-1CG 7MF4997-1CH |
| Mounting and fastening brackets For differential pressure transmitters with flange thread M10 SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF433-.... and 7MF443-....) • made of steel • made of stainless steel | 7MF4997-1AD 7MF4997-1AK | Sealing screws with vent valve Complete (1 set = 2 units) • made of stainless steel • made of Hastelloy | 7MF4997-1CP 7MF4997-1CQ |
| Mounting and fastening brackets For differential pressure transmitters with flange thread M12 SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF453-....) • made of steel • made of stainless steel | 7MF4997-1AE 7MF4997-1AL | Electronics • for SITRANS P DS III with HART • for SITRANS P DS III with PROFIBUS PA • for SITRANS P DS III with FOUNDATION Fieldbus | 7MF4997-1DK 7MF4997-1DL 7MF4997-1DM |
| Mounting and fastening brackets For differential and absolute pressure transmitters with flange thread 7/16 -20 UNF SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF433-...., 7MF443-.... and 7MF453-....) • made of steel • made of stainless steel | 7MF4997-1AF 7MF4997-1AM | Connection board • for SITRANS P DS III • for SITRANS P DS III PROFIBUS PA and FOUNDATION Fieldbus | 7MF4997-1DN 7MF4997-1DP |
| Cover made of die-cast aluminum, including gasket, for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus • without window • with window | 7MF4997-1BB 7MF4997-1BE | O-rings for process flanges made of: • FPM (Viton) • PTFE (Teflon) • FEP (with silicone core, approved for food) • FFPM (Kalrez, compound 4079) • NBR (Buna N) | 7MF4997-2DA 7MF4997-2DB 7MF4997-2DC 7MF4997-2DD 7MF4997-2DE |
| Cover made of stainless steel, including gasket, for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus • without window • with window | 7MF4997-1BC 7MF4997-1BF 7MF4997-1BR | Sealing ring for process connection | see "Fittings" |
| Digital indicator Including mounting material for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus | | Weldable sockets for PMC connection • PMC Style Standard: Thread 1½" • PMC Style Minibolt: front-flush 1" | 7MF4997-2HA 7MF4997-2HB |
| Measuring point label • without inscription (5 units) • Printed (1 unit) Data according to Y01 or Y02, Y15, Y16 and Y99 (see "Pressure transmitters") | 7MF4997-1CA 7MF4997-1CB-Z Y..: | Gaskets for PMC connection (packing unit = 5 units) • PTFE seal for PMC Style Standard: Thread 1½" • Gasket made of Viton for PMC Style Minibolt: front-flush 1" | 7MF4997-2HC 7MF4997-2HD |
| | | Weldable socket for TG52/50 and TG52/150 connection • TG52/50 connection • TG52/150 connection | 7MF4997-2HE 7MF4997-2HF |
| | | Seals for TG 52/50 and TG 52/150 made of silicone (FDA compliant) | 7MF4997-2HG |
| | | Seals for flange connection with front-flush diaphragm Material FPM (Viton), 10 units • DN 25, PN 40 (M11) • DN 25, PN 100 (M21) • 1", class 150 (M40) • 1", class 300 (M45) | 7MF4997-2HH 7MF4997-2HJ 7MF4997-2HK 7MF4997-2HL |
| | | ► Available ex stock | |

Pressure Measurement

Transmitters for general requirements

SITRANS P DS III
Accessories/Spare Parts

1

| Selection and Ordering data | Article No. |
|---|-----------------------|
| Operating Instructions¹⁾ | |
| <ul style="list-style-type: none"> • for SITRANS DS III with HART <ul style="list-style-type: none"> - German A5E00047090 - English A5E00047092 - French A5E00053218 - Spanish A5E00053219 - Italian A5E00053220 • for SITRANS DS III with PROFIBUS PA <ul style="list-style-type: none"> - German A5E00053275 - English A5E00053276 - French A5E00053277 - Spanish A5E00053278 - Italian A5E00053279 • for SITRANS DS III with FOUNDATION Fieldbus <ul style="list-style-type: none"> - German A5E00279629 - English A5E00279627 | |
| Compact operating instructions | |
| The compact operating instructions are available in 21 EU languages on the product CD supplied with each transmitter. They can also be downloaded from the SITRANS P web page. | |
| Brief instruction (Leporello) | |
| German, English | |
| <ul style="list-style-type: none"> • for SITRANS DS III with HART A5E00047093 <ul style="list-style-type: none"> - German, English • for SITRANS DS III with PROFIBUS PA A5E00053274 <ul style="list-style-type: none"> - German, English • for SITRANS DS III with FOUNDATION Fieldbus A5E00282355 <ul style="list-style-type: none"> - German, English | |
| CD with SITRANS P documentation | A5E00090345 |
| German, English, French, Spanish, Italian incl. compact operating instructions in 21 EU languages | |
| Certificates (order only via SAP) | |
| instead of Internet download | |
| <ul style="list-style-type: none"> • hard copy (to order) A5E03252406 • on CD (to order) A5E03252407 | |
| Operating Instructions | A5E00078060 |
| for replacement of electronics, measuring cell and connection board (only available from the Internet ¹⁾) | |
| HART modem | |
| <ul style="list-style-type: none"> • with RS232 interface ▶ 7MF4997-1DA • with USB interface ▶ 7MF4997-1DB | |
| Supplementary electronics for 4-wire connection | See page 1/159 |
| ▶ Available ex stock | |

Power supply units see Chap. 7 "Supplementary Components".

¹⁾ You can download these operating instructions free-of-charge from our Internet site at www.siemens.com/sitransp.