

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P DS III

Technical description

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 measuring spans 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.

Pressure transmitter for gauge pressure

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

Measuring 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.

Measuring span (infinitely adjustable)

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

Nominal measuring range

for DS III with PROFIBUS PA and FOUNDATION Fieldbus:

250 mbar a ... 100 bar a (3.6 ... 1450 psi a)

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"))

Measuring 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.

Measuring 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)

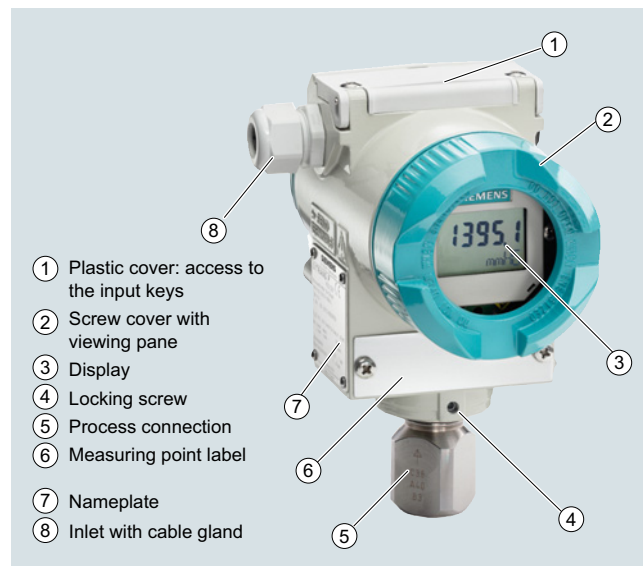
Nominal diameter of the mounting flange

- 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.

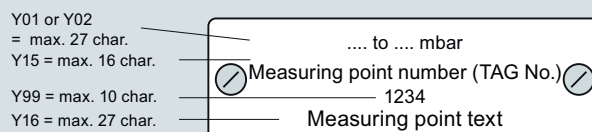
The rating plate (7, Figure "Front view") with the Article No. is located on the side of the enclosure. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

The approval label is located on the opposite side.

The enclosure 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 enclosure. 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 enclosure.

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the enclosure 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 enclosure is a plastic cover (1), which hides the input keys.

Example for an attached measuring point label

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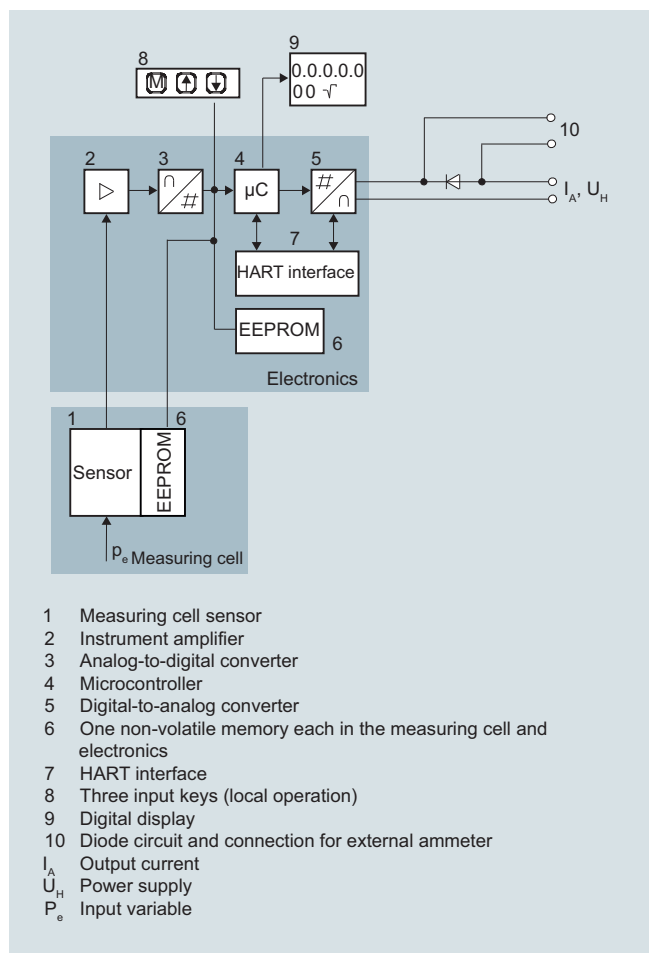
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Technical description

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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 a 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.

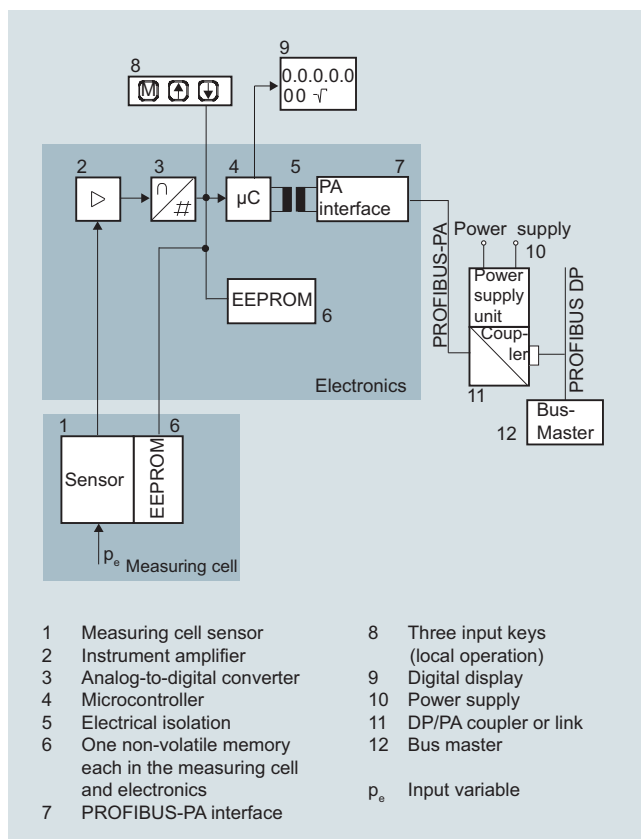
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced 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 measuring spans ≤ 63 bar measure the input pressure compared to atmosphere, transmitters with measuring spans ≥ 160 bar compared to vacuum.

Operation of electronics with PROFIBUS PA communication



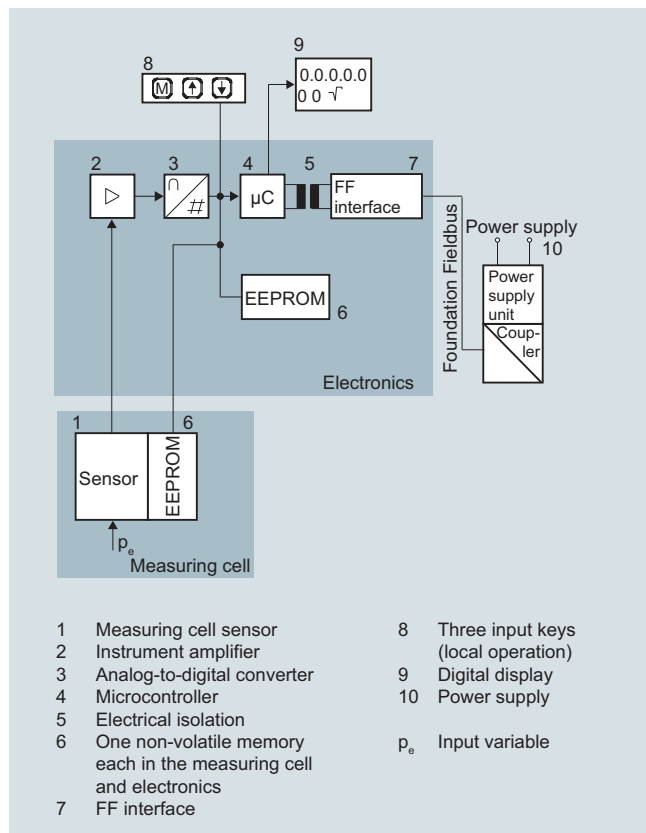
Function diagram of electronics

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.

Operation of electronics with FOUNDATION Fieldbus communication

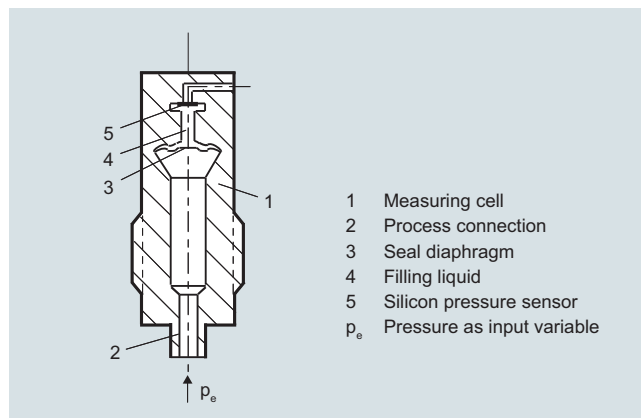
Function diagram of electronics

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.

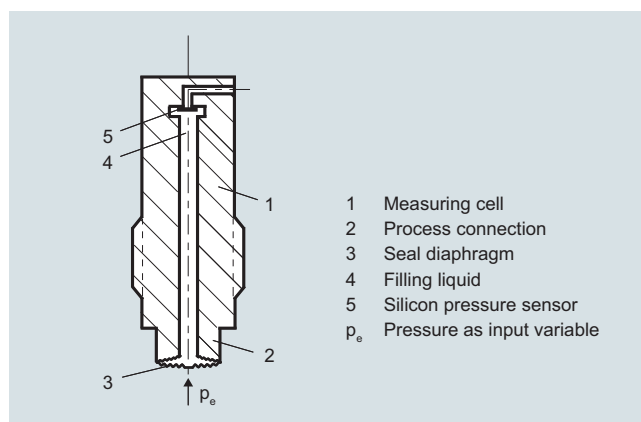
Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

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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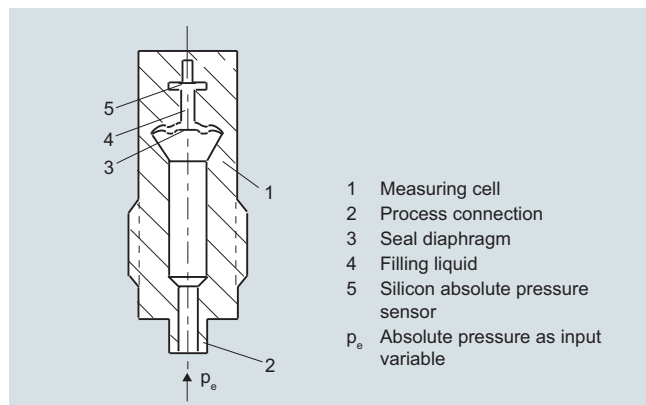
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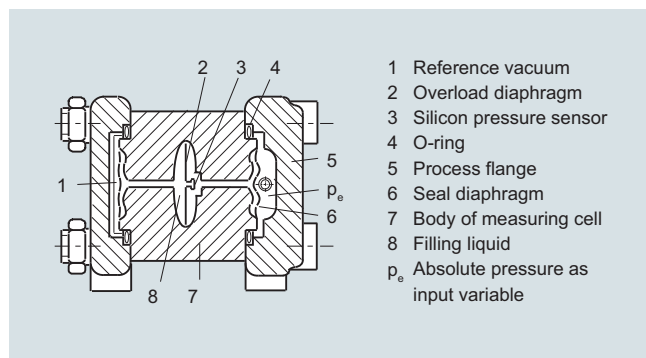
Measuring cell for absolute pressure from gauge pressure series



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



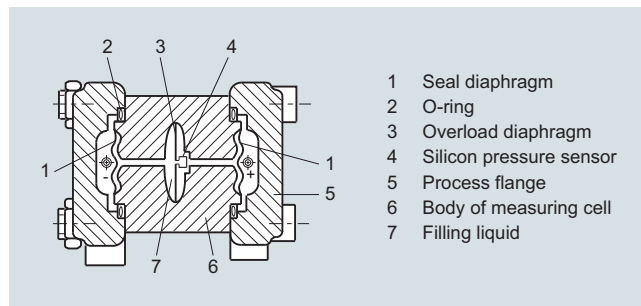
Measuring cell for absolute pressure from differential pressure series, function diagram

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



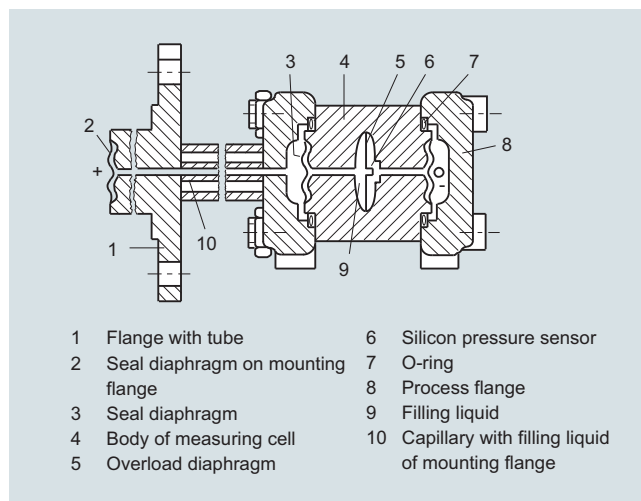
Measuring cell for differential pressure and flow, function diagram

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 differential 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.

Parameterization DS III

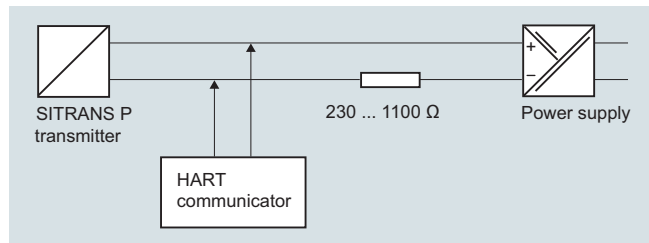
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

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

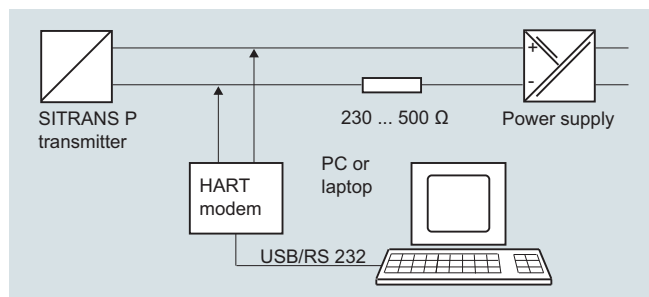
Parameterization using HART

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
Lower range value	x	x
Upper range value	x	x
Electrical damping	x	x
Lower range value without application of a pressure ("Blind setting")	x	x
Upper range 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	%

Technical specifications

SITRANS P, DS III series for gauge pressure

Input

Measured variable

Measuring span (fully adjustable) or nominal measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

(for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)

Gauge pressure

HART

PROFIBUS PA/
FOUNDATION
Fieldbus

Measuring span

Nominal measuring
rangeMax. operating pres-
sure MAWP (PS)Max. perm.
test pressure

8.3 ... 250 mbar
0.83 ... 25 kPa
0.12 ... 3.6 psi

250 mbar
25 kPa
3.6 psi

4 bar
400 kPa
58 psi

6 bar
600 kPa
87 psi

0.01 ... 1 bar
1 ... 100 kPa
0.15 ... 14.5 psi

1 bar
100 kPa
14.5 psi

4 bar
400 kPa
58 psi

6 bar
600 kPa
87 psi

0.04 ... 4 bar
4 ... 400 kPa
0.58 ... 58 psi

4 bar
400 kPa
58 psi

7 bar
0.7 MPa
102 psi

10 bar
1 MPa
145 psi

0.16 ... 16 bar
16 ... 1600 kPa
2.3 ... 232 psi

16 bar
1600 kPa
232 psi

21 bar
2.1 MPa
305 psi

32 bar
3.2 MPa
464 psi

0.63 ... 63 bar
63 ... 6300 kPa
9.1 ... 914 psi

63 bar
6300 kPa
914 psi

67 bar
6.7 MPa
972 psi

100 bar
10 MPa
1450 psi

1.6 ... 160 bar
0.16 ... 16 MPa
23 ... 2321 psi

160 bar
16 MPa
2321 psi

167 bar
16.7 MPa
2422 psi

250 bar
25 MPa
3626 psi

4 ... 400 bar
0.4 ... 40 MPa
58 ... 5802 psi

400 bar
40 MPa
5802 psi

400 bar
40 MPa
5802 psi

600 bar
60 MPa
8702 psi

7 ... 700 bar
0.7 ... 70 MPa
102 ... 10153 psi

700 bar
70 MPa
10153 psi

800 bar
80 MPa
11603 psi

800 bar
80 MPa
11603 psi

Lower measuring limit

(for 250mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.)

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

Upper measuring limit

30 mbar a/3 kPa a/0.44 psi a

30 mbar a/3 kPa a/0.44 psi a

100% of max. measuring span (max. 100 bar/10 MPa/1450 psi for oxygen measurement) ambient temperature/temperature of medium 60 °C (140 °F)

Output

Output signal

HART

PROFIBUS PA/FOUNDATION Fieldbus

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION
Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

-

23 mA, factory preset to 20.5 mA or
optionally set to 22.0 mA

-

Load

- Without HART

$$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$$

U_H : Power supply in V

-

- With HART

$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) bzw.
 $R_B = 230 \dots 1100 \Omega$ (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)

Pressure Measurement

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for gauge pressure

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SITRANS P, DS III series for gauge pressure

Measuring accuracy

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nominal measuring range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

$r \leq 1.25$: ≤ 0.065 %
 $1.25 < r \leq 30$: $\leq (0.008 \cdot r + 0.055)$ %

- 1 bar/100 kPa/14.5 psi
 4 bar/400 kPa/58 psi
 16 bar/1.6 MPa/232 psi
 63 bar/6.3 MPa/914 psi
 160 bar/16 MPa/2321 psi

$r \leq 5$: ≤ 0.065 %
 $5 < r \leq 100$: $\leq (0.004 \cdot r + 0.045)$ %

- 400 bar/40 MPa/5802 psi
 700 bar/70 MPa/10152 psi

$r \leq 3$: ≤ 0.075 %
 $3 < r \leq 10$: $\leq (0.0029 \cdot r + 0.071)$ %
 $10 < r \leq 100$: $\leq (0.005 \cdot r + 0.05)$ %

Influence of ambient temperature
 (in percent per 28 °C (50 °F))

- 250 mbar/25 kPa/3.6 psi

$\leq (0.16 \cdot r + 0.1)$ %

- 1 bar/100 kPa/14.5 psi

$\leq (0.05 \cdot r + 0.1)$ %

- 4 bar/400 kPa/58 psi
 16 bar/1.6 MPa/232 psi
 63 bar/6.3 MPa/914 psi
 160 bar/16 MPa/2321 psi
 400 bar/40 MPa/5802 psi

$\leq (0.025 \cdot r + 0.125)$ %

- 700 bar/70 MPa/10152 psi

$\leq (0.08 \cdot r + 0.16)$ %

Long-term stability (temperature change ± 30 °C (± 54 °F))

- 250 mbar/25 kPa/3.6 psi

$\leq (0.25 \cdot r)$ % per year

- 1 bar/100 kPa/14.5 psi
 4 bar/400 kPa/58 psi

$\leq (0.25 \cdot r)$ % in 5 years

- 16 bar/1.6 MPa/232 psi
 63 bar/6.3 MPa/914 psi
 160 bar/16 MPa/2321 psi
 400 bar/40 MPa/5802 psi

$\leq (0.125 \cdot r)$ % in 5 years

- 700 bar/70 MPa/10152 psi

$\leq (0.25 \cdot r)$ % in 5 years

Effect of mounting position

≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° inclination
 (zero point correction is possible with position error compensation)

Effect of auxiliary power supply
 (in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and
 FOUNDATION Fieldbus

$3 \cdot 10^{-5}$ of nominal measuring range

SITRANS P, DS III series for gauge pressure**Operating conditions**

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

-40 ... +100 °C (-40 ... +212 °F)

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

-40 ... +85 °C (-40 ... +185 °F)

- 160 bar/16 MPa/2321 psi
- 400 bar/40 MPa/5802 psi
- 700 bar/70 MPa/10152 psi

-20 ... +100 °C (-4 ... +212 °F)

- Measuring cell with Neobee fill fluid (FDA-compliant)
- In conjunction with dust explosion protection

-10 ... +100 °C (+14 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- Ambient temperature (silicone oil and inert oil)

- Transmitter
- Display readable

-40 ... +85 °C (-40 ... +185 °F)

-30 ... +85 °C (-22 ... +185 °F)

- Ambient temperature (Neobee fill fluid)

- Transmitter

-10 ... +85 °C (+14 ... +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)

Die-cast aluminum: ≈ 2.0 kg (≈ 4.4 lb)
Stainless steel precision casting: ≈ 4.6 kg (≈ 10.1 lb)

Enclosure material

Low-copper die-cast aluminum, GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

- Connection shank
- Oval flange
- Seal diaphragm

Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4602

Stainless steel, mat. no. 1.4404/316L

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 DIN EN 837-1, female thread $\frac{1}{2}$ -14 NPT or oval flange (PN 160 (MAWP 2320 psi)) to DIN 19213 with mounting thread M10 or $\frac{7}{16}$ -20 UNF to IEC 61518/DIN EN 61518

Material of mounting bracket

- Steel
- Stainless steel 304
- Stainless steel 316L

Sheet-steel, Mat. No. 1.0330, chrome-plated

Sheet stainless steel, mat. no. 1.4301 (SS 304)

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

Power supply U_H

Terminal voltage on transmitter

HART10.5 ... 45 V DC
10.5 ... 30 V DC in intrinsically-safe mode**PROFIBUS PA/FOUNDATION Fieldbus**

-

Power supply

-

Supplied through bus

Separate supply voltage

-

Not necessary

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

-

9 ... 32 V

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

-

-

12.5 mA

Yes

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

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SITRANS P, DS III series for gauge pressure	HART	PROFIBUS PA/ FOUNDATION Fieldbus
Certificates and approvals		
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection	PTB 13 ATEX 2007 X	
• Intrinsic safety "i"	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Marking	-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	
- Permissible ambient temperature	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$	
- Connection	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 174 \text{ mA}$, $P_o = 1 \text{ W}$ $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
- Effective internal inductance/capacitance	PTB 99 ATEX 1160	
• Explosion-proof "d"	Ex II 1/2 G Ex d IIC T4/T6 Gb	
- Marking	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Permissible ambient temperature	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	
- Connection	PTB 01 ATEX 2055	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Marking	-40 ... +85 °C (-40 ... +185 °F)	
- Permissible ambient temperature	120 °C (248 °F)	
- Max. surface temperature	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	
- Connection	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1 \text{ W}$ $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
- Effective internal inductance/capacitance	PTB 01 ATEX 2055	
• Dust explosion protection for zone 21/22	Ex II 2 D Ex tb IIIC T120°C Db	
- Marking	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$	
- Connection	PTB 13 ATEX 2007 X	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$
• Type of protection "n" (zone 2)	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Marking	$U_m = 45 \text{ V}$	
- Connection (Ex nA)	To circuits with values: $U_i = 45 \text{ V}$	
- Connections (Ex ic)	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$U_m = 32 \text{ V}$ FISCO supply unit ic: $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$ $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
- Effective internal inductance/capacitance	Certificate of Compliance 3008490	
• Explosion protection acc. to FM	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	
- Identification (XP/DIP) or (IS); (NI)	Certificate of Compliance 1153651	
• Explosion protection to CSA	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	
- Identification (XP/DIP) or (IS)		

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	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
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		
- 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		

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

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Selection and Ordering data		Article No.
Pressure transmitter for gauge pressure, SITRANS P DS III with HART		7MF4033 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	Measuring cell cleaning	
Silicone oil	normal	1
Inert liquid ¹⁾	grease-free to cleanliness level 2	3
FDA compliant fill fluid ²⁾		
• Neobee oil	normal	4
Measuring span (min. ... max.)		
8.3 ... 250 mbar	(0.12 ... 3.6 psi)	A
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 for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT" (recommended version) ^{3) 4) 5) 6)}		Y 1
Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" ^{3) 4) 5) 6)}		Y 0
Process connection		
• Connection shank G1/2B to EN 837-1		0
• Female thread 1/2-14 NPT		1
• Stainless steel oval flange with process connection (Oval flange has no female thread)		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN 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 1/2-14 NPT		6
Non-wetted parts materials		
• Enclosure made of die-cast aluminium		0
• Enclosure stainless steel precision casting ⁷⁾		3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		

Selection and Ordering data		Article No.
Pressure transmitter for gauge pressure, SITRANS P DS III with HART		7MF4033 -
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⁾¹¹⁾		R
• FM + CSA intrinsic safe (is) ¹²⁾		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D ⁹⁾¹¹⁾¹²⁾		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)" ⁸⁾¹²⁾		NC
Electrical connection / cable entry		
• Screwed gland M20 x1 .5		B
• Screwed gland 1/2-14 NPT		C
• Device plug Han 7D (plastic enclosure) incl. mating connector ¹³⁾		D
• Device plugs M12 (stainless steel) ¹³⁾¹⁴⁾		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".		
A quick-start guide is included in the scope of delivery of the device.		
¹⁾ For oxygen application, add Order code E10. ²⁾ Available for measuring ranges 1 ... 63 bar. ³⁾ When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here. ⁴⁾ If the inspection 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 7MF403-...Y-... and 7MF4900-1-...-B ⁶⁾ The standard measuring cell filling of configurations with remote seals (Y) is silicone oil. ⁷⁾ Not in conjunction with Electrical connection "Device plug Han 7D". ⁸⁾ Without cable gland, with blanking plug ⁹⁾ With enclosed cable gland Ex ia and blanking plug ¹⁰⁾ Configurations with device plugs Han and M12 are only available in Ex ic. ¹¹⁾ Only in connection with IP66. ¹²⁾ Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505. ¹³⁾ Only in connection with Ex approval A, B or E. ¹⁴⁾ M12 delivered without cable socket		

Selection and Ordering data		Article No.
Pressure transmitter for gauge pressure		
SITRANS P DS III with PROFIBUS PA (PA)		7 MF 4 0 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 MF 4 0 3 5 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	Measuring cell cleaning	
Silicone oil	normal	1
Inert liquid ¹⁾	grease-free to cleanliness level 2	3
FDA compliant fill fluid ²⁾		
• Neobee oil	normal	4
Nominal measuring range		
250 mbar	(3.6 psi)	A
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 for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT" (recommended version) ^{3) 4) 5) 6)}		Y 1
Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" ^{3) 4) 5) 6)}		Y 0
Process connection		
• Connection shank G1/2B to EN 837-1		0
• Female thread 1/2-14 NPT		1
• Stainless steel oval flange with process connection (Oval flange has no female thread) ⁷⁾		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN 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 1/2-14 NPT		6
Non-wetted parts materials		
• Enclosure made of die-cast aluminium		0
• Enclosure stainless steel precision casting		3
Version		
• Standard version, German label inscription, setting of pressure unit: bar		1
• International version, English label inscription, setting of pressure unit: psi		2
• Chinese version, English label inscription, setting of pressure unit: kPa		3
All versions include DVD with compact operating instructions in various EU languages.		

Selection and Ordering data		Article No.
Pressure transmitter for gauge pressure		
SITRANS P DS III with PROFIBUS PA (PA)		7 MF 4 0 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 MF 4 0 3 5 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Explosion protection		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)" ⁸⁾		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) 11)}		R
• FM + CSA intrinsic safe (is)" ¹²⁾		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D)" ^{9) 11) 12)}		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)" ^{8) 12)}		NC
Electrical connection/cable entry		
• Screwed gland M20 x 1.5		B
• Screwed gland 1/2-14 NPT		C
• Device plugs M12 (stainless steel)" ^{13) 14)}		F
Display		
• Without display		0
• Without visible display (display concealed, setting: bar)		1
• With visible display (setting: bar)		6
• with customer-specific display (setting as specified, Order code "Y21" required)		7
A quick-start guide is included in the scope of delivery of the device.		
1) For oxygen application, add Order code E10.		
2) Available for measuring ranges 1 ... 63 bar.		
3) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.		
4) If the inspection 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 7MF403-...Y... and 7MF4900-1...-B		
6) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.		
7) M10 fastening thread: Max. measuring span 160 bar (2320 psi) 7/16-20 UNF and M12 fastening thread: Max. measuring span 400 bar (5802 psi)		
8) Without cable gland, with blanking plug.		
9) With enclosed cable gland Ex ia and blanking plug.		
10) Configurations with device plugs Han and M12 are only available in Ex ic.		
11) Only in connection with IP66.		
12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
13) M12 delivered without cable socket.		
14) Only in connection with Ex approval A, B, E or F.		

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

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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 304	A02	✓	✓	✓	
• Stainless steel 316L	A03	✓	✓	✓	
Device plugs¹⁾					
• Han 7D (metal)	A30	✓			
• Han 8D (instead of Han 7D)	A31	✓			
• Angled	A32	✓			
• Han 8D (metal)	A33	✓			
Cable sockets for device plugs M12 (metal (CuZn))	A50	✓	✓	✓	
Rating plate inscription (instead of German)					
• English	B11	✓	✓	✓	
• French	B12	✓	✓	✓	
• Spanish	B13	✓	✓	✓	
• Italian	B14	✓	✓	✓	
• Cyrillic (russian)	B16	✓	✓	✓	
English rating plate Pressure units in inH ₂ O and/or psi	B21	✓	✓	✓	
Quality test certificate, 5-point factory calibration (IEC 60770-2)²⁾	C11	✓	✓	✓	
Inspection certificate³⁾ Acc. to EN 10204-3.1	C12	✓	✓	✓	
Factory certificate Acc. to EN 10204-2.2	C14	✓	✓	✓	
Inspection certificate (EN 10204-3.1) PMI test of parts in contact with medium	C15	✓	✓	✓	
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 ⁴⁾		✓		
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓			
PED for Russia with initial calibration mark	C99	✓	✓	✓	
Setting of the upper saturation limit of the output signal to 22.0 mA	D05	✓			
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)	D07	✓	✓	✓	
Degree of protection IP66/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	✓	✓	✓	
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	D59	✓	✓	✓	
Use in or on zone 1D/2D⁵⁾ (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)	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	✓	✓	✓	

Selection and Ordering data		Order code			
Further designs Add "-Z" to Article No. and specify Order code.			HART	PA	FF
CRN approval Canada (Canadian Registration Number)		E22 ⁶⁾	✓	✓	✓
Dual seal		E24	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..)		E25 ⁷⁾	✓	✓	✓
"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..)		E26 ⁷⁾	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..)		E28 ⁷⁾	✓	✓	
Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..)		E45 ⁷⁾	✓	✓	✓
Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-D..)		E46 ⁷⁾	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)		E5 ⁷⁾	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)		E56 ⁷⁾	✓	✓	✓
Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)		E57 ⁷⁾	✓	✓	✓
Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China) (only for transmitter 7MF4...-.....-R..)		E58 ⁷⁾	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)		E70 ⁷⁾	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia) (only for transmitter 7MF4...-.....-B..)		E80	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia) (only for transmitter 7MF4...-.....-D..)		E81	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia) (only for transmitter 7MF4...-.....-E..)		E82	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia) (only for transmitter 7MF4...-.....-R..)		E83	✓	✓	✓
Two coats of lacquer on enclosure and cover (PU on epoxy)		G10	✓	✓	✓
Transient protector 6 kV (lightning protection)		J01	✓	✓	✓
Process connection Astava		J06	✓	✓	✓

Selection and Ordering data		Order code			
Further designs Add "-Z" to Article No. and specify Order code.			HART	PA	FF
Marine approvals					
• Det Norske Veritas Germanischer Lloyd (DNV-GL)		S10	✓	✓	✓
• Lloyds Register (LR)		S11	✓	✓	✓
• French marine classification society Bureau Veritas (BV)		S12	✓	✓	✓
• American Bureau of Shipping (ABS)		S14	✓	✓	✓
• Russian Maritime Register (RMR)		S16	✓	✓	✓
• Korean Register of Shipping (KR)		S17	✓	✓	✓
1) Device plug Han IP65					
2) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.					
3) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.					
4) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H					
5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.					
6) Cannot be ordered with remote seal.					
7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.					
Selection and Ordering data		Order code			
Additional data Please add "-Z" to Article No. and specify Order code(s) and plain text.			HART	PA	FF
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 ²⁾	✓	✓	✓
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 units³⁾ 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) Factory mounting of valve manifolds, see accessories. Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset ✓ = available		Y30	✓	✓	✓

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) If you do not wish to have any text engraved for Y15, then do not make any further text entries as "Y15:".
 3) Preset values can only be changed over SIMATIC PDM.

Pressure Measurement

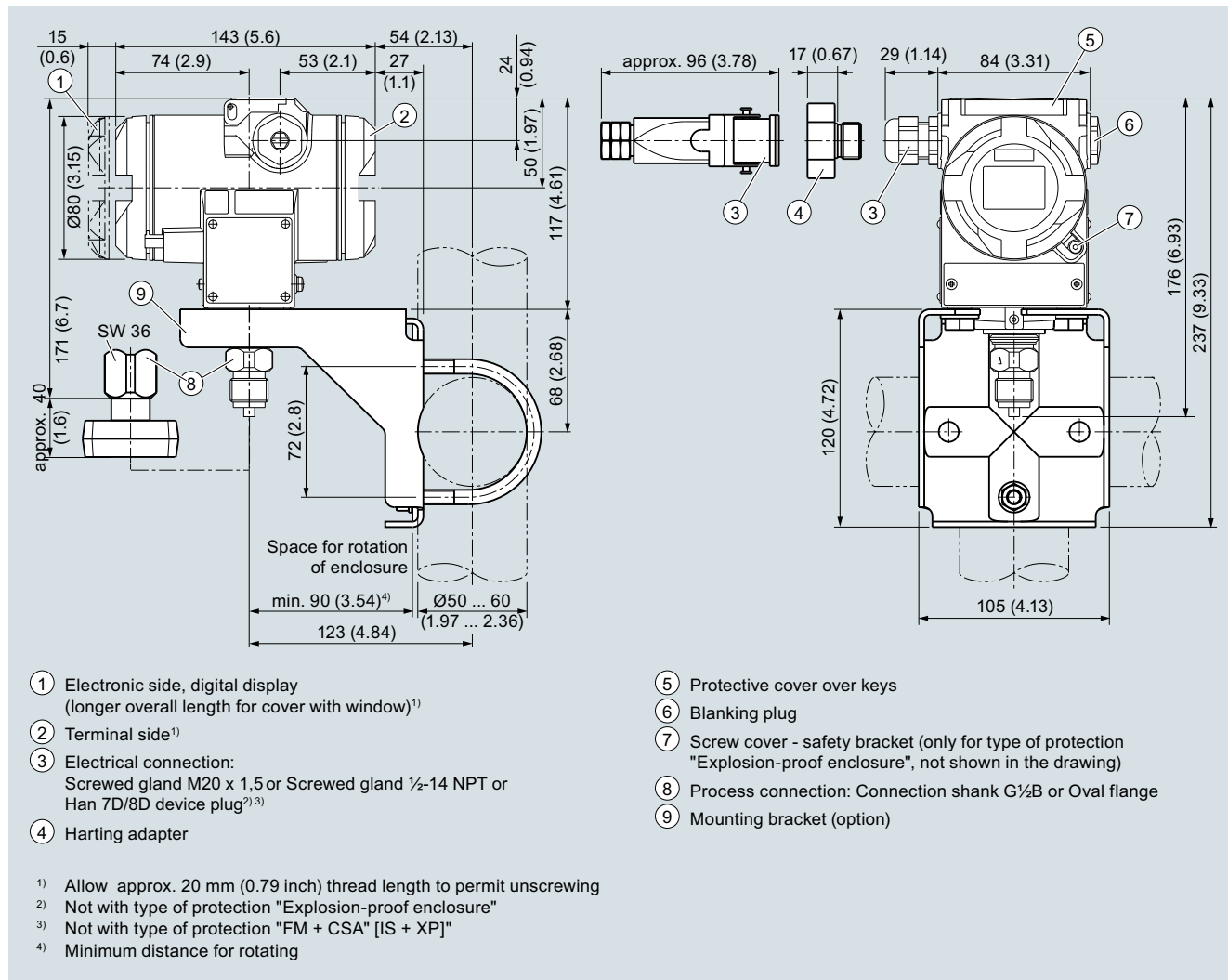
Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

Dimensional drawings



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

Technical specifications

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

Input of gauge pressure, with front-flush diaphragm

Measured variable

Measuring span (continuously adjustable) or nominal measuring range, max. operating pressure and max. test pressure

Gauge pressure, front-flush

HART

PROFIBUS PA/
FOUNDATION
Fieldbus

Measuring span

Nominal measuring range

Max. operating pressure MAWP (PS)

Max. perm. test pressure

0.01 ... 1 bar
1 ... 100 kPa
0.15 ... 14.5 psi1 bar
100 kPa
14.5 psi4 bar
400 kPa
58 psi6 bar
600 kPa
87 psi)0.04 ... 4 bar
4 ... 400 kPa
0.58 ... 58 psi4 bar
400 kPa
58 psi7 bar
0.7 MPa
102 psi10 bar
1 MPa
145 psi0.16 ... 16 bar
16 ... 1600 kPa
2.3 ... 232 psi16 bar
1600 kPa
232 psi21 bar
2.1 MPa
305 psi32 bar
3.2 MPa
464 psi0.63 ... 63 bar
63 ... 6300 kPa
9.1 ... 914 psi63 bar
6300 kPa
914 psi67 bar
6.7 MPa
972 psi100 bar
10 MPa
1450 psi

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
- Measuring cell with Neobee

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

Upper measuring limit

100 % of max. measuring span

Input of absolute pressure, with front-flush diaphragm

Measured variable

Measuring span (continuously adjustable) or nominal measuring range, max. operating pressure and max. test pressure

Absolute pressure, front-flush

HART

PROFIBUS PA/
FOUNDATION
Fieldbus

Measuring span

Nominal measuring range

Max. operating pressure MAWP (PS)

Max. perm. test pressure

43.34 ... 1300 mbar a
4.33 ... 130 kPa a
17 ... 525 inH₂O a1300 mbar a
130 kPa a
525 inH₂O a2.6 bar a
260 kPa a
37.7 psi a10 bar a
1 MPa a
145 psi a160 ... 5000 mbar a
16 ... 500 kPa a
2.32 ... 72.5 psi a5000 mbar a
500 kPa a
72.5 psi a10 bar a
1 MPa a
145 psi a30 bar a
3 MPa a
435 psi a1 ... 30 bar a
0.1 ... 3 MPa a
14.6 ... 435 psi a30 bar a
3 MPa a
435 psi a45 bar a
4.5 MPa a
653 psi a100 bar a
10 MPa a
1450 psi a

Lower measuring limit

0 mbar a/0 kPa a/0 psi a

Upper measuring limit

100 % of max. measuring span

Output

HART

PROFIBUS PA/FOUNDATION Fieldbus

Output signal

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

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)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

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

Measuring accuracy

Reference conditions
(All error data refer always refer to the set span)

Acc. to IEC 60770-1

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nominal measuring range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

Gauge pressure, front-flush

Absolute pressure, front-flush

- $r \leq 5$

$\leq 0.075 \%$

-

- $5 < r \leq 100$

$\leq (0.005 \cdot r + 0.05) \%$

-

- $r \leq 10$

-

$\leq 0.2 \%$

- $10 < r \leq 30$

-

$\leq 0.4 \%$

Influence of ambient temperature (in percent per 28 °C (50 °F)) $\leq (0.08 \cdot r + 0.16) \%$

$\leq (0.16 \cdot r + 0.24) \%$

Effect of ambient temperature
(in pressure per temperature change)

- Temperature difference between medium temperature and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

Long-term stability (temperature change ± 30 °C (± 54 °F)) $\leq (0.25 \cdot r) \%$ in 5 years

Effect of mounting position (in pressure per change in angle) 0.4 mbar/0.04 kPa/0.006 per 10° inclination
(zero point correction is possible with position error compensation)

Effect of auxiliary power supply
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

$3 \cdot 10^{-5}$ of nominal measuring range

Operating conditions

Installation conditions

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

-40 ... +85 °C (-40 ... +185 °F)

- Transmitter

-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

- Condensation

Relative humidity 0 ... 100 %
Condensation permissible, suitable for use in the tropics

Degree of protection

- according to EN 60529

IP66 (optional IP66/IP68)

- according to NEMA 250

Type 4X

Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

Medium conditions

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 Neobee oil, with temp. decoupler (only for gauge pressure version with flush-mounted diaphragm)

-10 ... +200 °C (14 ... 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)

SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm**Design**

Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)
Enclosure material	Low-copper die-cast aluminum, GD-AlSi12 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	• 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 $\mu\text{-inch}$)/welds $R_a \leq 1.6 \mu\text{m}$ (64 $\mu\text{-inch}$) (Process connections acc. to 3A; R_a -values $\leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$)/welds $R_a \leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$))

Power supply U_H

	HART	PROFIBUS PA/FOUNDATION Fieldbus
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply	-	Supplied through bus
Separate supply voltage	-	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

Pressure transmitters

for applications with advanced requirements (Advanced)

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

Certificates and approvals

Classification according to PED 2014/68/EU

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, 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 Ex ta IIC T120°C Da
Ex II 1/2 D Ex ta/tb IIC T120°C Da/Db

- 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

Ex II 2 D Ex tb IIC T120°C Db

- 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 IIC T4/T5/T6 Gb/Gc
Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/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

Hygiene version

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

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

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 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	Measuring cell cleaning	
Silicone oil	normal	1
Inert liquid		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
43.34 ... 1300 mbar a ¹⁾	(0.63 ... 18.86 psi a ¹⁾)	S
0.17 ... 5 bar a ¹⁾	(2.43 ... 72.5 psi a ¹⁾)	T
1 ... 30 bar a ¹⁾	(4.35 ... 435 psi a 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		
• Enclosure made of die-cast aluminium		0
• Enclosure stainless steel precision casting		3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		
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) ⁵⁾		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D ⁵⁾⁶⁾⁷⁾		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)" ³⁾⁵⁾		NC
Electrical connection/cable entry		
• Inner thread M20 x 1.5		B
• Female thread ½-14 NPT		C
• Device plug Han 7D (plastic enclosure) incl. mating connector ⁸⁾		D
• Device plugs M12 (stainless steel) ^{9) 10)}		F

Selection and Ordering data		Article No.
Pressure transmitter for gauge and absolute pressure, front-flush diaphragm, SITRANS P DS III HART		7MF4133 -
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".		
A quick-start guide is included in the scope of delivery of the device.		
1) Not with temperature decoupler P00, 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) Configurations with device plugs Han and M12 are only available in Ex ic.		
5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
6) Only in connection with IP66.		
7) With enclosed cable gland Ex ia and blanking plug.		
8) Only in connection with Ex approval A, B or E.		
9) Only in connection with Ex approval A, B, E or F.		
10) M12 delivered without cable socket		

Selection and Ordering data		Article No.	
Pressure transmitter P for gauge and absolute pressure, front-flush diaphragm:			
SITRANS P DS III with PROFIBUS PA (PA)		7 M F 4 1 3 4 -	
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 M F 4 1 3 5 -	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring cell filling	Measuring cell cleaning		
Silicone oil	normal	1	
Inert liquid		3	
FDA compliant fill fluid			
• Neobee oil	normal	4	
Nominal measuring range			
1 bar	(14.5 psi)	B	
4 bar	(58 psi)	C	
16 bar	(232 psi)	D	
63 bar	(914 psi)	E	
1300 mbar a ¹⁾	(18.86 psi a ¹⁾)	S	
5 bar a ¹⁾	(72.5 psi a ¹⁾)	T	
30 bar a ¹⁾	(435 psi a 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			
• Enclosure made of die-cast aluminium		0	
• Enclosure stainless steel precision casting		3	
Version			
• Standard version, German plate inscription, setting for pressure unit: bar		1	
• International version, English plate inscription, setting for pressure unit: bar		2	
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3	
All versions include DVD with compact operating instructions in various EU languages.			
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) ⁵⁾		F	
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D ⁵⁾⁶⁾⁷⁾		S	
• With FM + CSA, Type of protection:			
- "Intrinsic Safe and Explosion Proof (is + xp)" ³⁾⁵⁾ (available soon)		NC	
Electrical connection/cable entry			
• Screwed gland M20 x 1.5		B	
• Screwed gland ½-14 NPT		C	
• Device plugs M12 (stainless steel) ^{8) 9)}		F	

Selection and Ordering data

Article No.

Pressure transmitter P for gauge and absolute pressure, front-flush diaphragm:

SITRANS P DS III with PROFIBUS PA (PA)

7 M F 4 1 3 4 -

SITRANS P DS III with FOUNDATION Fieldbus (FF)

7 M F 4 1 3 5 -

Display

- Without display
- Without visible display (display concealed, setting: bar)
- With visible display (setting: bar)
- With customer-specific display (setting as specified, Order code "Y21" required)

0

1

6

7

A quick-start guide is included in the scope of delivery of the device.

- 1) Not with temperature decoupler P00, not for process connections R01, 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) Configurations with device plugs Han and M12 are only available in Ex ic.
- 5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 6) Only in connection with IP66.
- 7) With enclosed cable gland Ex ia and blanking plug.
- 8) Only in connection with Ex approval A, B, E or F.
- 9) M12 delivered without cable socket

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

1

Selection and Ordering data		Order code			
Further designs Add "-Z" to Article No. and specify Order code.			HART	PA	FF
Device plugs¹⁾					
• Han 7D (metal)		A30	✓		
• Han 8D (instead of Han 7D)		A31	✓		
• Angled		A32	✓		
• Han 8D (metal)		A33	✓		
Cable sockets for device plugs M12 (metal (CuZn))		A50	✓	✓	✓
Rating plate inscription (instead of German)					
• English		B11	✓	✓	✓
• French		B12	✓	✓	✓
• Spanish		B13	✓	✓	✓
• Italian		B14	✓	✓	✓
• Cyrillic (russian)		B16	✓	✓	✓
English rating plate Pressure units in inH ₂ O and/or psi		B21	✓	✓	✓
Quality test certificate, 5-point factory calibration (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 ²⁾		✓	
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration		C23	✓		
PED for Russia with initial calibration mark		C99	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA		D05	✓		
Degree of protection IP66/IP68 (only for M20x1.5 and ½-14 NPT)		D12	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included		D59	✓	✓	✓
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 ³⁾	✓	✓	✓
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 d) (only for transmitter 7MF4...-.....-D..)		E46 ⁴⁾	✓	✓	✓

Selection and Ordering data		Order code			
Further designs Add "-Z" to Article No. and specify Order code.			HART	PA	FF
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⁾	✓	✓	✓
Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)		E57 ⁴⁾	✓	✓	✓
Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China) (only for transmitter 7MF4...-.....-R..)		E58 ⁴⁾	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)		E70 ⁴⁾	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)		E80	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)		E81	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)		E82	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)		E83	✓	✓	✓
Two coats of lacquer on enclosure and cover (PU on epoxy)		G10	✓	✓	✓
Transient protector 6 kV (lightning protection)		J01	✓	✓	✓
Flanges to EN 1092-1, Form B1					
• DN 25, PN 40 ⁵⁾		M11	✓	✓	✓
• DN 40, PN 40		M13	✓	✓	✓
• DN 40, PN 100		M23	✓	✓	✓
• DN 50, PN 16		M04	✓	✓	✓
• DN 50, PN 40		M14	✓	✓	✓
• DN 80, PN 16		M06	✓	✓	✓
• DN 80, PN 40		M16	✓	✓	✓
Flanges to ASME B16.5					
• Stainless steel flange 1" class 150 ⁵⁾		M40	✓	✓	✓
• Stainless steel flange 1½" class 150		M41	✓	✓	✓
• Stainless steel flange 2" class 150		M42	✓	✓	✓
• Stainless steel flange 3" class 150		M43	✓	✓	✓
• Stainless steel flange 4" class 150		M44	✓	✓	✓
• Stainless steel flange 1½" class 300		M46	✓	✓	✓
• Stainless steel flange 2" class 300		M47	✓	✓	✓
• Stainless steel flange 3" class 300		M48	✓	✓	✓
• Stainless steel flange 4" class 300		M49	✓	✓	✓
Threaded connector to DIN 3852-2, form A, thread to ISO 228					
• G ¾"-A, front-flush ⁶⁾		R01	✓	✓	✓
• G 1"-A, front-flush ⁶⁾		R02	✓	✓	✓
• G 2"-A, front-flush		R04	✓	✓	✓
Tank connection⁷⁾ Sealing is included in delivery					
• TG 52/50, PN 40		R10	✓	✓	✓
• TG 52/150, PN 40		R11	✓	✓	✓

Selection and Ordering data	Order code			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
Sanitary process connection according DIN 11851 (Dairy connection with slotted union nut)				
• DN 50, PN 25	N04	✓	✓	✓
• DN 80, PN 25	N06	✓	✓	✓
Tri-Clamp connection according DIN 32676/ISO 2852				
• DN 50/2", PN 16	N14	✓	✓	✓
• DN 65/2.5", PN 10	N15	✓	✓	✓
• Clamp 2" ISO 2852 PN 16	N22	✓	✓	✓
• Clamp 3" ISO 2852 PN 16	N23	✓	✓	✓
Varivent connection EHEDG compliant				
• Type N = 68 for Varivent enclosure DN 40 ... 125 and 1½" ... 6", PN 40	N28	✓	✓	✓
Temperature decoupler up to 200 °C⁸⁾ for version with front-flush diaphragm	P00	✓	✓	✓
Sanitary process connection to DRD				
• DN 50, PN 40	M32	✓	✓	✓
SMS socket with union nut				
• 2"	M67	✓	✓	✓
• 2½"	M68	✓	✓	✓
• 3"	M69	✓	✓	✓
SMS threaded socket				
• 2"	M73	✓	✓	✓
• 2½"	M74	✓	✓	✓
• 3"	M75	✓	✓	✓
IDF socket with union nut ISO 2853				
• 2"	M82	✓	✓	✓
• 2½"	M83	✓	✓	✓
• 3"	M84	✓	✓	✓
IDF threaded socket ISO 2853				
• 2"	M92	✓	✓	✓
• 2½"	M93	✓	✓	✓
• 3"	M94	✓	✓	✓
Sanitary process connection to NEUMO Bio-Connect screw connection EHEDG compliant				
• DN 50, PN 16	Q05	✓	✓	✓
• DN 65, PN 16	Q06	✓	✓	✓
• DN 80, PN 16	Q07	✓	✓	✓
• DN 100, PN 16	Q08	✓	✓	✓
• DN 2", PN 16	Q13	✓	✓	✓
• DN 2½", PN 16	Q14	✓	✓	✓
• DN 3", PN 16	Q15	✓	✓	✓
• DN 4", PN 16	Q16	✓	✓	✓
Sanitary process connection to NEUMO Bio-Connect flange connection EHEDG compliant				
• 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	✓	✓	✓

Selection and Ordering data	Order code			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
Sanitary process connection to NEUMO Bio-Connect clamp connection EHEDG compliant				
• 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	✓	✓	✓
Bio-Control sanitary process connection				
• DN 50, PN 16	Q53	✓	✓	✓
• DN 65, PN 16	Q54	✓	✓	✓
Sanitary process connection to NEUMO Bio-Connect S flange connection				
• DN 2", PN 16	Q72	✓	✓	✓
Aseptic threaded socket to DIN 11864-1 Form A				
• DN 50, PN 25	N33	✓	✓	✓
• DN 65, PN 25	N34	✓	✓	✓
• DN 80, PN 25	N35	✓	✓	✓
• DN 100, PN 25	N36	✓	✓	✓
Aseptic flange with notch to DIN 11864-2 Form A				
• DN 50, PN 16	N43	✓	✓	✓
• DN 65, PN 16	N44	✓	✓	✓
• DN 80, PN 16	N45	✓	✓	✓
• DN 100, PN 16	N46	✓	✓	✓
Aseptic flange with groove to DIN 11864-2 Form A				
• DN 50, PN 16	N43 + P11	✓	✓	✓
• DN 65, PN 16	N44 + P11	✓	✓	✓
• DN 80, PN 16	N45 + P11	✓	✓	✓
• DN 100, PN 16	N46 + P11	✓	✓	✓
Aseptic clamp with groove to DIN 11864-3 Form A				
• DN 50, PN 25	N53	✓	✓	✓
• DN 65, PN 25	N54	✓	✓	✓
• DN 80, PN 16	N55	✓	✓	✓
• DN 100, PN 16	N56	✓	✓	✓

1) Device plug Han IP65

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

3) Cannot be ordered with remote seal.

4) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

5) Special seal in Viton included in the scope of delivery. FKM; temperature range -20 ... +200 °C (-4 ... +392 °C)

6) Cannot be combined with Order code P00. Can only be ordered with silicone oil measuring cell filling.

7) The weldable socket can be ordered under accessories.

8) 3A and EHEDG compliant. The maximum permissible temperatures of the medium depend on the respective cell fillings (see medium conditions).

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

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 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 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

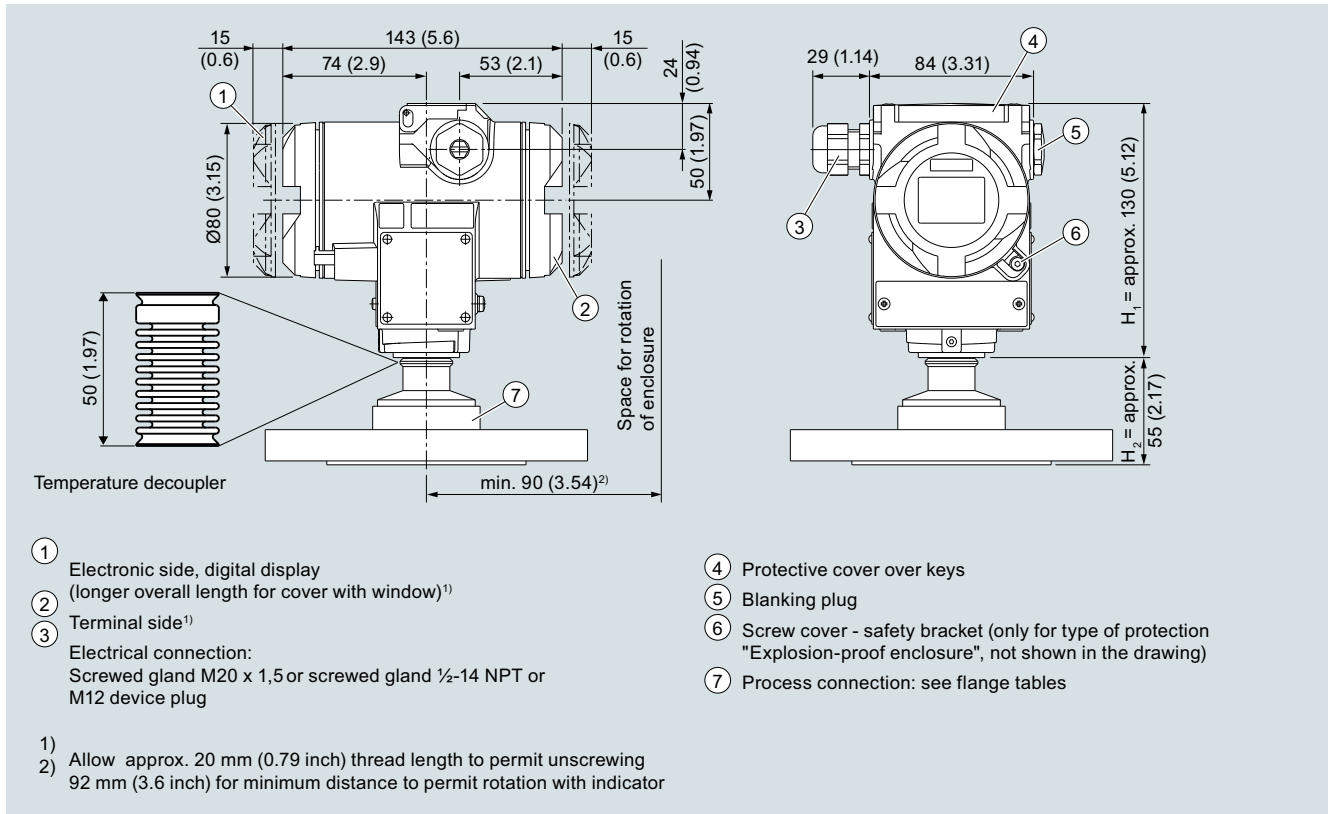
ordering example

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.

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

Pressure transmitters

for applications with advanced requirements (Advanced)

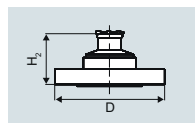
SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

Flanges according to EN and ASME

Flange according to EN

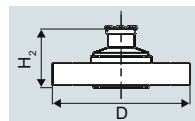
EN 1092-1



Order code	DN	PN	ØD	H ₂
M11	25	40	115 mm (4.5")	Approx. 52 mm (2")
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 according to ASME

ASME B16.5

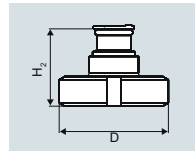


Order code	DN	PN	ØD	H ₂
M40	1"	150	110 mm (4.3")	Approx. 52 mm (2")
M41	1½"	150	130 mm (5.1")	
M42	2"	150	150 mm (5.9")	
M43	3"	150	190 mm (7.5")	
M44	4"	150	230 mm (9.1")	
M46	1½"	300	155 mm (6.1")	
M47	2"	300	165 mm (6.5")	
M48	3"	300	210 mm (8.1")	
M49	4"	300	255 mm (10.0")	

NuG and pharmaceutical connections

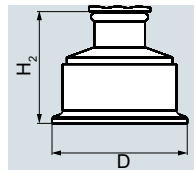
Connections to DIN

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")	

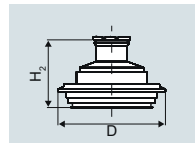
Tri-Clamp nach DIN 32676



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")	

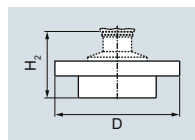
Other connections

Varivent connection



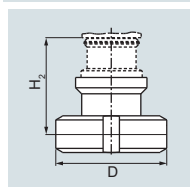
Order code	DN	PN	ØD	H ₂
N28	40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

Sanitary process connection to DRD



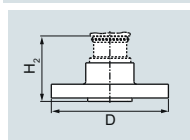
Order code	DN	PN	ØD	H ₂
M32	50	40	105 mm (4.1")	Approx. 52 mm (2")

Sanitary process screw connection to NEUMO Bio-Connect



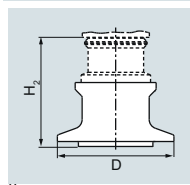
Order code	DN	PN	ØD	H ₂
Q05	50	16	82 mm (3.2")	Approx. 52 mm (2")
Q06	65	16	105 mm (4.1")	
Q07	80	16	115 mm (4.5")	
Q08	100	16	145 mm (5.7")	
Q13	2"	16	82 mm (3.2")	
Q14	2½"	16	105 mm (4.1")	
Q15	3"	16	105 mm (4.1")	
Q16	4"	16	145 mm (5.7")	

Sanitary process connection to NEUMO Bio-Connect flange connection



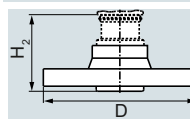
Order code	DN	PN	ØD	H ₂
Q23	50	16	110 mm (4.3")	Approx. 52 mm (2")
Q24	65	16	140 mm (5.5")	
Q25	80	16	150 mm (5.9")	
Q26	100	16	175 mm (6.9")	
Q31	2"	16	100 mm (3.9")	
Q32	2½"	16	110 mm (4.3")	
Q33	3"	16	140 mm (5.5")	
Q34	4"	16	175 mm (6.9")	

Sanitary process connection to NEUMO Bio-Connect clamp connection



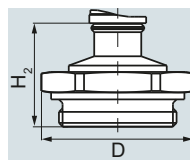
Order code	DN	PN	ØD	H ₂
Q39	50	16	77.4 mm (3.0")	Approx. 52 mm (2")
Q40	65	10	90.9 mm (3.6")	
Q41	80	10	106 mm (4.2")	
Q42	100	10	119 mm (4.7")	
Q48	2½"	16	90.9 mm (3.6")	
Q49	3"	10	106 mm (4.2")	
Q50	4"	10	119 mm (4.7")	

Sanitary process connection to NEUMO Bio-Connect S flange connection



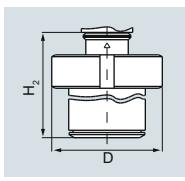
Order code	DN	PN	ØD	H ₂
Q72	2"	16	125 mm (4.9")	Approx. 52 mm (2")

Threaded connection G¾", G1" and G2" acc. to DIN 3852

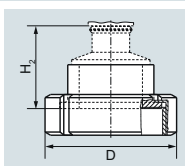


Order code	DN	PN	ØD	H ₂
R01	¾"	60	37 mm (1.5")	Approx. 45 mm (1.8")
R02	1"	60	48 mm (1.9")	Approx. 47 mm (1.9")
R04	2"	60	78 mm (3.1")	Approx. 52 mm (2")

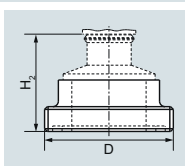
Tank connection TG 52/50 and TG52/150

	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")

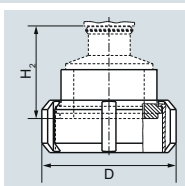
SMS socket with union nut

	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")	

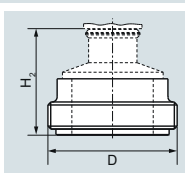
SMS threaded socket

	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	

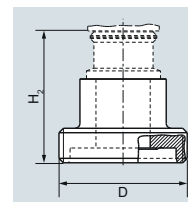
IDF socket with union nut

	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")	

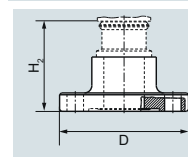
IDF threaded socket

	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")	

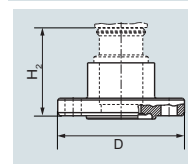
Aseptic threaded socket to DIN 11864-1 Form A

	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 1/4"	
	N36	100	25	130 x 1/4"	

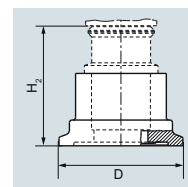
Aseptic flange with notch to DIN 11864-2 Form A

	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	

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	

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	

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from gauge pressure series)

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Technical specifications

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

Input

Measured variable

Measuring span (fully adjustable) or nominal measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

Absolute pressure

HART

PROFIBUS PA/ FOUNDATION Fieldbus

Measuring span

Nominal measuring range

Max. operating pressure MAWP (PS)

Max. perm. test pressure

8.34 ... 250 mbar a
0.83 ... 25 kPa a
3.35 ... 100 inH₂O a

250 mbar a
25 kPa a
100 inH₂O a

1.5 bar a
150 kPa a
21.8 psi a

6 bar a
600 kPa a
87 psi a

43.34 ... 1300 mbar a
4.33 ... 130 kPa a
17.42 ... 522.4 inH₂O a

1300 mbar a
130 kPa a
525 inH₂O a

2.6 bar a
260 kPa a
37.7 psi a

10 bar a
1 MPa a
145 psi a

170 ... 5000 mbar a
17 ... 500 kPa a
2.43 ... 72.5 psi a

5000 mbar a
500 kPa a
72.5 psi a

10 bar a
1 MPa a
145 psi a

30 bar a
3 MPa a
435 psi a

1 ... 30 bar a
0.1 ... 3 MPa a
14.6 ... 435 psi a

30 bar a
3 MPa a
435 psi a

45 bar a
4.5 MPa a
653 psi a

100 bar a
10 MPa a
1450 psi a

5.34 ... 160 bar a
0.53 ... 16 MPa a
77.4 ... 2321 psi a

160 bar a
16 MPa a
2321 psi

167 bar a
16.7 MPa a
2422 psi

250 bar a
25 MPa a
3626 psi

13.34 ... 400 bar a
1.3 ... 40 MPa a
193.4 ... 5802 psi a

400 bar a
40 MPa a
5802 psi a

400 bar a
40 MPa a
5802 psi a

600 bar a
60 MPa a
8702 psi a

23.34 ... 700 bar a
2.33 ... 70 MPa a
338.43 ... 10153 psi a

700 bar a
70 MPa a
10153 psi a

800 bar a
80 MPa a
11603 psi a

800 bar a
80 MPa a
11603 psi a

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

0 mbar a/0 kPa a/0 psi a

- for temperature of medium -20 °C < ϑ ≤ +60 °C
(-4 °F < ϑ ≤ +140 °F)

30 mbar a/3 kPa a/0.44 psi a

- for temperature of medium
60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar)
(140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))

30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C
3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C
0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F

Upper measuring limit

100 % of max. measuring span
(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F)
ambient temperature/temperature of medium)

Lower range value

Between the measuring limits (fully adjustable)

Output

Output signal

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

Load

- Without HART
- With HART

$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω ,
 U_H : Power supply in V

$R_B = 230 \dots 500 \Omega$ (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)

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

Reference conditions
(All error data refer always refer to the set span)

Acc. to IEC 60770-1

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nominal measuring range}$

Error in measurement at limit setting incl.
hysteresis and reproducibility

- Linear characteristic

- $r \leq 10$

$\leq 0.1 \%$

- $10 < r \leq 30$

$\leq 0.2 \%$

Influence of ambient temperature
(in percent per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a

$\leq (0.15 \cdot r + 0.1) \%$

- 1300 mbar a/130 kPa a/18.8 psi a
5 bar a/500 kPa a/72.5 psi a
30 bar a/3000 kPa a/435 psi a
100 bar a/10 MPa a/1450 psi a
160 bar a/16 MPa a/2321 psi a
400 bar a/40 MPa a/5802 psi a
700 bar a/50 MPa a/10152 psi a

$\leq (0.08 \cdot r + 0.16) \%$

Long-term stability (temperature change ± 30 °C (± 54 °F))

$\leq (0.25 \cdot r) \%$ in 5 years

Effect of mounting position (in pressure per change in angle)

$\leq 0.05 \text{ mbar}/0.005 \text{ kPa}/0.000725 \text{ psi}$ per 10° inclination
(zero point correction is possible with position error compensation)

Effect of auxiliary power supply
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and
FOUNDATION Fieldbus

$3 \cdot 10^{-5}$ of nominal measuring range

Operating conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling

-40 ... +100 °C (-40 ... +212 °F)

-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

- Transmitter

-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

Pressure Measurement

Pressure transmitters

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

Design

Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)
Enclosure material	Low-copper die-cast aluminum, GD-AlSi 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. 2.4602
• 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 EN 837-1, female thread ½ -14 NPT or oval flange (PN 160 (MAWP 2320 psi a)) to DIN 19213 with mounting thread M10 or 7/16-20 UNF to IEC 61518/DIN EN 61518
Material of mounting bracket	
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)

Power supply U_H

	HART	PROFIBUS PA/FOUNDATION Fieldbus
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate supply voltage	-	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

SITRANS P DS III series for absolute pressure (from the gauge pressure series)**Certificates and approvals**

Classification according to PED 2014/68/EU

Explosion protection

• Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

• Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

• Dust explosion protection for zone 20

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

• Dust explosion protection for zone 21/22

- Marking
- Connection

• Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

• Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

• Explosion protection to CSA

- Identification (XP/DIP) or (IS)

HART

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-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

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

 $U_m = 45 \text{ V}$

To circuits with values:
 $U_i = 45 \text{ V}$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

Certificate of Compliance 3008490

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

Certificate of Compliance 1153651

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

PROFIBUS PA/ FOUNDATION FieldbusFISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$ $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$ To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$
 Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$;
 $P_{\max} = 1 \text{ W}$

 $U_m = 32 \text{ V}$

FISCO supply unit ic:
 $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$
 Linear barrier:
 $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

Pressure Measurement

Pressure transmitters

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for absolute pressure (from gauge pressure series)

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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	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
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 to 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- 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		

Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
Pressure transmitters for absolute pressure from gauge pressure series SITRANS P DS III with HART		7MF4233-	Pressure transmitters for absolute pressure from gauge pressure series SITRANS P DS III with HART		7MF4233-
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			Electrical connection/cable entry		
Measuring cell filling	Measuring cell cleaning		• Screwed gland M20x1.5	B	
			• Screwed gland ½-14 NPT	C	
Silicone oil	normal	1	• Device plug Han 7D (plastic enclosure) incl. mating connector ¹⁴⁾	D	
Inert liquid ¹⁾	grease-free to cleanliness level 2	3	• Device plugs M12 (stainless steel) ^{15) 16)}	F	
Measuring span (min. ... max.)			Display		
8.34 ... 250 mbar a	(0.13 ... 3.63 psi a)	D	• Without display	0	
43.34 ... 1300 mbar a	(0.63 ... 18.86 psi a)	F	• Without visible display (display concealed, setting: mA)	1	
0.17 ... 5 bar a	(2.43 ... 72.5 psi a)	G	• With visible display (setting: mA)	6	
1 ... 30 bar a	(14.6 ... 435 psi a)	H	• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)	7	
5.34 ... 160 bar a ²⁾	(77.4 ... 2 321 psi a)	L			
13.34 ... 400 bar a ²⁾	(193.4 ... 5 802 psi a)	M			
23.34 ... 700 bar a ²⁾	(338.43 ... 10 153 psi a)	N			
Wetted parts materials			Power supply units see Chap. 7 "Supplementary Components".		
Seal diaphragm	Process connection		A quick-start guide is included in the scope of delivery of the device.		
Stainless steel	Stainless steel	A	1) For oxygen application, add Order code E10.		
Hastelloy	Stainless steel	B	2) Available soon		
Hastelloy	Hastelloy	C	3) Version 7MF4233-1DY... only up to max. measuring span 200 mbar a (80 inH ₂ O a).		
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" (recommended version) ^{3) 4) 5) 6) 7)}		Y 1	4) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.		
Version for diaphragm seals in conjunction with process connector "G½B connection shank" ^{3) 4) 5) 6) 7)}		Y 0	5) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
Process connection			6) 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		
• Connection shank G½B to EN 837-1		0	7) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.		
• Female thread ½-14 NPT		1	8) Not in conjunction with Electrical connection "device plug Han 7D".		
• Stainless steel oval flange with process connection (Oval flange has no female thread)			9) Without cable gland, with blanking plug.		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		2	10) With enclosed cable gland Ex ia and blanking plug.		
- Mounting thread M10 to DIN 19213		3	11) Configurations with device plugs Han and M12 are only available in Ex ic.		
- Mounting thread M12 to DIN 19213		4	12) Only in connection with IP66.		
• Male thread M20 x 1.5		5	13) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
• Male thread ½-14 NPT		6	14) Only in connection with Ex approval A, B or E.		
Non-wetted parts materials			15) Only in connection with Ex approval A, B, E or F.		
• Enclosure made of die-cast aluminium		0	16) M12 delivered without cable socket		
• Enclosure stainless steel precision casting ⁸⁾		3			
Version					
• Standard version, German plate inscription, setting for pressure unit: bar		1			
• International version, English plate inscription, setting for pressure unit: bar		2			
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3			
All versions include DVD with compact operating instructions in various EU languages.					
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⁾¹²⁾		R			
• FM + CSA intrinsic safe (is) ¹³⁾		F			
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D ¹⁰⁾¹²⁾¹³⁾		S			
• With FM + CSA, Type of protection:					
- "Intrinsic Safe and Explosion Proof (is + xp)" ⁹⁾¹³⁾		NC			

Pressure Measurement

Pressure transmitters

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SITRANS P DS III

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Selection and Ordering data		Article No.
Pressure transmitters for absolute pressure from gauge pressure series		
SITRANS P DS III with PROFIBUS PA (PA)		7 M F 4 2 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 M F 4 2 3 5 -
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	Measuring cell cleaning	
Silicone oil	normal	1
Inert liquid ¹⁾	grease-free to cleanliness level 2	3
Nominal measuring range		
250 mbar a	(3.63 psi a)	D
1300 mbar a	(18.86 psi a)	F
5 bar a	(72.5 psi a)	G
30 bar a	(435 psi a)	H
160 bar a ²⁾	(2 321 psi a)	L
400 bar a ²⁾	(5 802 psi a)	M
700 bar a ²⁾	(10 153 psi a)	N
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT" (recommended version) ^{3) 4) 5) 6) 7)}		Y 1
Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" ^{3) 4) 5) 6) 7)}		Y 0
Process connection		
• Connection shank G1/2B to EN 837-1		0
• Female thread 1/2-14 NPT		1
• Stainless steel oval flange with process connection (Oval flange has no female thread)		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN 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 1/2 -14 NPT		6
Non-wetted parts materials		
• Enclosure made of die-cast aluminium		0
• Enclosure stainless steel precision casting		3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		

Selection and Ordering data		Article No.
Pressure transmitters for absolute pressure from gauge pressure series		
SITRANS P DS III with PROFIBUS PA (PA)		7 M F 4 2 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 M F 4 2 3 5 -
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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) 11)}		R
• FM + CSA intrinsic safe (is) ¹²⁾		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D ^{9) 11) 12)}		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)" ^{8) 12)}		NC
Electrical connection/cable entry		
• Screwed gland M20 x 1.5		B
• Screwed gland 1/2-14 NPT		C
• Device plugs M12 (stainless steel) ^{13) 14)}		F
Display		
• Without display		0
• Without visible display (display concealed, setting: bar)		1
• With visible display (setting: bar)		6
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)		7
A quick-start guide is included in the scope of delivery of the device.		
1) For oxygen application, add Order code E10.		
2) Available soon		
3) Version 7MF4233-1DY... only up to max. measuring span 200 mbar a (2.9 psi a).		
4) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.		
5) If the inspection 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 7MF423-...Y... and 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 device plugs Han and M12 are only available in Ex ic.		
11) Only in connection with IP66.		
12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
13) Only in connection with Ex approval A, B, E or F.		
14) M12 delivered without cable socket.		

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 304	A02	✓	✓	✓
• Stainless steel 316L	A03	✓	✓	✓
Device plugs¹⁾				
• Han 7D (metal)	A30	✓		
• Han 8D (instead of Han 7D)	A31	✓		
• Angled	A32	✓		
• Han 8D (metal)	A33	✓		
Cable sockets for device plugs M12 (metal (CuZn))	A50	✓	✓	✓
Rating plate inscription (instead of German)				
• English	B11	✓	✓	✓
• French	B12	✓	✓	✓
• Spanish	B13	✓	✓	✓
• Italian	B14	✓	✓	✓
• Cyrillic (russian)	B16	✓	✓	✓
English rating plate	B21	✓	✓	✓
Pressure units in inH ₂ O and/or psi				
Quality test certificate, 5-point factory calibration (IEC 60770-2)²⁾	C11	✓	✓	✓
Inspection certificate³⁾	C12	✓	✓	✓
Acc. to EN 10204-3.1				
Factory certificate	C14	✓	✓	✓
Acc. to EN 10204-2.2				
Inspection certificate (EN 10204-3.1)	C15	✓	✓	✓
PMI test of parts in contact with medium				
Functional safety (SIL2)	C20	✓		
Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration				
Functional safety (PROFIsafe)	C21 ⁴⁾		✓	
Certificate and PROFIsafe protocol				
Functional safety (SIL2/3)	C23	✓		
Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration				
PED for Russia with initial calibration mark	C99	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA	D05	✓		
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)	D07	✓	✓	✓
Degree of protection IP66/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	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	D59	✓	✓	✓
Use in or on zone 1D/2D⁵⁾ (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP65)	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	✓	✓	✓

Selection and Ordering data	Order code			
Further designs		HART	PA	FF
Add "-Z" to Article No. and specify Order code.				
CRN approval Canada (Canadian Registration Number)	E22 ⁶⁾	✓	✓	✓
Dual seal	E24	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..)	E25 ⁷⁾	✓	✓	✓
"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..)	E26 ⁷⁾	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..)	E28 ⁷⁾	✓	✓	
Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..)	E45 ⁷⁾	✓	✓	✓
Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-D..)	E46 ⁷⁾	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)	E55 ⁷⁾	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)	E56 ⁷⁾	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)	E57 ⁷⁾	✓	✓	✓
Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China) (only for transmitter 7MF4...-.....-R..)	E58 ⁷⁾	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 ⁷⁾	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)	E80	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)	E81	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	E82	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	E83	✓	✓	✓
Two coats of lacquer on enclosure and cover (PU on epoxy)	G10	✓	✓	✓
Transient protector 6 kV (lightning protect.)	J01	✓	✓	✓
Oval flange NAM (ASTAVA)	J06	✓	✓	✓
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓	✓
• Lloyds Register (LR)	S11	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	S12	✓	✓	✓
• American Bureau of Shipping (ABS)	S14	✓	✓	✓
• Russian Maritime Register (RMR)	S16	✓	✓	✓
• Korean Register of Shipping (KR)	S17	✓	✓	✓

1) Device plug Han IP65

2) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.

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

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

5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

6) Cannot be ordered with remote seal.

7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

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 a, bar a, kPa _{abs} , MPa _{abs} , psi a ²⁾	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 units³⁾ 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.

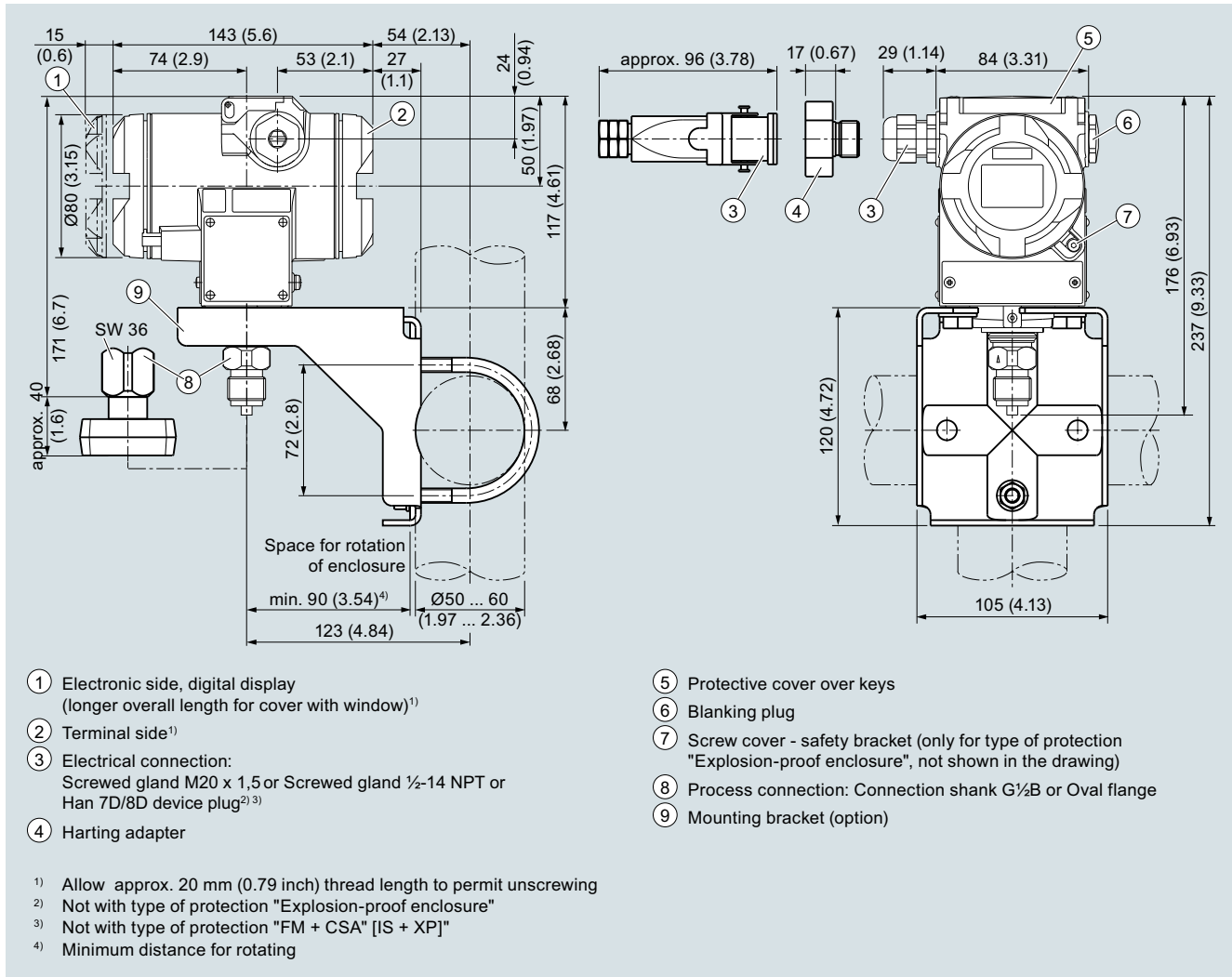
Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = available

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

²⁾ Only absolute pressure units selectable. Negative pressure values not permitted.

³⁾ Preset values can only be changed over SIMATIC PDM.

Dimensional drawings

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

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)

Input

Measured variable

Absolute pressure

Measuring span (infinitely adjustable) or nominal measuring range, max. operating pressure (in accordance with 97/23/EC Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

HART

PROFIBUS PA/ FOUNDATION Fieldbus

Measuring span

Nominal measuring range

Max. operating pressure MAWP (PS)

8.34 ... 250 mbar a
0.834 ... 25 kPa a
3 ... 100 inH₂O a

250 mbar a
25 kPa a
100 inH₂O a

32 bar a
3.2 MPa a
464 psi a

43.34 ... 1300 mbar a
4.33 ... 130 kPa a
17 ... 525 inH₂O a

1300 mbar a
130 kPa a
525 inH₂O a

32 bar a
3.2 MPa a
464 psi a

170 ... 5000 mbar a
17 ... 500 kPa a
2.43 ... 72.5 psi a

5000 mbar a
500 kPa a
72.5 psi a

32 bar a
3.2 MPa a
464 psi a

1 ... 30 bar a
0.1 ... 3 MPa a
14.6 ... 435 psi a

30 bar a
3 MPa a
435 psi a

160 bar a
16 MPa a
2320 psi a

5.3 ... 100 bar a
0.5 ... 10 MPa a
76.9 ... 1450 psi a

100 bar a
10 MPa a
1450 psi a

160 bar a
16 MPa a
2320 psi a

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

0 mbar a/0 kPa a/0 psi a

- for temperature of medium -20 °C < ϑ ≤ +60 °C
(-4 °F < ϑ ≤ +140 °F)

30 mbar a/3 kPa a/0.44 psi a

- for temperature of medium
60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar)
(140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))

30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C
3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C
0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F

Upper measuring limit

100 % of max. measuring span
(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F)
ambient temperature/temperature of medium)

Lower range value

Between the measuring limits (fully adjustable)

Output

HART

PROFIBUS PA/ FOUNDATION Fieldbus

Output signal

4 ... 20 mA

Digital PROFIBUS PA and
FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

-

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)

SITRANS P, DS III for absolute pressure (from the differential pressure series)**Measuring accuracy**

Reference conditions

(All error data refer always refer to the set span)

Acc. to IEC 60770-1

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nominal measuring range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- $r \leq 10$ $\leq 0.1 \%$ - $10 < r \leq 30$ $\leq 0.2 \%$

Influence of ambient temperature (in percent per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a

 $\leq (0.15 \cdot r + 0.1) \%$

- 1300 mbar a/130 kPa a/18.8 psi a

 $\leq (0.08 \cdot r + 0.16) \%$

5 bar a/500 kPa a/72.5 psi a

30 bar a/3000 kPa a/435 psi a

100 bar a/10 MPa a/1450 psi a

Long-term stability

(temperature change ± 30 °C (± 54 °F)) $\leq (0.25 \cdot r) \%$ in 5 years

Effect of mounting position (in pressure per change in angle)

 $\leq 0.7 \text{ mbar}/0.07 \text{ kPa}/0.010 \text{ psi}$ per 10° inclination
(zero point correction is possible with position error compensation)

Effect of auxiliary power supply (in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

 $3 \cdot 10^{-5}$ of nominal measuring range**Operating conditions**

Degree of protection

- according to EN 60529

IP66 (optional IP66/IP68)

- according to NEMA 250

Type 4X

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

-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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

1

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

Design

Weight (without options)	≈ 4.5 kg (≈ 9.9 (lb))
Enclosure material	Low-copper die-cast aluminum, GD-AlSi12 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. 2.4602 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/DIN EN 61518
Material of mounting bracket	
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)

Power supply U_H

	HART	PROFIBUS PA/FOUNDATION Fieldbus
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate supply voltage	-	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

SITRANS P, DS III for absolute pressure (from the differential pressure series)**Certificates and approvals**

Classification according to PED 2014/68/EU

Explosion protection

• Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

• Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

• Dust explosion protection for zone 20

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

• Dust explosion protection for zone 21/22

- Marking
- Connection

• Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

• Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

• Explosion protection to CSA

- Identification (XP/DIP) or (IS)

HART

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-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

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

 $U_m = 45 \text{ V}$

To circuits with values:
 $U_i = 45 \text{ V}$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

Certificate of Compliance 3008490

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

Certificate of Compliance 1153651

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

PROFIBUS PA/ FOUNDATION Field-bus

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values:
 $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$

 $U_m = 32 \text{ V}$

FISCO supply unit ic:
 $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$

Linear barrier:
 $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

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 to 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	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
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		
- 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		

Selection and Ordering data		Article No.	
Pressure transmitters for absolute pressure from differential pressure series, SITRANS P DS III with HART		7MF4333 -	
➔ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring cell filling	Measuring cell cleaning		
Silicone oil	normal	1	
Inert liquid ¹⁾	grease-free to cleanliness level 2	3	
Measuring span (min. ... max.)			
8.34 ... 250 mbar a	(0.13 ... 3.63 psi a)	D	
43.34 ... 1300 mbar a	(0.63 ... 18.86 psi a)	F	
0.17 ... 5 bar a	(2.43 ... 72.5 psi a)	G	
1 ... 30 bar a	(14.6 ... 435 psi a)	H	
5.3 ... 100 bar a	(76.9 ... 1450 psi a)	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 IEC 61518/DIN 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 IEC 61518/DIN EN 61518		6	
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		4	
Non-wetted parts materials			
process flange screws	Electronics enclosure		
Stainless steel	Die-cast aluminum	2	
Stainless steel	Stainless steel precision casting ⁸⁾	3	
Version			
• Standard version, German plate inscription, setting for pressure unit: bar		1	
• International version, English plate inscription, setting for pressure unit: bar		2	
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3	
All versions include DVD with compact operating instructions in various EU languages.			
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⁾¹²⁾		R	
• FM + CSA intrinsic safe (is) ¹³⁾		F	
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D ¹⁰⁾¹²⁾¹³⁾		S	
• With FM + CSA, Type of protection:			
- "Intrinsic Safe and Explosion Proof (is + xp)" ⁹⁾¹³⁾		NC	

Selection and Ordering data		Article No.	
Pressure transmitters for absolute pressure from differential pressure series, SITRANS P DS III with HART		7MF4333 -	
Electrical connection/cable entry			
• Screwed gland M20 x 1.5			B
• Screwed gland 1/2-14 NPT			C
• Device plug Han 7D (plastic enclosure) incl. mating connector ¹⁴⁾			D
• Device plugs M12 (stainless steel) ^{15) 16)}			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:			
• Quick-start guide			
• 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. measuring span 200 mbar a (2.9 psi a).			
3) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.			
4) If the inspection 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... and 7MF4900-1...-B			
6) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.			
7) Not for measuring span "5.3 ... 100 bar a (76.9 ... 1450 psi a)". Position of the top vent valve in the process flange (see dimensional drawing).			
8) Not in conjunction with Electrical connection "device plug Han 7D".			
9) Without cable gland, with blanking plug			
10) With enclosed cable gland Ex ia and blanking plug			
11) Configurations with device plugs Han and M12 are only available in Ex ic.			
12) Only in connection with IP66.			
13) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.			
14) Only in connection with Ex approval A, B or E.			
15) Only in connection with Ex approval A, B, E or F.			
16) M12 delivered without cable socket.			

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

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Selection and Ordering data		Article No.
Pressure transmitter for absolute pressure from differential pressure series		
SITRANS P DS III with PROFIBUS PA (PA)		7MF4334-
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7MF4335-
Click on the Article No. for the online configuration in the PLM Life Cycle Portal.		
Measuring cell filling	Measuring cell cleaning	
Silicone oil	normal	1
Inert liquid ¹⁾	grease-free to cleanliness level 2	3
Nominal measuring range		
250 mbar a	(3.63 psi a)	D
1300 mbar a	(18.86 psi a)	F
5 bar a	(72.5 psi a)	G
30 bar a	(435 psi a)	H
100 bar a	(1450 psi a)	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/DIN EN 61518 - Mounting thread M10 to DIN 19213 (only for replacement requirement) - Vent on side of process flange⁷⁾ - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 - Mounting thread M10 to DIN 19213 (only for replacement requirement)		2 0 6 4
Non-wetted parts materials		
process flange screws	Electronics enclosure	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting	3
Version		
- Standard version, German plate inscription, setting for pressure unit: bar - International version, English plate inscription, setting for pressure unit: bar - Chinese version, English plate inscription, setting for pressure unit: Pascal All versions include DVD with compact operating instructions in various EU languages.		1 2 3
Explosion protection		
- None - With ATEX, Type of protection: "Intrinsic safety (Ex ia)" "Explosion-proof (Ex d)"⁸⁾ "Intrinsic safety and flameproof enclosure (Ex ia + Ex d)"⁹⁾ "Ex nA/ic (Zone 2)"¹⁰⁾ "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"^{9) 11)} - FM + CSA intrinsic safe (is)¹²⁾ - FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D^{9) 11) 12)} - With FM + CSA, Type of protection: "Intrinsic Safe and Explosion Proof (is + xp)"^{8) 12)}		A B D P E R F S NC

Selection and Ordering data		Article No.
Pressure transmitter for absolute pressure from differential pressure series		
SITRANS P DS III with PROFIBUS PA (PA)		7MF4334-
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7MF4335-
Click on the Article No. for the online configuration in the PLM Life Cycle Portal.		
Electrical connection/cable entry		
- Screwed gland M20 x 1.5 - Screwed gland 1/2-14 NPT - Device plugs M12 (stainless steel)^{13) 14)}		B C F
Display		
- Without display - Without visible display (display concealed, setting: bar) - With visible display (setting: bar) - With customer-specific display (setting as specified, Order code "Y21" required)		0 1 6 7
Included in delivery of the device:		
- Quick-start guide - Sealing plug(s) or sealing screw(s) for the process flanges(s)		
¹⁾ For oxygen application, add Order code E10. ²⁾ Version 7MF4334-1DY... only up to max. measuring span 200 mbar a (80 inH ₂ O a). ³⁾ When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here. ⁴⁾ If the inspection 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... and 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 psi a). 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 device plugs Han and M12 are only available in Ex ic. ¹¹⁾ Only in connection with IP66. ¹²⁾ Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505. ¹³⁾ 11Only in connection with Ex approval A, B, E or F. ¹⁴⁾ M12 delivered without cable socket		

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 304	A02	✓	✓	✓
• Stainless steel 316L	A03	✓	✓	✓
O-rings for process flanges (instead of FPM (Viton))				
• PTFE (Teflon)	A20	✓	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	✓
• FFP (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	✓
• NBR (Buna N)	A23	✓	✓	✓
Device plugs¹⁾				
• Han 7D (metal)	A30	✓		
• Han 8D (instead of Han 7D)	A31	✓		
• Angled	A32	✓		
• Han 8D (metal)	A33	✓		
Sealing screw 1/4-18 NPT, with vent valve in mat. of process flanges	A40	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))	A50	✓	✓	✓
Rating plate inscription (instead of German)				
• English	B11	✓	✓	✓
• French	B12	✓	✓	✓
• Spanish	B13	✓	✓	✓
• Italian	B14	✓	✓	✓
• Cyrillic (russian)	B16	✓	✓	✓
English rating plate Pressure units in inH ₂ O and/or psi	B21	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)²⁾	C11	✓	✓	✓
Inspection certificate³⁾ Acc. to EN 10204-3.1	C12	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	C14	✓	✓	✓
Inspection certificate (EN 10204-3.1) PMI test of parts in contact with medium	C15	✓	✓	✓
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	C21⁴⁾		✓	
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓		
PED for Russia with initial calibration mark	C99	✓	✓	✓

Selection and Ordering data	Order code			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
Setting of the upper saturation limit of the 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 IP66/IP68 (only for M20 x 1.5 and 1/2-14 NPT)	D12	✓	✓	✓
Supplied with oval flange (1 item), PTFE packing and screws in thread of process flange	D37	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	D59	✓	✓	✓

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

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
Use in or on zone 1D/2D⁵⁾ (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-...-B.. Ex ia)" and IP66)		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 ⁶⁾	✓	✓	✓
Dual seal		E24	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-...-B..)		E25 ⁷⁾	✓	✓	✓
"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-...-D..)		E26 ⁷⁾	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-...-P..)		E28 ⁷⁾	✓	✓	
Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-...-B..)		E45 ⁷⁾	✓	✓	✓
Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-...-D..)		E46 ⁷⁾	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-...-B..)		E55 ⁷⁾	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-...-D..)		E56 ⁷⁾	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-...-E..)		E57 ⁷⁾	✓	✓	✓
Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China) (only for transmitter 7MF4...-...-R..)		E58 ⁷⁾	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-...-[B, D]..-Z + E11)		E70 ⁷⁾	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)		E80	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)		E81	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)		E82	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)		E83	✓	✓	✓
Two coats of lacquer on enclosure 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) ⁸⁾		H03	✓	✓	✓

Selection and Ordering data		Order code			
Further designs Add "-Z" to Article No. and specify Order code.			HART	PA	FF
Transient protector 6 kV (lightning protection)		J01	✓	✓	✓
Chambered graphite gasket for process flange		J02	✓	✓	✓
Chambered PTFE graphite gasket		J03	✓	✓	✓
EPDM O-rings for process flange with approval (WRC/WRAS)		J05	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)⁹⁾		J08	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)⁹⁾		J09	✓	✓	✓
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	✓	✓	✓
Marine approvals					
• Det Norske Veritas Germanischer Lloyd (DNV-GL)		S10	✓	✓	✓
• Lloyds Register (LR)		S11	✓	✓	✓
• French marine classification society Bureau Veritas (BV)		S12	✓	✓	✓
• American Bureau of Shipping (ABS)		S14	✓	✓	✓
• Russian Maritime Register (RMR)		S16	✓	✓	✓
• Korean Register of Shipping (KR)		S17	✓	✓	✓

1) Device plug Han IP65

2) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.

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

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

5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

6) Cannot be ordered with remote seal.

7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

8) Not suitable for connection of remote seals.

9) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

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 a, bar a, kPa _{abs} , MPa _{abs} , psi a ²⁾	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 units³⁾ 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) Only absolute pressure units selectable. Negative pressure values not permitted.

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

Pressure Measurement

Pressure transmitters

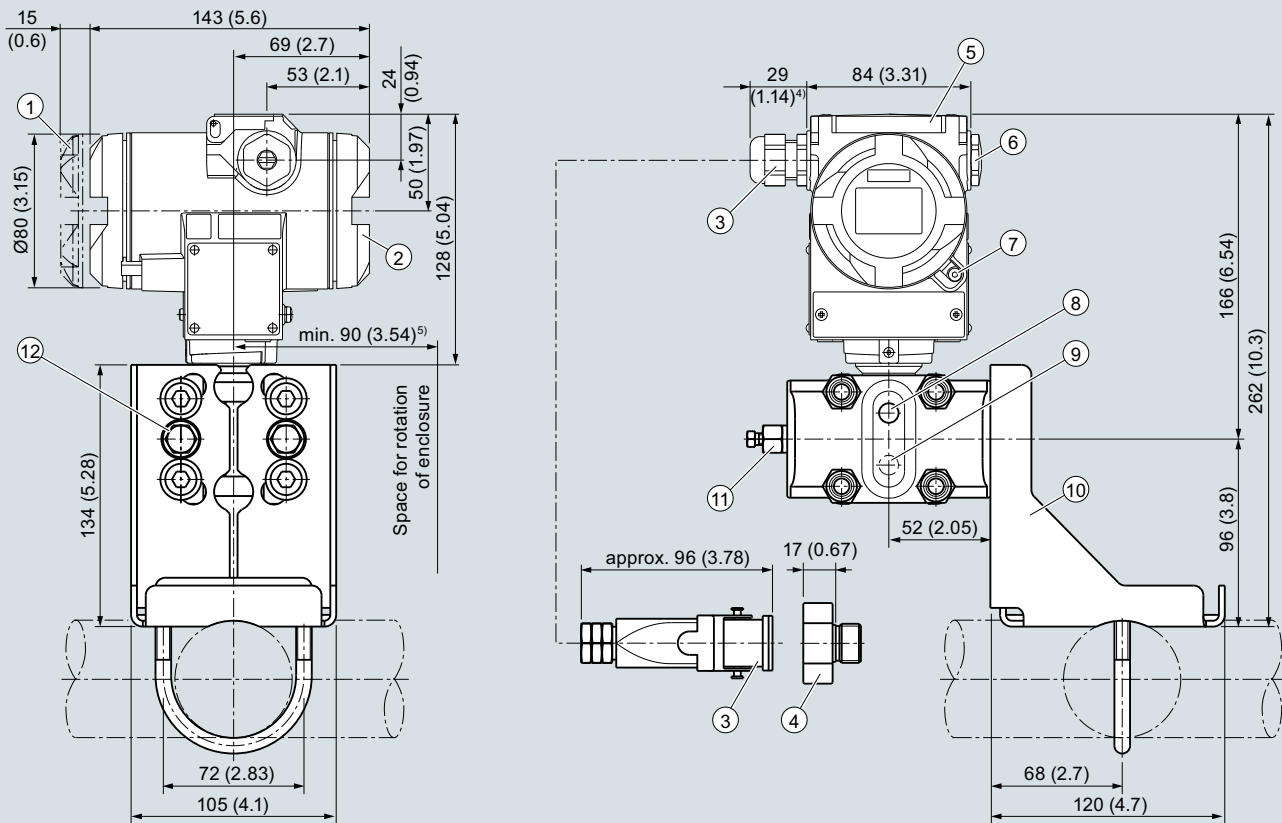
for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

1

Dimensional drawings



- ① Electronics side, local display
(longer overall length for cover with inspection window)¹⁾
- ② Connection side¹⁾
- ③ Electrical connection:
 • Pg 13.5 screw gland (adapter)^{2) 3)}
 • M20 x 1.5 screw gland
 • ½-14 NPT screw gland
 • Han 7D/Han 8D^{2) 3)} device plug
- ④ Harting adapter
- ⑤ Cover over buttons

- ⑥ Blanking plug
- ⑦ Safety catch (only for "flameproof enclosure" type of protection;
not shown in the drawing)
- ⑧ Lateral ventilation for liquid measurement (Standard)
- ⑨ Lateral ventilation for gas measurement (order option H02)
- ⑩ Mounting bracket (optional)
- ⑪ Sealing plug with valve (optional)
- ⑫ Process connection: ¼-18 NPT (IEC 61518)

- ¹⁾ In addition, allow approx. 20 mm (0.79 inch) for the thread length
- ²⁾ Not with "flameproof enclosure" type of protection
- ³⁾ Not for type of protection "FM + CSA" [is + XP]"
- ⁴⁾ For Pg 13.5 with adapter, approx. 45 mm (1.77 inch)
- ⁵⁾ 92 mm (3.62 inch) minimum distance for rotating with indicator

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

Technical specifications**SITRANS P, DS III for differential pressure and flow****Input**

Measured variable

Measuring span (infinitely adjustable) or nominal measuring range and maximum operating pressure (pursuant to 2014/68/EU Pressure Equipment Directive)

Differential pressure and flow

HART	PROFIBUS PA/ FOUNDATION Fieldbus	
Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)
1 ... 20 mbar 0.1 ... 2 kPa 0.4 ... 8 inH ₂ O	20 mbar 2 kPa 8 inH ₂ O	32 bar 3.2 MPa 464 psi
1 ... 60 mbar 0.1 ... 6 kPa 0.4 ... 24 inH ₂ O	60 mbar 6 kPa 24.1 inH ₂ O	160 bar 16 MPa 2320 psi
2.5 ... 250 mbar 0.2 ... 25 kPa 1 ... 100 inH ₂ O	250 mbar 25 kPa 100 inH ₂ O	
6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH ₂ O	600 mbar 60 kPa 240 inH ₂ O	
16 ... 1600 mbar 1.6 ... 160 kPa 6.4 ... 642 inH ₂ O	1600 mbar 160 kPa 642 inH ₂ O	
50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH ₂ O	5000 mbar 500 kPa 2000 inH ₂ O	
0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi	
2.5 ... 250 mbar 0.2 ... 25 kPa 1 ... 100 inH ₂ O	250 mbar 25 kPa 100 inH ₂ O	420 bar 42 MPa 6091 psi
6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH ₂ O	600 mbar 60 kPa 240 inH ₂ O	(500 bar/50 MPa/7250 psi can be ordered optionally with Order Code D56)
16 ... 1600 mbar 1.6 ... 160 kPa 6.4 ... 642 inH ₂ O	1600 mbar 160 kPa 642 inH ₂ O	
50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH ₂ O	5000 mbar 500 kPa 2000 inH ₂ O	
0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi	

Lower measuring limit

- Measuring cell with silicone oil filling

-100 % of max. measuring span (-33 % with measuring cell 30 bar/3 MPa/435 psi)
or 30 mbar a/3 kPa a/0.44 psi a

- Measuring cell with inert filling liquid

- for temperature of medium -20 °C < ϑ ≤ +60 °C
(-4 °F < ϑ ≤ +140 °F)

-100 % of max. measuring span (-33 % with measuring cell 30 bar/3 MPa/435 psi)
or 30 mbar a/3 kPa a/0.44 psi a

- for temperature of medium
60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar)
(140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell
435 psi))

30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C
3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C
0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F

Upper measuring limit

100 % of max. measuring span
(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F)
ambient temperature/temperature of medium)

Lower range value

Between the measuring limits (fully adjustable)

Pressure Measurement

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Output	HART	PROFIBUS PA/FOUNDATION Fieldbus
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
- Lower limit (infinitely adjustable) - Upper limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA 23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA (with order code D05)	-
Load		
- Without HART - With HART	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$ U_H : Power supply in V $R_B = 230 \dots 500 \Omega$ (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 - Lower range value 0 bar/kPa/psi - Stainless steel seal diaphragm - Silicone oil filling - Room temperature 25 °C (77 °F)	
Measuring span ratio r (spread, Turn-Down)	$r = \text{max. measuring span/set measuring span or nominal measuring range}$	
Error in measurement at limit setting incl. hysteresis and reproducibility		
Linear characteristic		
- 20 mbar/2 kPa/0.29 psi	$r \leq 5 :$ $5 < r \leq 10 :$ $10 < r \leq 20 :$	$\leq 0.075 \%$ $\leq (0.0029 \cdot r + 0.071) \%$ $\leq (0.0045 \cdot r + 0.071) \%$
- 60 mbar/6 kPa/0.87 psi	$r \leq 5 :$ $5 < r \leq 60 :$	$\leq 0.075 \%$ $\leq (0.005 \cdot r + 0.05) \%$
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5 :$ $5 < r \leq 100 :$	$\leq 0.065 \%$ $\leq (0.004 \cdot r + 0.045) \%$
Square-rooted characteristic (flow > 50 %)		
- 20 mbar/2 kPa/0.29 psi	$r \leq 5 :$ $5 < r \leq 10 :$ $10 < r \leq 20 :$	$\leq 0.075 \%$ $\leq (0.0029 \cdot r + 0.071) \%$ $\leq (0.0045 \cdot r + 0.071) \%$
- 60 mbar/6 kPa/0.87 psi	$r \leq 5 :$ $5 < r \leq 60 :$	$\leq 0.075 \%$ $\leq (0.005 \cdot r + 0.05) \%$
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5 :$ $5 < r \leq 100 :$	$\leq 0.065 \%$ $\leq (0.004 \cdot r + 0.045) \%$
Square-rooted characteristic (flow > 25 ... 50 %)		
- 20 mbar/2 kPa/0.29 psi	$r \leq 5 :$ $5 < r \leq 10 :$ $10 < r \leq 20 :$	$\leq 0.15 \%$ $\leq (0.0058 \cdot r + 0.142) \%$ $\leq (0.009 \cdot r + 0.142) \%$
- 60 mbar/6 kPa/0.87 psi	$r \leq 5 :$ $5 < r \leq 60 :$	$\leq 0.015 \%$ $\leq (0.01 \cdot r + 0.1) \%$
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5 :$ $5 < r \leq 100 :$	$\leq 0.13 \%$ $\leq (0.008 \cdot r + 0.09) \%$

SITRANS P, DS III for differential pressure and flow**Measuring accuracy** (continued)

Acc. IEC 60770-1

Influence of ambient temperature
(in percent per 28 °C (50 °F))

- 20 mbar/2 kPa/0.29 psi $\leq (0.15 \cdot r + 0.1) \%$
- 60 mbar/6 kPa/0.87 psi $\leq (0.075 \cdot r + 0.1) \%$
- 250 mbar/25 kPa/3.63 psi $\leq (0.025 \cdot r + 0.125) \%$
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi
- 30 bar/3 MPa/435 psi

Influence of static pressure

- on the lower range value
 - 20 mbar/2 kPa/0.29 psi $\leq (0.15 \cdot r) \%$ per 32 bar
(zero offset is possible with position error adjustment)
 - 60 mbar/6 kPa/0.87 psi $\leq (0.1 \cdot r) \%$ per 70 bar
(zero offset is possible with position error adjustment)
 - 250 mbar/25 kPa/3.63 psi
 - 600 mbar/60 kPa/8.7 psi
 - 1600 mbar/160 kPa/23.21 psi
 - 5 bar/500 kPa/72.5 psi $\leq (0.2 \cdot r) \%$ per 70 bar
(zero offset is possible with position error adjustment)
 - 30 bar/3 MPa/435 psi
- on the measuring span
 - 20 mbar/2 kPa/0.29 psi $\leq 0.2 \%$ per 32 bar
 - 60 mbar/6 kPa/0.87 psi $\leq 0.14 \%$ per 70 bar
 - 250 mbar/25 kPa/3.63 psi
 - 600 mbar/60 kPa/8.7 psi
 - 1600 mbar/160 kPa/23.21 psi
 - 5 bar/500 kPa/72.5 psi
 - 30 bar/3 MPa/435 psi

Long-term stability
(temperature change ± 30 °C (± 54 °F))

Static pressure max. 70 bar/7 MPa/ 1015 psi

- 20 mbar/2 kPa/0.29 psi $\leq (0.2 \cdot r) \%$ per year
- 60 mbar/6 kPa/0.87 psi $\leq (0.25 \cdot r) \%$ in 5 years
- 30 bar/3 MPa/435 psi
- 250 mbar/25 kPa/3.63 psi $\leq (0.125 \cdot r) \%$ in 5 years
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi

Effect of mounting position (in pressure per change in angle)

 ≤ 0.7 mbar/0.07 kPa/0.028 inH₂O per 10° inclination
(zero offset is possible with position error adjustment)Effect of auxiliary power supply
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and
FOUNDATION Fieldbus $3 \cdot 10^{-5}$ of nominal measuring range

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SITRANS P, DS III for differential pressure and flow

Operating conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

Temperature of medium

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
- Measuring cell with Neobee fill fluid (FDA-compliant)
- In conjunction with dust explosion protection

Ambient conditions

- Ambient temperature (silicone oil and inert oil)
 - Transmitter

- Display readable

- Ambient temperature (Neobee fill fluid)

- Transmitter

- Storage temperature

- Climatic class

- Condensation

- Electromagnetic Compatibility

- Emitted interference and interference immunity

IP66 (optional IP66/IP68)

Type 4X

-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F)
with 30 bar measuring cell

-20 ... +100 °C (-4 ... +212 °F)

-10 ... +100 °C (+14 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F)

-40 ... +85 °C (-40 ... +185 °F)

-20 ... +85 °C (-4 ... +185 °F) with 30 bar measuring cell

-30 ... +85 °C (-22 ... +185 °F)

-10 ... +85 °C (+14 ... +185 °F)

-50 ... +85 °C (-58 ... +185 °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)

Die-cast aluminum: ≈ 4.5 kg (≈ 9.9 lb)
Stainless steel precision casting: ≈ 7.1 kg (≈ 15.6 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. 2.4602 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

Female thread 1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to IEC 61518/DIN EN 61518

Material of mounting bracket

- Steel
- Stainless steel 304
- Stainless steel 316L

Sheet-steel, Mat. No. 1.0330, chrome-plated

Sheet stainless steel, mat. no. 1.4301 (SS 304)

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

Power supply U_H

Terminal voltage on transmitter

HART
10.5 ... 45 V DC
10.5 ... 30 V DC in intrinsically-safe mode

PROFIBUS PA/ FOUNDATION Fieldbus

-

Power supply

-

Supplied through bus

Separate supply voltage

-

No

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

Pressure Measurement

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SITRANS P, DS III for differential pressure and flow**Certificates and approvals**

Classification according to PED 2014/68/EU

Explosion protection

• Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

• Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

• Dust explosion protection for zone 20

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

• Dust explosion protection for zone 21/22

- Marking
- Connection

• Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

• Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

• Explosion protection to CSA

- Identification (XP/DIP) or (IS)

HART

- PN 32/160 (MAWP 464/2320 psi) for gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
- PN 420 (MAWP 6092) for gases of fluid group 1 and liquids of fluid group 1; complies with basic safety requirements of Article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord.

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-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

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$;
 $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$;
 $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

 $U_m = 45 \text{ V}$

To circuits with values:
 $U_i = 45 \text{ V}$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

Certificate of Compliance 3008490

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

Certificate of Compliance 1153651

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

PROFIBUS PA/ FOUNDATION Fieldbus

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values:
 $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$;
 $P_{\max} = 1 \text{ W}$

 $U_m = 32 \text{ V}$

FISCO supply unit ic:
 $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$

Linear barrier:
 $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

Pressure Measurement

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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 PC	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	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
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		
- 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		

Pressure Measurement

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SITRANS P DS III

for differential pressure and flow

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Selection and Ordering data		Article No.	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)		7 MF 4 4 3 3 -	SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi)		7 MF 4 4 3 3 -
➔ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			Explosion protection		
Measuring cell filling			• None		A
Measuring cell cleaning			• With ATEX, Type of protection:		B
Silicone oil	normal	1	- "Intrinsic safety (Ex ia)"		D
Inert liquid ¹⁾	grease-free to cleanliness level 2	3	- "Explosion-proof (Ex d)* ¹⁰⁾		P
FDA compliant fill fluid ²⁾			- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)* ¹¹⁾		E
• Neobee oil	normal	4	- "Ex nA/ic (Zone 2)* ¹²⁾		R
Measuring span (min. ... max.)			- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)* ¹¹⁾¹³⁾		F
PN 32 (MAWP 464 psi)			• FM + CSA intrinsic safe (is)* ¹⁴⁾		S
1 ... 20 mbar ³⁾	(0.4 ... 8 inH ₂ O)	B	• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D ¹¹⁾¹³⁾¹⁴⁾		NC
PN 160 (MAWP 2320 psi)			• With FM + CSA, Type of protection:		
1 ... 60 mbar	(0.4 ... 24 inH ₂ O)	C	- "Intrinsic Safe and Explosion Proof (is + xp)* ¹⁰⁾¹⁴⁾		
2.5 ... 250 mbar	(1.004 ... 100.4 inH ₂ O)	D	Electrical connection/cable entry		B
6 ... 600 mbar	(2.4 ... 240 inH ₂ O)	E	• Screwed gland M20 x 1.5		C
16 ... 1600 mbar	(6.4 ... 642 inH ₂ O)	F	• Screwed gland ½-14 NPT		D
50 ... 5000 mbar	(20 ... 2000 inH ₂ O)	G	• Device plug Han 7D (plastic enclosure) incl. mating connector ¹⁵⁾¹⁶⁾		F
0.3 ... 30 bar	(4.35 ... 435 psi)	H	• Device plugs M12 (stainless steel) ¹⁷⁾¹⁸⁾		
Wetted parts materials			Display		
(stainless steel process flanges)			• Without display		0
Seal diaphragm	Parts of measuring cell		• Without visible display (display concealed, setting: mA)		1
Stainless steel	Stainless steel	A	• With visible display (setting: mA)		6
Hastelloy	Stainless steel	B	• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)		7
Hastelloy	Hastelloy	C	Power supply units see Chap. 7 "Supplementary Components".		
Tantalum ⁴⁾	Tantalum	E	Included in delivery of the device:		
Monel ⁴⁾	Monel	H	• Quick-start guide		
Gold ⁴⁾	Gold	L	• Sealing plug(s) or sealing screw(s) for the process flanges(s)		
Version for diaphragm seal ^{5) 6) 7) 8)}		Y	1) For oxygen application, add Order code E10.		
Process connection			2) Available for measuring ranges 250 mbar ... 5 bar.		
Female thread ¼-18 NPT with flange connection			3) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).		
• Sealing screw opposite process connection			4) Not in conjunction with max. measuring span 20 and 60 mbar (8.03 and 24.09 inH ₂ O))		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		2	5) When also ordering the quality test certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.		
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		0	6) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
• Vent on side of process flange ³⁾			7) 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... and 7MF4900-1...-B		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		6	8) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.		
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		4	9) Not in conjunction with Electrical connection "device plug Han 7D".		
Non-wetted parts materials			10) Without cable gland, with blanking plug		
process flange screws Electronics enclosure			11) With enclosed cable gland Ex ia and blanking plug		
Stainless steel	Die-cast aluminum	2	12) Configurations with device plugs Han and M12 are only available in Ex ic.		
Stainless steel	Stainless steel precision casting ⁹⁾	3	13) Only in connection with IP66.		
Version			14) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
• Standard version, German plate inscription, setting for pressure unit: bar		1	15) Only in connection with Ex approval A, B or E.		
• International version, English plate inscription, setting for pressure unit: bar		2	16) Permissible only for crimp-contact of conductor cross-section 1 mm ²		
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3	17) Only in connection with Ex approval A, B, E or F.		
All versions include DVD with compact operating instructions in various EU languages.			18) M12 delivered without cable socket.		

Pressure Measurement

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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 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	Measuring cell cleaning	
Silicone oil	normal	1
Inert liquid ¹⁾	grease-free to cleanliness level 2	3
FDA compliant fill fluid ²⁾		
• Neobee oil	normal	4
Nominal measuring range		
PN 32 (MAWP 464 psi)		
20 mbar ³⁾	(8.03 inH ₂ O)	B
PN 160 (MAWP 2320 psi)		
60 mbar	(24 inH ₂ O)	C
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
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 ⁴⁾	Tantalum	E
Monel ⁴⁾	Monel	H
Gold ⁴⁾	Gold	L
Version as diaphragm seal ^{5) 6) 7) 8)}		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/DIN EN 61518		2
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		0
• Venting on side of process flanges ³⁾		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		6
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		4
Non-wetted parts materials		
process flange screws	Electronics enclosure	
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 DVD (no Order code selectable)		2
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		

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 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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⁾¹²⁾		R
• FM + CSA intrinsic safe (is)" ¹³⁾		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX)+ Zone 1D/2D" ¹⁰⁾¹²⁾¹³⁾		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)" ⁹⁾¹³⁾		NC
Electrical connection/cable entry		
• Screwed gland M20 x 1.5		B
• Screwed gland 1/2-14 NPT		C
• Device plugs M12 (stainless steel) ^{14) 15)}		F
Display		
• Without display		0
• Without visible display (display concealed, setting: bar)		1
• With visible display (setting: bar)		6
• With customer-specific display (setting as specified, Order code "Y21" required)		7
Included in delivery of the device:		
• Quick-start guide		
• Sealing plug(s) or sealing screw(s) for the process flanges(s)		
1) For oxygen application, add Order code E10.		
2) Available for measuring ranges 250 mbar ... 5 bar.		
3) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).		
4) Not in conjunction with max. measuring span 20 and 60 mbar (8.03 and 24.09 inH ₂ O))		
5) 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.		
6) If the inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
7) 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... and 7MF4900-1...-B		
8) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.		
9) Without cable gland, with blanking plug.		
10) With enclosed cable gland Ex ia and blanking plug.		
11) Configurations with device plugs Han and M12 are only available in Ex ic.		
12) Only in connection with IP66.		
13) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
14) Only in connection with Ex approval A, B, E or F.		
15) M12 delivered without cable socket		

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 304	A02	✓	✓	✓
• Stainless steel 316L	A03	✓	✓	✓
O-rings for process flanges (instead of FPM (Viton))				
• PTFE (Teflon)	A20	✓	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	✓
• FFP (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	✓
• NBR (Buna N)	A23	✓	✓	✓
Device plugs¹⁾				
• Han 7D (metal)	A30	✓		
• Han 8D (instead of Han 7D)	A31	✓		
• Angled	A32	✓		
• Han 8D (metal)	A33	✓		
Sealing screws (2 units) ¼-18 NPT, with vent valve in mat. of process flanges	A40	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))	A50	✓	✓	✓
Rating plate inscription (instead of German)				
• English	B11	✓	✓	✓
• French	B12	✓	✓	✓
• Spanish	B13	✓	✓	✓
• Italian	B14	✓	✓	✓
• Cyrillic (russian)	B16	✓	✓	✓
English rating plate Pressure units in inH ₂ O and/or psi	B21	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)²⁾	C11	✓	✓	✓
Inspection certificate³⁾ to EN 10204-3.1	C12	✓	✓	✓
Factory certificate to EN 10204-2.2	C14	✓	✓	✓
Inspection certificate (EN 10204-3.1) PMI test of parts in contact with medium	C15	✓	✓	✓
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 ⁴⁾		✓	
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓		
PED for Russia with initial calibration mark	C99	✓	✓	✓

Selection and Ordering data	Order code			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
Setting of the upper saturation limit of the 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 IP66/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	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	D59	✓	✓	✓
Use in or on zone 1D/2D⁵⁾ (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia)" and IP66)	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	✓		
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 ⁶⁾	✓	✓	✓
Dual seal	E24	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..)	E25 ⁷⁾	✓	✓	✓
"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..)	E26 ⁷⁾	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..)	E28 ⁷⁾	✓	✓	
Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..)	E45 ⁷⁾	✓	✓	✓
Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-D..)	E46 ⁷⁾	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)	E55 ⁷⁾	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)	E56 ⁷⁾	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)	E57 ⁷⁾	✓	✓	✓
Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China) (only for transmitter 7MF4...-.....-R..)	E58 ⁷⁾	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 ⁷⁾	✓	✓	✓

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "-Z" to Article No. and specify Order code.				
Ex-protection Ex ia according to EAC Ex (Russia)	E80	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)	E81	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	E82	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	E83	✓	✓	✓
Two coats of lacquer on enclosure 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 ⁸)	H03	✓	✓	✓
Transient protector 6 kV (lightning protection)	J01	✓	✓	✓
Chambered graphite gasket for process flange	J02	✓	✓	✓
Chambered PTFE graphite gasket	J03	✓	✓	✓
EPDM O-rings for process flange with approval (WRC/WRAS)	J05	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)⁹	J08	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)⁹	J09	✓	✓	✓
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 1/2-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible	K04	✓	✓	✓
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓	✓
• Lloyds Register (LR)	S11	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	S12	✓	✓	✓
• American Bureau of Shipping (ABS)	S14	✓	✓	✓
• Russian Maritime Register (RMR)	S16	✓	✓	✓
• Korean Register of Shipping (KR)	S17	✓	✓	✓

Factory mounting of valve manifolds, see accessories.

✓ = available

¹) Device plug Han IP65

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 inspection certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

⁴) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

⁵) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

⁶) Cannot be ordered with remote seal.

⁷) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

⁸) Not suitable for connection of remote seal.

⁹) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

Selection and Ordering data	Order code	HART	PA	FF
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 • in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	Y01 Y02	✓ ✓	✓ 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 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	✓	✓	✓

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.

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

Selection and Ordering data		Article No.	
SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)		7 MF 4 5 3 3 -	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring cell filling	Measuring cell cleaning		
Silicone oil	normal	1	
Inert liquid ¹⁾	grease-free to cleanliness level 2	3	
Measuring span (min. ... max.)			
2.5 ... 250 mbar	(1.004 ... 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	
Gold ²⁾	Gold	L	
Version for diaphragm seal ^{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/DIN EN 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/DIN EN 61518		7	
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		5	
Non-wetted parts materials			
process flange screws	Electronics enclosure		
Stainless steel	Die-cast aluminum	2	
Stainless steel	Stainless steel precision casting ⁷⁾	3	
Version			
• Standard version, German plate inscription, setting for pressure unit: bar)		1	
• International version, English plate inscription, setting for pressure unit: bar		2	
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3	
All versions include DVD with compact operating instructions in various EU languages.			
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⁾¹¹⁾		R	
• FM + CSA intrinsic safe (is)" ¹²⁾		F	
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D ⁹⁾¹¹⁾¹²⁾		S	
• With FM + CSA, Type of protection:			
- "Intrinsic safety and explosion-proof (is + xp)" ⁸⁾¹²⁾ , max PN 360		NC	

Selection and Ordering data		Article No.	
SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)		7 MF 4 5 3 3 -	
Electrical connection/cable entry			
• Screwed gland M20x1.5			B
• Screwed gland 1/2-14 NPT			C
• Device plug Han 7D (plastic enclosure) incl. mating connector ¹³⁾¹⁴⁾			D
• Device plugs M12 (stainless steel) ^{15) 16)}			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".			
Scope of delivery: Pressure transmitter as ordered (Instruction Manual is extra ordering item)			
1) For oxygen application, add Order code E10.			
2) Not in conjunction with max. measuring span 600 mbar (240.9 inH ₂ O)			
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 total combination is certified here.			
4) If the inspection 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 wiht the transmitter order number, for example 7MF453-.-Y.-.-.-. and 7MF4900-1....-B			
6) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.			
7) Not in conjunction with Electrical connection "device plug Han 7D".			
8) Without cable gland, with blanking plug			
9) With enclosed cable gland Ex ia and blanking plug			
10) Configurations with device plugs Han and M12 are only available in Ex ic.			
11) Only in connection with IP66.			
12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.			
13) Only in connection with Ex approval A, B or E.			
14) Permissible only for crimp-contact of conductor cross-section 1 mm ²			
15) Only in connection with Ex approval A, B, E or F.			
16) M12 delivered without cable socket.			

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

Selection and Ordering data		Article No.
Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)		
SITRANS P DS III with PROFIBUS PA (PA)		7 M F 4 5 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 M F 4 5 3 5 -
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		■ ■ ■ ■ ■ - ■ ■ ■ ■ ■
Measuring cell filling	Measuring cell cleaning	
Silicone oil	normal	1
Inert liquid ¹⁾	grease-free to cleanliness level 2	3
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
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
Gold ²⁾	Gold	L
Version for diaphragm seal ^{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/DIN EN 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/DIN EN 61518		7
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		5
Non-wetted parts materials		
Process flange screws	Electronics enclosure	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting	3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		

Selection and Ordering data		Article No.
Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)		
SITRANS P DS III with PROFIBUS PA (PA)		7 M F 4 5 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 M F 4 5 3 5 -
■ ■ ■ ■ ■ - ■ ■ ■ ■ ■		
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) 10)} "		R
• FM + CSA intrinsic safe (is) ¹¹⁾		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX)+ Zone 1D/2D ^{9) 10) 11)}		S
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)* ^{7) 11)} , max PN 360		NC
Electrical connection/cable entry		
• Screwed gland M20 x 1.5		B
• Screwed gland 1/2-14 NPT		C
• Device plugs M12 (stainless steel) ^{12) 13)}		F
Display		
• Without (display hidden)		0
• Without visible display (display concealed, setting: bar)		1
• With visible display (setting: bar)		6
• With customer-specific display (setting as specified, Order code "Y21" required)		7
Included in delivery of the device:		
• Quick-start guide		
• Sealing plug(s) or sealing screw(s) for the process flanges(s)		
1) For oxygen application, add Order code E10.		
2) Not in conjunction with max. measuring span 600 mbar (240.9 inH ₂ O)		
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 inspection 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 7MF453-.-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 device plugs Han and M12 are only available in Ex ic.		
10) Only in connection with IP66.		
11) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
12) Only in connection with Ex approval A, B, E or F.		
13) M12 delivered without cable socket		

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 304	A02	✓	✓	✓	
• Stainless steel 316L	A03	✓	✓	✓	
O-rings for process flanges (instead of FPM (Viton))					
• PTFE (Teflon)	A20	✓	✓	✓	
• FEP (with silicone core, approved for food)	A21	✓	✓	✓	
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	✓	
• NBR (Buna N)	A23	✓	✓	✓	
Device plugs¹⁾					
• Han 7D (metal)	A30	✓			
• Han 8D (instead of Han 7D)	A31	✓			
• Angled	A32	✓			
• Han 8D (metal)	A33	✓			
Sealing screws (2 units) 1/4-18 NPT, with valve in mat. of process flanges		A40	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))		A50	✓	✓	✓
Rating plate inscription (instead of German)					
• English	B11	✓	✓	✓	
• French	B12	✓	✓	✓	
• Spanish	B13	✓	✓	✓	
• Italian	B14	✓	✓	✓	
• Cyrillic (russian)	B16	✓	✓	✓	
English rating plate Pressure units in inH ₂ O and/or psi		B21	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)		C11	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1		C12	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2		C14	✓	✓	✓
Inspection certificate (EN 10204-3.1) PMI test of parts in contact with medium		C15	✓	✓	✓
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 ²⁾		✓	
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration		C23	✓		
PED for Russia with initial calibration mark		C99	✓	✓	✓
Setting of the upper saturation limit of the 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 IP66/IP68 (only for M20 x 1.5 and 1/2-14 NPT)		D12	✓	✓	✓
Nominal pressure rating PN 500 (MAWP 7250 psi) (Only for measuring cell 600 mbar ... 30 bar (240 inH ₂ O ... 435 psi), SIL- and Ex-options not possible) ³⁾		D56	✓		
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included		D59	✓	✓	✓
Use in or on zone 1D/2D⁴⁾ (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia)" and IP66)		E01	✓	✓	✓
Export approval Korea		E11	✓	✓	✓
CRN approval Canada (Canadian Registration Number)		E22 ⁵⁾	✓	✓	✓
Dual seal		E24	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..)		E25 ⁶⁾	✓	✓	✓
"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..)		E26 ⁶⁾	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..)		E28 ⁶⁾	✓	✓	
Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..)		E45 ⁶⁾	✓	✓	✓
Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-D..)		E46 ⁶⁾	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)		E55 ⁶⁾	✓	✓	✓
Ex prot. "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)		E56 ⁶⁾	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)		E57 ⁶⁾	✓	✓	✓
Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China) (only for transmitter 7MF4...-.....-R..)		E58 ⁶⁾	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)		E70 ⁶⁾	✓	✓	✓
Ex-protection Ex ia acc. to EAC Ex (Russia)		E80	✓	✓	✓
Ex-protection Ex d acc. to EAC Ex (Russia)		E81	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)		E82	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)		E83	✓	✓	✓

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

Selection and Ordering data	Order code			
Further designs		HART	PA	FF
Add "-Z" to Article No. and specify Order code.				
Two coats of lacquer on enclosure 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	✓	✓	✓
Chambered graphite gasket for process flange	J02	✓	✓	✓
EPDM O-rings for process flange with approval (WRC/WRAS)	J05	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)⁷⁾	J08	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)⁷⁾	J09	✓	✓	✓
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓	✓
• Lloyds Register (LR)	S11	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	S12	✓	✓	✓
• American Bureau of Shipping (ABS)	S14	✓	✓	✓
• Russian Maritime Register (RMR)	S16	✓	✓	✓
• Korean Register of Shipping (KR)	S17	✓	✓	✓

¹⁾ Device plug Han IP65

²⁾ Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

³⁾ Tested according to IEC 61010. Only for media of the group of fluids 2 in accordance with PED permissible. Not for use with dangerous media suitable.

⁴⁾ Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

⁵⁾ Cannot be ordered with remote seal.

⁶⁾ When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

⁷⁾ Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

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)	Y15	✓	✓	✓
Max. 16 characters, specify in plain text: Y15:				
Measuring point text (entry in device variable)	Y16	✓	✓	✓
Max. 27 char., specify in plain text: Y16:				
Entry of HART address (TAG)	Y17	✓		
Max. 8 char., specify in plain text: Y17:				
Setting of pressure indication in pressure units	Y21	✓	✓	✓
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 ³⁾ , inH ₂ O ³⁾ , ftH ₂ O ³⁾ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or %) ref. temperature 20 °C				
Setting of pressure indication in non-pressure units²⁾	Y22 + Y01 or Y02	✓		
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)				
Preset bus address	Y25		✓	✓
possible between 1 and 126 Specify in plain text: Y25:				
Damping adjustment in seconds (0 ... 100 s)	Y30	✓	✓	✓

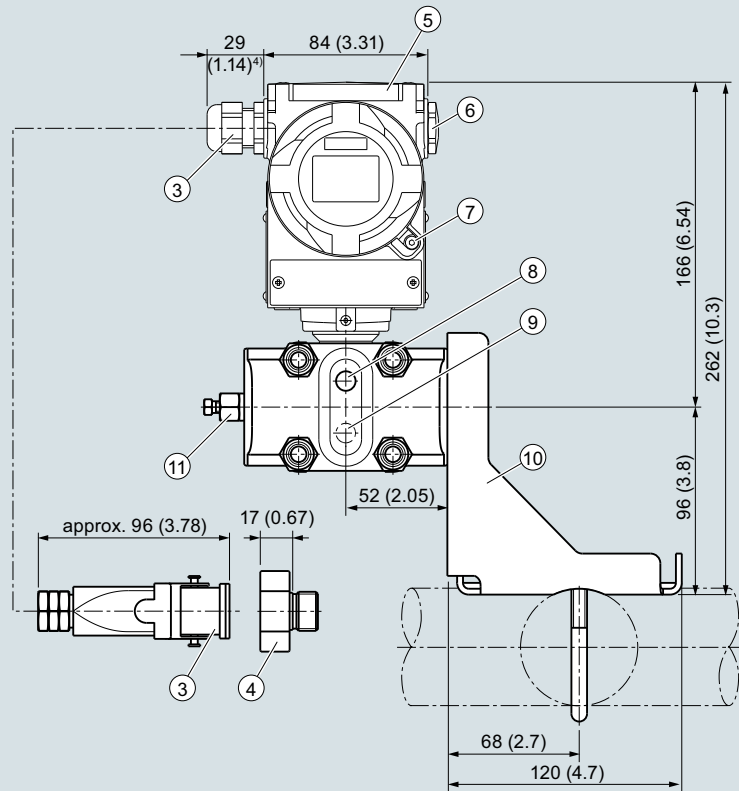
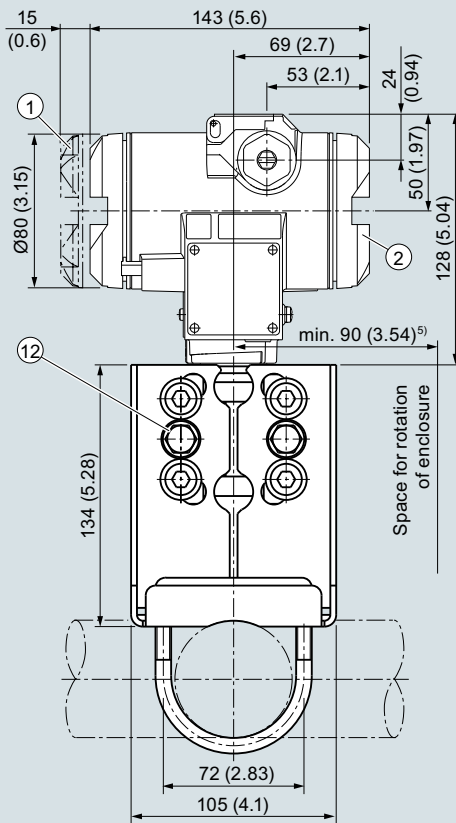
Factory mounting of valve manifolds, see accessories.

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.

Dimensional drawings

- ① Electronics side, local display (longer overall length for cover with inspection window)¹⁾
- ② Connection side¹⁾
- ③ Electrical connection:
 - Pg 13.5 screw gland (adapter)^{2) 3)}
 - M20 x 1.5 screw gland
 - ½-14 NPT screw gland
 - Han 7D/Han 8D^{2) 3)} device plug
- ④ Harting adapter
- ⑤ Cover over buttons

- ⑥ Blanking plug
- ⑦ Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
- ⑧ Lateral ventilation for liquid measurement (Standard)
- ⑨ Lateral ventilation for gas measurement (order option H02)
- ⑩ Mounting bracket (optional)
- ⑪ Sealing plug with valve (optional)
- ⑫ Process connection: ¼-18 NPT (IEC 61518)

- ¹⁾ In addition, allow approx. 20 mm (0.79 inch) for the thread length
- ²⁾ Not with "flameproof enclosure" type of protection
- ³⁾ Not for type of protection "FM + CSA" [is + XP]"
- ⁴⁾ For Pg 13.5 with adapter, approx. 45 mm (1.77 inch)
- ⁵⁾ 92 mm (3.62 inch) minimum distance for rotating with indicator

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

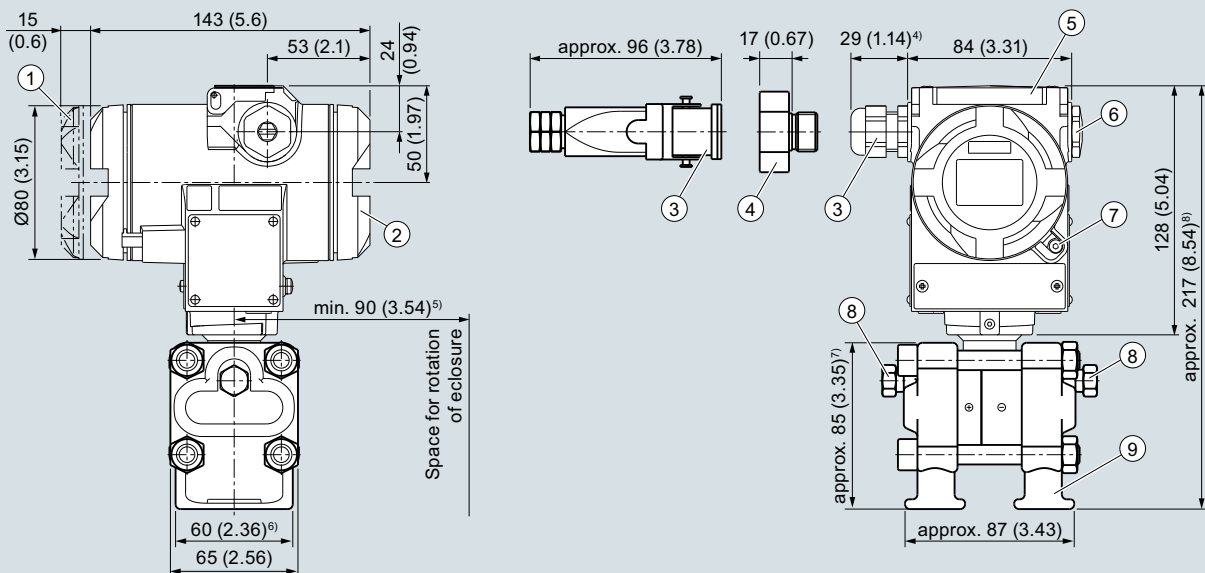
Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow



- ① Electronics side, local display (longer overall length for cover with inspection window)¹⁾
- ② Connection side¹⁾
- ③ Electrical connection:
 - Pg 13.5 screw gland (adapter)²⁾
 - M20 x 1.5 screw gland
 - 1/2-14 NPT screw gland
 - Han 7D/Han 8D²⁾ device plug
- ④ Harting adapter

- ⑤ Cover over buttons
- ⑥ Blanking plug
- ⑦ Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
- ⑧ Sealing plug with valve (optional)
- ⑨ Process connection: 1/4-18 NPT (IEC 61518)

- ¹⁾ In addition, allow approx. 20 mm (0.79 inch) for the thread length
- ²⁾ Not with "flameproof enclosure" type of protection
- ³⁾ Not for type of protection "FM + CSA" [is + XPI]
- ⁴⁾ For Pg 13.5 with adapter, approx. 45 mm (1.77 inch)
- ⁵⁾ 92 mm (3.62 inch) minimum distance for rotating with indicator
- ⁶⁾ 74 mm (2.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
- ⁷⁾ 91 mm (3.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
- ⁸⁾ 219 mm (8.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

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

Technical specifications

SITRANS P DS III for level

Input

Measured variable

Level

Measuring span (infinitely adjustable) or nominal measuring range and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)

HART

PROFIBUS PA/
FOUNDATION
Fieldbus

Measuring span

Nominal measuring range

Max. operating pressure MAWP (PS)

25 ... 250 mbar
2.5 ... 25 kPa
10 ... 100 inH₂O250 mbar
25 kPa
100 inH₂O

See "Mounting flange"

25 ... 600 mbar
2.5 ... 60 kPa
10 ... 240 inH₂O600 mbar
60 kPa
240 inH₂O53 ... 1600 mbar
5.3 ... 160 kPa
21 ... 640 inH₂O1600 mbar
160 kPa
642 inH₂O160 ... 5000 mbar
16 ... 500 kPa
2.32 ... 72.5 psi5000 mbar
500 kPa
72.5 psi

Lower measuring limit

- Measuring cell with silicone oil filling

-100 % of max. measuring span or 30 mbar a/3 kPa a/0.44 psi a depending on mounting flange

- Measuring cell with inert filling liquid

-100 % of max. measuring span or 30 mbar a/3 kPa a/0.44 psi a depending on mounting flange

Upper measuring limit

100 % of max. measuring span

Lower range value

Between the measuring limits (fully adjustable)

Output

HART

PROFIBUS PA/FOUNDATION Fieldbus

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

 $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$
 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)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

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SITRANS P DS III for level

Measuring accuracy

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Lower range value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nominal measuring range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

$r \leq 5 :$ $\leq 0.125 \%$
 $5 < r \leq 10 :$ $\leq (0.007 \cdot r + 0.09) \%$

- 600 mbar/60 kPa/8.7 psi

$r \leq 5 :$ $\leq 0.125 \%$
 $5 < r \leq 25 :$ $\leq (0.007 \cdot r + 0.09) \%$

- 1600 mbar/160 kPa/23.21 psi
 5 bar/500 kPa/72.5 psi

$r \leq 5 :$ $\leq 0.125 \%$
 $5 < r \leq 30 :$ $\leq (0.007 \cdot r + 0.09) \%$

Influence of ambient temperature (in percent per 28 °C (50 °F))

- 250 mbar/25 kPa/3.6 psi

$\leq (0.4 \cdot r + 0.16) \%$

- 600 mbar/60 kPa/8.7 psi

$\leq (0.24 \cdot r + 0.16) \%$

- 1600 mbar/160 kPa/23.21 psi
 5 bar/500 kPa/72.5 psi

$\leq (0.2 \cdot r + 0.16) \%$

Influence of static pressure

- on the lower range value

- 250 mbar/25 kPa/3.6 psi

$\leq (0.3 \cdot r) \%$ per nominal pressure

- 600 mbar/60 kPa/8.7 psi

$\leq (0.15 \cdot r) \%$ per nominal pressure

- 1600 mbar/160 kPa/23.21 psi
 5 bar/500 kPa/72.5 psi

$\leq (0.1 \cdot r) \%$ per nominal pressure

- on the measuring span

$\leq (0.1 \cdot r) \%$ per nominal pressure

Long-term stability (temperature change ± 30 °C (± 54 °F))

$\leq (0.25 \cdot r) \%$ in 5 years
 static pressure max. 70 bar/7 MPa/1015 psi

Effect of mounting position

Depending on filling liquid of mounting flange

Effect of auxiliary power supply (in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

$3 \cdot 10^{-5}$ of nominal measuring range

Operating conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling

- High-pressure side

-40 ... +100¹⁾ °C (-40 ... +212¹⁾ °F)

$p_{\text{abs}} \geq 1$ bar: -40 ... +175 °C (-40 ... +347 °F)

$p_{\text{abs}} < 1$ bar: -40 ... +80 °C (-40 ... +176 °F)

- Low-pressure side

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F) in conjunction with dust explosion protection

Ambient conditions

- Ambient temperature

- Transmitter

-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

SITRANS P DS III for level**Design**

Weight (without options)

- To EN (pressure transmitter with mounting flange, without tube)

≈ 11 ... 13 kg (≈ 24.2 ... 28.7 (lb))

- To ASME (pressure transmitter with mounting flange, without tube)

≈ 11 ... 18 kg (≈ 24.2 ... 39.7 (lb))

Enclosure material

Low-copper die-cast aluminum, GD-ALSi12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

High-pressure side

- Seal diaphragm of mounting flange

- Stainless steel, W.-Nr. 1.4404/316L
 - coated with PFA
 - coated with PTFE
 - coated with ECTFE
 - gold plated
- Monel 400, mat. no. 2.4360
- Hastelloy C276, mat. no. 2.4619
- Hastelloy C4, mat. no. 2.4602
- Hastelloy C22, mat. no. 2.4602
- Tantalum
- Titanium, mat. no. 3.7035
- Nickel 201
- Duplex 2205, mat. no. 1.4462

Measuring cell filling

Silicone oil

Process connection

- High-pressure side

- Low-pressure side

Flange to EN and ASME

Female thread 1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to IEC 61518/DIN EN 61518

Power supply U_H

Terminal voltage on transmitter

HART

10.5 ... 45 V DC

10.5 ... 30 V DC in intrinsically-safe mode

PROFIBUS PA/FOUNDATION Fieldbus

-

Power supply

Supplied through bus

Separate supply voltage

-

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

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

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SITRANS P DS III for level

Certificates and approvals

Classification according to PED 2014/68/EU

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

- Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

- Dust explosion protection for zone 20

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

- Dust explosion protection for zone 21/22

- Marking
- Connection

- Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

- Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

- Explosion protection to CSA

- Identification (XP/DIP) or (IS)

HART

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-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

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc

Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc

$U_m = 45 \text{ V}$

To circuits with values:
 $U_i = 45 \text{ V}$

$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

Certificate of Compliance 3008490

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

Certificate of Compliance 1153651

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

PROFIBUS PA/ FOUNDATION Fieldbus

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values:
 $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$
Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$

$U_m = 32 \text{ V}$

FISCO supply unit ic:
 $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$

Linear barrier:
 $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$

$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

¹⁾ This value may be increased if the process connection is sufficiently insulated.

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		
- 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	Mounting flange	
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)	Nominal diameter	Nominal pressure
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively	• Acc. to EN 1092-1	
		- DN 80	PN 40
• Physical block	1	- DN100	PN16, PN40
Transducer blocks	2	• To ASME B16.5	
• Pressure transducer block		- 3 inch	class 150, class 300
- Can be calibrated by applying two pressures	Yes	- 4 inch	class 150, class 300
- 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

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

1

Selection and Ordering data

Article No.

Pressure transmitter for level, SITRANS P DS III with HART

7MF4633 -

Y - - - -

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Measuring cell filling Measuring cell cleaning

Silicone oil normal

1

Measuring span (min. ... max.)

25 ... 250 mbar (10 ... 100 inH₂O)
25 ... 600 mbar (10 ... 240 inH₂O)
53 ... 1600 mbar (21 ... 642 inH₂O)
0.16 ... 5 bar (64.3 ... 2000 inH₂O)

D
E
F
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/DIN EN 61518
- Mounting thread M10 to DIN 19213 (only for replacement requirement)

2
0

Non-wetted parts materials

process flange screws Electronics enclosure

Stainless steel Die-cast aluminum
Stainless steel Stainless steel precision casting¹⁾

2
3

Version

- Standard version, German plate inscription, setting for pressure unit: bar
- International version, English plate inscription, setting for pressure unit: bar
- Chinese version, English plate inscription, setting for pressure unit: Pascal

1
2
3

All versions include DVD with compact operating instructions in various EU languages.

Explosion protection

- None
- With ATEX, Type of protection:
 - "Intrinsic safety (Ex ia)"
 - "Explosion-proof (Ex d)"²⁾
 - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)³⁾
 - "Ex nA/ic (Zone 2)"⁴⁾
 - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"³⁾⁵⁾
- FM + CSA intrinsic safe (is)⁶⁾
- FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D³⁾⁵⁾⁶⁾
- With FM + CSA, Type of protection:
 - "Intrinsic Safe and Explosion Proof (is + xp)"¹⁾⁶⁾

A
B
D
P
E
R
F
S
NC

Electrical connection/cable entry

- Screwed gland M20x1.5
- Screwed gland 1/2-14 NPT
- Device plug Han 7D (plastic enclosure) incl. mating connector⁷⁾
- Device plugs M12 (stainless steel)^{8) 9)}

B
C
D
F

Display

- Without display
- Without visible display (display concealed, setting: mA)
- With visible display (setting mA)
- With customer-specific display (setting as specified, Order code "Y21" or "Y22" required)

0
1
6
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:

- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- 1) Not in conjunction with Electrical connection "device plug Han 7D".
- 2) Without cable gland, with blanking plug.
- 3) With enclosed cable gland Ex ia and blanking plug.
- 4) Configurations with device plugs Han and M12 are only available in Ex ic.
- 5) Only in connection with IP66.
- 6) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 7) Only in connection with Ex approval A, B or E.
- 8) M12 delivered without cable socket
- 9) Only in connection with Ex approval A, B, E or F.

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-	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		1Y- - - - -	
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/DIN EN 61518 - Mounting thread M10 to DIN 19213 (only for replacement requirement)		2	
		0	
Non-wetted parts materials			
process flange screws	Electronics enclosure		
Stainless steel	Die-cast aluminum	2	
Stainless steel	Stainless steel precision casting	3	
Version			
- Standard version, German plate inscription, setting for pressure unit: bar - International version, English plate inscription, setting for pressure unit: bar - Chinese version, English plate inscription, setting for pressure unit: Pascal		1	
		2	
		3	
All versions include DVD with compact operating instructions in various EU languages.			
Explosion protection			
- None - With ATEX, Type of protection: "Intrinsic safety (Ex ia)" "Explosion-proof (Ex d)"¹⁾ "Intrinsic safety and flameproof enclosure (Ex ia + Ex d)"²⁾ "Ex nA/ic (Zone 2)"³⁾ "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"²⁾⁴⁾ - FM + CSA intrinsic safe (is)⁵⁾ - FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D²⁾⁴⁾⁵⁾ - With FM + CSA, Type of protection: "Intrinsic Safe and Explosion Proof (is + xp)"¹⁾⁵⁾		A	
		B	
		D	
		P	
		E	
		R	
		F	
		S	
		NC	
Electrical connection/cable entry			
- Screwed gland M20 x 1.5 - Screwed gland 1/2-14 NPT - Device plugs M12 (stainless steel)^{6) 7)}		B	
		C	
		F	
Display			
- Without display - Without visible display (display concealed, setting: bar) - With visible display (setting: bar) - With customer-specific display (setting as specified, Order code "Y21" required)		0	
		1	
		6	
		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:

- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- Without cable gland, with blanking plug.
- With enclosed cable gland Ex ia and blanking plug.
- Configurations with device plugs Han and M12 are only available in Ex ic.
- Only in connection with IP66.
- Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- M12 delivered without cable socket
- Only in connection with Ex approval A, B, E or F.

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

1

Selection and Ordering data		Order code			
Further designs			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	✓	✓	✓	✓
• FPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	✓	✓
• NBR (Buna N)	A23	✓	✓	✓	✓
Device plugs¹⁾					
• Han 7D (metal)	A30	✓			
• Han 8D (instead of Han 7D)	A31	✓			
• Angled	A32	✓			
• Han 8D (metal)	A33	✓			
Sealing screw					
1/4-18 NPT, with vent valve in mat. of process flanges	A40	✓	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))		A50	✓	✓	✓
Rating plate inscription (instead of German)					
• English	B11	✓	✓	✓	✓
• French	B12	✓	✓	✓	✓
• Spanish	B13	✓	✓	✓	✓
• Italian	B14	✓	✓	✓	✓
• Cyrillic (russian)	B16	✓	✓	✓	✓
English rating plate		B21	✓	✓	✓
Pressure units in inH ₂ O and/or psi					
Quality test certificate, 5-point factory calibration (IEC 60770-2)		C11	✓	✓	✓
Inspection certificate		C12	✓	✓	✓
Acc. to EN 10204-3.1					
Factory certificate		C14	✓	✓	✓
Acc. to EN 10204-2.2					
Inspection certificate (EN 10204-3.1)		C15	✓	✓	✓
PMI test of parts in contact with medium					
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 ²⁾		✓	
Functional safety (SIL2/3)		C23	✓		
Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration					
PED for Russia with initial calibration mark		C99	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA		D05	✓		
Degree of protection IP66/IP68 (only for M20x1.5 and 1/2-14 NPT)		D12	✓	✓	✓
Supplied with oval flange (1 item), PTFE packing and screws in thread of process flange		D37	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included		D59	✓	✓	✓

Selection and Ordering data		Order code			
Further designs			HART	PA	FF
Add "-Z" to Article No. and specify Order code.					
Use on zone 1D / 2D³⁾ (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)		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	✓	✓	✓
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 d) (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⁾	✓	✓	✓
Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)		E57 ⁴⁾	✓	✓	✓
Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China) (only for transmitter 7MF4...-.....-R..)		E58 ⁴⁾	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)		E70 ⁴⁾	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)		E80	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)		E81	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)		E82	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)		E83	✓	✓	✓
Two coats of lacquer on enclosure and cover (PU on epoxy)		G10	✓	✓	✓
Replacement of process connection side		H01	✓	✓	✓

Selection and Ordering data	Order code			
<i>Further designs</i>		HART	PA	FF
Add "-Z" to Article No. and specify Order code.				
Transient protector 6 kV (lightning protection)	J01	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)⁵⁾	J08	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)⁵⁾	J09	✓	✓	✓

1) Device plug Han IP65

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

3) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

4) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

5) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

Selection and Ordering data	Order code			
<i>Additional data</i>		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 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)	Y22³⁾ + 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

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

1

Selection and Ordering data

Article No. Order code

Mounting flange

Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Connection to EN 1092-1

Nominal diameter Nominal pressure

DN 25	PN 10/16/25/40	Z	J 0 A
	PN 63/100/160	Z	J 0 B
DN 40	PN 10/16/25/40	Z	J 0 C
	PN 63/100	Z	J 0 D
	PN 160	Z	J 0 E
DN 50	PN 10/16/25/40	A	
	PN 100	B	
DN 80	PN 10/16/25/40	D	
DN 100	PN 10/16	G	
	PN 25/40	H	

Connection to ASME B16.5

Nominal diameter Nominal pressure

1 inch	class 150	Z	J 6 A
	class 300	Z	J 6 B
	class 400/600	Z	J 6 C
	class 900/1500	Z	J 6 D
1½ inch	class 150	Z	J 6 E
	class 300	Z	J 6 F
	class 400/600	Z	J 6 G
	class 900/1500	Z	J 6 H
2 inch	class 150	L	
	class 300	M	
	class 400/600	N	
	class 900/1500	P	
3 inch	class 150	Q	
	class 300	R	
4 inch	class 150	T	
	class 300	U	

Flange acc. to JIS

Nominal diameter Nominal pressure

JIS DN 50	10 K 316L	Z	J 7 A
	20 K 316L	Z	J 7 B
JIS DN 80	10 K 316L	Z	J 7 C
	20 K 316L	Z	J 7 D

Other version, add Order code and plain text:
Nominal diameter: ...; Nominal press.: ...

Wetted parts materials

- Stainless steel 316L
 - Coated with PFA
 - Coated with PTFE
 - Coated with ECTFE¹⁾
- Monel 400, mat. no. 2.4360
- Hastelloy C276, mat. no. 2.4819
- Hastelloy C4, mat. no. 2.4602
- Hastelloy C22, mat. no. 2.4602
- Tantalum
- Titanium, mat. no. 3.7035 (max. 150 °C (302 °F))
- Nickel 201 (max. 260 °C (500 °F))
- Duplex 2205, mat. no. 1.4462
- Duplex 2205, mat. no. 1.4462, incl. main body
- Stainless steel 316L, gold plated, thickness approx. 25 µm

Tube length

- without tube

Other version: add Order code and plain text:
material of parts in contact with medium:,
tubus length:

Selection and Ordering data

Article No. Order code

Mounting flange

Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series

Customer-specific tubus length

Specify customer-specific length with Y44, see Order Code

- Wetted parts materials: Stainless steel without foil

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	A 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	A 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	A 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	A 4
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	A 5

- Wetted parts materials: Stainless steel coated with ECTFE

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	F 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	F 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	F 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	F 4
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	F 5

- Wetted parts materials: Stainless steel coated with PFA

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	D 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	D 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	D 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	D 4
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	D 5

- Wetted parts materials: Monel 400

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	G 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	G 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	G 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	G 4

- Wetted parts materials: Hastelloy C276

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	J 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	J 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	J 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	J 4

- Wetted parts materials: Tantalum

Range	Standard length	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	K 1
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	K 2
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	K 3
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	K 4

Filling liquid

- Silicone oil M5
- Silicone oil M50
- High-temperature oil
- Halocarbon oil (for O₂-measurement)²⁾
- Food oil (FDA-listed)

Other version, add
Order code and plain text:
filling liquid: ...

¹⁾ For vacuum on request

²⁾ Oil and grease-free cleaning according to DIN 25410, level 2, and packaging included in scope of delivery. Refer to "Further designs" C10 and E10.

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P DS III

for level

1

Selection and Ordering data	Order code			
Further designs		HART	PA	FF
Add "-Z" to Article No. and specify Order code.				
Customer-specific tubus length Select range, enter desired length in plain text (No entry = standard length)	Y44	✓	✓	✓
Spark arrester For mounting on zone 0 (incl. documentation)	A01	✓	✓	✓
Remote seal nameplate attached out of stainless steel, contains Article No. and order number of the remote seal supplier	B20	✓	✓	✓
Oil- and grease-free cleaned version Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2	C10	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)	C11	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1	C12	✓	✓	✓
2.2 Certificate of FDA approval of fill oil Only in conjunction with filling liquid "Food oil" (FDA listed)"	C17	✓	✓	✓
"Functional safety (SIL2)" certificate to IEC 61508 (only for conjunction with the Order code "C20" in the case of SITRANS P DS III transmitter)	C20	✓	✓	
"Functional safety (SIL2/3)" certificate to IEC 61508 (only for conjunction with the Order code "C23" in the case of SITRANS P DS III transmitter)	C23	✓	✓	
Certification acc. to NACE MR-0175 Includes inspection certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	D07	✓	✓	✓
Certification acc. to NACE MR-0103 Includes inspection certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	D08	✓	✓	✓
Oil- and grease-free cleaned version Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2	E10	✓	✓	✓
Epoxy painting Not possible with negative pressure service 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 EN 837-1.	E15	✓	✓	✓

Selection and Ordering data	Order code			
Further designs		HART	PA	FF
Add "-Z" to Article No. and specify Order code.				
One sided-mounting, sealing surface below	H20			
Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm) previously DIN 2501, form E	J11	✓	✓	✓
Sealing surface groove, EN 1092-1, form D instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)	J14	✓	✓	✓
Sealing surface with spring according to EN 1092-1, form F, (previously DIN 2512, form F) in stainless steel 316L				
DN 25	J30	✓	✓	✓
DN 40	J31	✓	✓	✓
DN 50	J32	✓	✓	✓
DN 80	J33	✓	✓	✓
DN 100	J34	✓	✓	✓
DN 125	J35	✓	✓	✓
Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L				
DN 25	J40	✓	✓	✓
DN 40	J41	✓	✓	✓
DN 50	J42	✓	✓	✓
DN 80	J43	✓	✓	✓
DN 100	J44	✓	✓	✓
DN 125	J45	✓	✓	✓
Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L				
DN 25	J50	✓	✓	✓
DN 40	J51	✓	✓	✓
DN 50	J52	✓	✓	✓
DN 80	J53	✓	✓	✓
DN 100	J54	✓	✓	✓
DN 125	J55	✓	✓	✓
Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA instead of sealing surface B2 or RFSF (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)	J12	✓	✓	✓
Sealing surface RJF (groove, previously RTJ) ASME B16.5 instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)	J24	✓	✓	✓
Elongated pipe, 150 mm instead of 100 mm, max. medium temperature 250 °C, observe the maximum permissible media temperature of the filling liquid.	R15	✓	✓	✓
Elongated pipe, 200 mm instead of 100 mm, max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	R20	✓	✓	✓
Negative pressure service for use in the low-pressure measuring range for transmitter for level Note: suffix "Y01" required with pressure transmitter	V04	✓	✓	✓
Extended negative pressure service for use in the low-pressure measuring range for transmitter for level Note: suffix "Y01" required with pressure transmitter ✓ = available	V54	✓	✓	✓

Pressure Measurement

Pressure transmitters

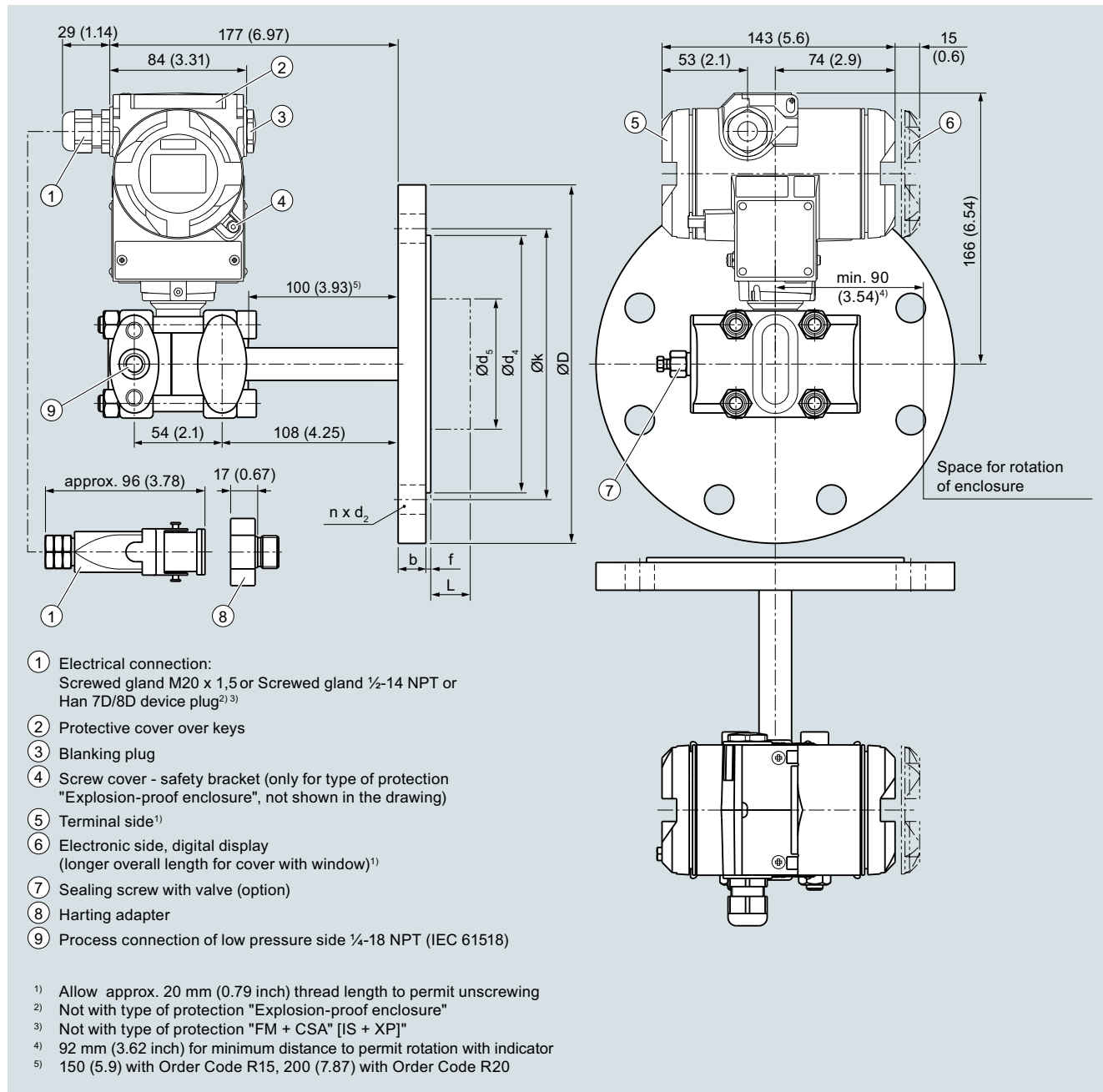
for applications with advanced requirements (Advanced)

SITRANS P DS III

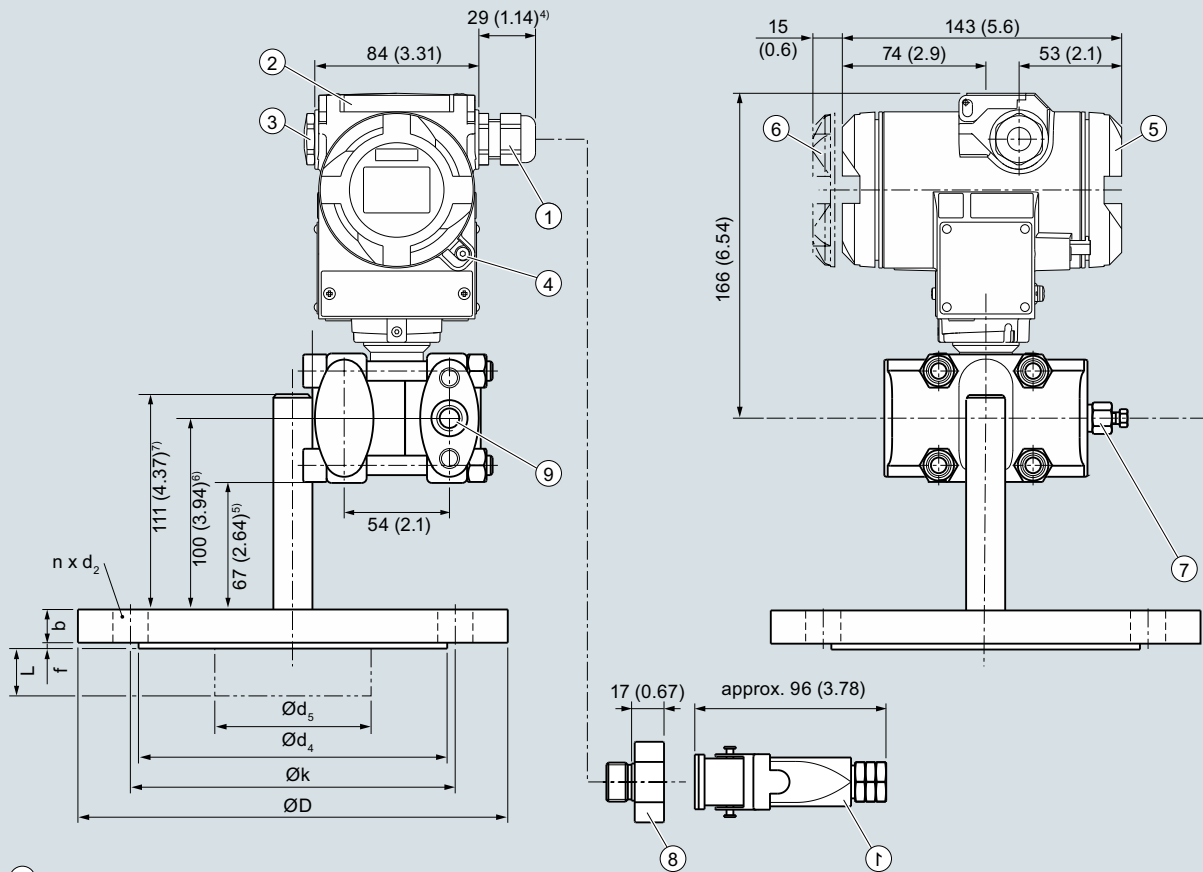
for level

1

Dimensional drawings



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



- ① Electrical connection:
Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or
Han 7D/8D device plug^{2) 3)}
- ② Protective cover over keys
- ③ Blanking plug
- ④ Screw cover - safety bracket (only for type of protection
"Explosion-proof enclosure", not shown in the drawing)
- ⑤ Terminal side¹⁾
- ⑥ Electronic side, digital display
(longer overall length for cover with window)¹⁾
- ⑦ Sealing screw with valve (option)
- ⑧ Harting adapter
- ⑨ Process connection of low pressure side 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⁾ For Pg 13,5 with adapter approx. 45 mm (1.77 inch)

⁵⁾ 117 (4.61) with Order Code R15, 167 (6.57) with Order Code R20

⁶⁾ 150 (5.19) with Order Code R15, 200 (7.87) with Order Code R20

⁷⁾ 161 (6.34) with Order Code R15, 211 (8.31) with Order Code R20

SITRANS P DS III with HART pressure transmitters for level, including mounting flange, one sided-mounting, sealing surface below (order code H20), dimensions in mm (inch)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

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	4	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.

Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
Replacement measuring cell for pressure for SITRANS P DS III		7MF4990 - ■ ■ ■ ■ 0 - 0 DB 0	Replacement measuring cell for absolute pressure for SITRANS P DS III (from the pressure series)		7MF4992 - ■ ■ ■ ■ 0 - 0 DB 0
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	Measuring cell cleaning		Measuring cell filling	Measuring cell cleaning	
Silicone oil	Normal	1	Silicone oil	Normal	1
Inert liquid	grease-free to cleanliness level 2	3	Inert liquid	grease-free to cleanliness level 2	3
Measured span (min. ... max.)			Measured span (min. ... max.)		
8.3 ... 250 mbar	(0.12 ... 3.6 psi)	A	8.3 ... 250 mbar a	(0.12 ... 3.63 psi a)	D
0.01 ... 1 bar	(0.15 ... 14.5 psi)	B	43 ... 1300 mbar a	(0.62 ... 18.86 psi a)	F
0.04 ... 4 bar	(0.6 ... 58 psi)	C	0.16 ... 5 bar a	(2.32 ... 72.5 psi a)	G
0.16 ... 16 bar	(2.32 ... 232 psi)	D	1 ... 30 bar a	(14.5 ... 435 psi a)	H
0.63 ... 63 bar	(9.14 ... 914 psi)	E	Wetted parts materials		
1.6 ... 160 bar	(23.2 ... 2 320 psi)	F	Seal diaphragm	Process connection	
4.0 ... 400 bar	(58.0 ... 5 802 psi)	G	Stainless steel	Stainless steel	A
7.0 ... 700 bar	(102.0 ... 10 153 psi)	J	Hastelloy	Stainless steel	B
Wetted parts materials			Hastelloy	Hastelloy	C
Seal diaphragm	Process connection		Process connection		
Stainless steel	Stainless steel	A	• Connection shank G½B to EN 837-1		0
Hastelloy	Stainless steel	B	• Female thread ½-14 NPT		1
Hastelloy	Hastelloy	C	• Oval flange made of stainless steel, max. measuring span 160 bar (2320 psi)		
Process connection			- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		2
• Connection shank G½B to EN 837-1		0	- Mounting thread M10 to DIN 19213		3
• Female thread ½-14 NPT		1	Further designs		Order code
• Oval flange made of stainless steel, max. measuring span 160 bar (2320 psi)			Please add "-Z" to Article No. and specify Order code.		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		2	Inspection certificate		C12
- Mounting thread M10 to DIN 19213		3	to EN 10204-3.1		
Further designs		Order code	Inspection certificate		C12
Please add "-Z" to Article No. and specify Order code.			to EN 10204-3.1		
Inspection certificate		C12			
to EN 10204-3.1					

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

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 - - 0 DC 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
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 ... 3.63 psi a)	D
43 ... 1300 mbar a (0.62 ... 18.86 psi a)	F
0.16 ... 5 bar a (2.32 ... 72.5 psi a)	G
1 ... 30 bar a (14.5 ... 435 psi a)	H
5.3 ... 100 bar a (76.9 ... 1450 psi a)	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/DIN EN 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/DIN EN 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
• FPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	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 measuring 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 - - 0 DC 0
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
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/DIN EN 61518	2
• Vent on side of process flange	
- Mounting thread M10 to DIN 19213	4
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 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
• FPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	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. measuring span 250, 1600, 5000 and 30000 mbar (100 inH₂O, 642 inH₂O, 2000 inH₂O and 435 psi).

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
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Normal	1
Measured span (min. ... max.)		
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
Gold ¹⁾	Gold	L
Process connection		
Female thread 1/4-18 NPT with flange connection		
- Sealing screw opposite process connection - Mounting thread M12 to DIN 19213 - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 - Vent on side of process flange - Mounting thread M12 to DIN 19213 - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		1 3 5 7
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) - FEP (with silicone core, approved for food) - FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F)) - NBR (Buna N)		A20 A21 A22 A23
Inspection certificate		C12
to EN 10204-3.1		
Stainless steel process flanges for vertical differential pressure lines		H03
without process flanges		K00

¹⁾ Not together with max. measuring span 600 mbar (240 inH₂O)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

Accessories/Spare Parts

1

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
Spare parts/Accessories		Digital indicator Including mounting material for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus	7MF4997-1BR
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 304/1.4301 • made of stainless steel 316L/1.4404	7MF4997-1AB 7MF4997-1AH 7MF4997-1AP	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...:
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 304/1.4301 • made of stainless steel 316L/1.4404	7MF4997-1AC 7MF4997-1AJ 7MF4997-1AQ	Mounting screws For measuring point label, grounding and connection terminals or for display (50 units)	7MF4997-1CD
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 304/1.4301 • made of stainless steel 316L/1.4404	7MF4997-1AD 7MF4997-1AK 7MF4997-1AR	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 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 304/1.4301 • made of stainless steel 316L/1.4404	7MF4997-1AE 7MF4997-1AL 7MF4997-1AS	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 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 304/1.4301 • made of stainless steel 316L/1.4404	7MF4997-1AF 7MF4997-1AM 7MF4997-1AT	Application 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
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. Compatible for Ex and non-Ex transmitters • without window • with window	7MF4997-1BB 7MF4997-1BE	Connection board • for SITRANS P DS III • for SITRANS P DS III PROFIBUS PA and FOUNDATION Fieldbus	7MF4997-1DN 7MF4997-1DP
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. Compatible for Ex and non-Ex transmitters • without window • with window	7MF4997-1BC 7MF4997-1BF	O-rings for process flanges made of: • FPM (Viton) • PTFE (Teflon) • FEP (with silicone core, approved for food) • FFPM (Kalrez) • NBR (Buna N)	7MF4997-2DA 7MF4997-2DB 7MF4997-2DC 7MF4997-2DD 7MF4997-2DE
		Sealing ring for process connection	see "Fittings"
		Weldable sockets for PMC connection • PMC Style Standard: Thread 1½" • PMC Style Minibolt: front-flush 1"	7MF4997-2HA 7MF4997-2HB
		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 FKM (Viton); temperature range: -20 ... +200 °C (-4 ... +392 °F), 10 units • DN 25, PN 40 (M11) • 1", class 150 (M40)	7MF4997-2HH 7MF4997-2HK

Selection and Ordering data	Article No.
Documentation The entire documentation is available for download free-of-charge in various languages at: http://www.siemens.com/processinstrumentation/documentation Compact operating instructions SITRANS P DS III/P410 • English, German, Spanish, French, Italian, Dutch	A5E03434626
Certificates (order only via SAP) instead of Internet download • hard copy (to order) • on DVD (to order)	A5E03252406 A5E03252407
HART modem with USB interface	7MF4997-1DB

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

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Overview

SITRANS P transmitters

- DS III for relative and absolute pressure (both designs) and
- DS III for differential pressure

can be delivered factory-fitted with the following valve manifolds:

- 7MF9011-4EA and 7MF9011-4FA valve manifolds for gauge pressure and absolute pressure transmitters
- 7MF9411-5BA and 7MF9411-5CA valve manifolds for absolute pressure and differential pressure transmitters

Design

The 7MF9011-4EA valve manifolds are sealed with PTFE gaskets between the transmitter and the valve manifold as standard. Soft iron, stainless steel and copper gaskets are also available for sealing purposes if preferred.

The 7MF9011-4FA valve manifolds are sealed with PTFE sealing tape between the transmitter and the valve manifold.

The 7MF9411-5BA and 7MF9411-5CA valve manifolds are sealed with PTFE gaskets between the transmitter and the valve manifold.

The complete unit is checked for leaks under pressure after assembly (air pressure 6 bar (87 psi)) and certified with a factory certificate according to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the corresponding mounting brackets. The transmitters are mounted on the valve manifold and not on the unit itself.

If you order a mounting bracket when choosing the option "Factory mounting of valve manifolds", you will receive a mounting bracket for the valve manifold instead of a bracket for mounting the transmitter.

If you order an inspection certificate 3.1 according to EN 10204 after choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitter and for the valve manifold.

Selection and Ordering data**7MF9411-5AA
valve manifold for relative and absolute pressure transmitters**

Add „**Z**“ to the Article No. of the transmitter and add order codes.

Order code

SITRANS P DSIII
7MF403-...2-..., 7MF423-...2-... ,
7MF403-...3-..., 7MF423-...3-... ,
7MF403-...4-..., 7MF423-...4-...

T05

With process connection oval flange with PTFE gasket and **steel** mounting screws.

Delivery including high-pressure test certified by factory certificate according to EN 10204-2.2

Additional versions:

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)

A02

Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold

C12

With manufacturer declaration according to NACE, MR-0175

D07

**7MF9411-5AA
valve manifold for relative and absolute pressure transmitters**

Add „**Z**“ to the Article No. of the transmitter and add order codes.

Order code

SITRANS P DSIII
7MF403-...2-..., 7MF423-...2-... ,
7MF403-...3-..., 7MF423-...3-... ,
7MF403-...4-..., 7MF423-...4-...

T06

With process connection oval flange with PTFE gasket and **stainless steel** mounting screws.

Delivery including high-pressure test certified by factory certificate according to EN 10204-2.2

Additional versions:

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)

A02

Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold

C12

With manufacturer declaration according to NACE, MR-0175

D07

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

Factory-mounting of valve manifolds on transmitters

1

7MF9011-4FA valve manifold on relative and absolute pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII
7MF403.-...1.-..., 7MF423.-...1.-...
With process connection
female thread 1/2-14 NPT
in-sealed with PTFE sealing tape
Delivery incl. high-pressure test certified
by factory certificate according to
EN 10204-2.2

Order
code

T03

Further designs:

Delivery includes mounting brackets and
mounting clips made of stainless steel
(instead of the mounting bracket supplied
with the transmitter)

A02

Inspection certificate according to
EN 10204-3.1 supplied for transmitters
and mounted valve manifold

C12

With manufacturer declaration according
to NACE, MR-0175

D07

7MF9011-4EA

valve manifold on relative and absolute pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII
7MF403.-...0.-..., 7MF423.-...0.-...
with process connection
collar G1/2 A to EN 837-1
with gasket made of PTFE between valve
manifold and transmitter

Order
code

T02

Alternative sealing material:

- Soft iron
- Stainless steel, Mat. No. 14571
- copper

A70

A71

A72

Delivery incl. high-pressure test certified
by factory certificate according to
EN 10204-2.2

Further designs:

Delivery includes mounting brackets and
mounting clips made of stainless steel
(instead of the mounting bracket supplied
with the transmitter)

A02

Inspection certificate according to
EN 10204-3.1 supplied for transmitters
and mounted valve manifold

C12

With manufacturer declaration according
to NACE, MR-0175

D07

7MF9411-5BA valve manifold on absolute and differential pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII
7MF433.-..., 7MF443.-... and
7MF453.-...¹⁾
mounted with gaskets made of PTFE and
screws made of
• chromized steel
• made of stainless steel
Delivery incl. high-pressure test certified
by factory certificate according to
EN 10204-2.2

Order
code

U01

U02

Further designs:

Delivery includes mounting bracket and
mounting clips made of

- Steel
 - Stainless steel
- (instead of the mounting bracket supplied
with the transmitter)

A01

A02

Inspection certificate according to
EN 10204-3.1 supplied for transmitters
and mounted valve manifold

C12

With manufacturer declaration according
to NACE, MR-0175

D07

7MF9411-5CA valve manifold on differential pressure transmitters



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII
7MF443.-... and 7MF453.-...¹⁾
mounted with gaskets made of PTFE and
screws made of
• chromized steel
• Stainless steel
Delivery incl. high-pressure test certified
by factory certificate according to
EN 10204-2.2

Order
code

U03

U04

Further designs:

Delivery includes mounting bracket and
mounting clips made of

- Steel
 - Stainless steel
- (instead of the mounting bracket supplied
with the transmitter)

A01

A02

Inspection certificate according to
EN 10204-3.1 supplied for transmitters
and mounted valve manifold

C12

With manufacturer declaration according
to NACE, MR-0175

D07

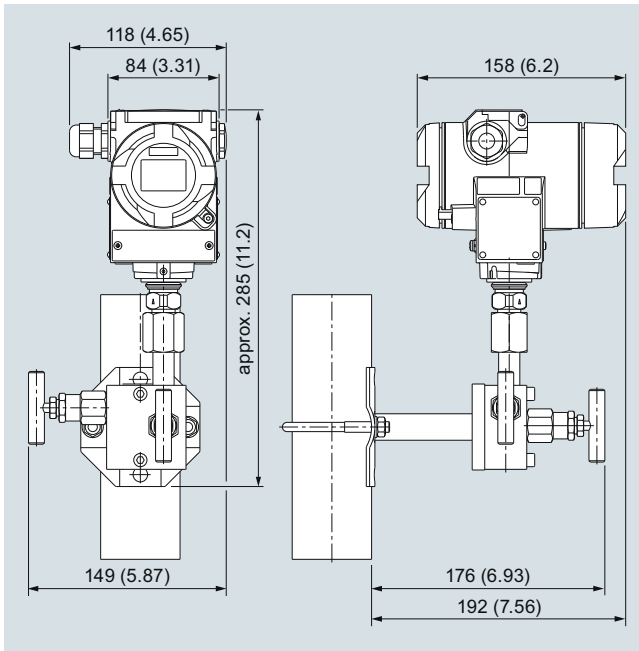
¹⁾ For 7MF453.-... transmitters, you require a 7/10-20 UNF connection thread in the process flange

Dimensional drawings**Valve manifolds mounted on SITRANS P DS III**

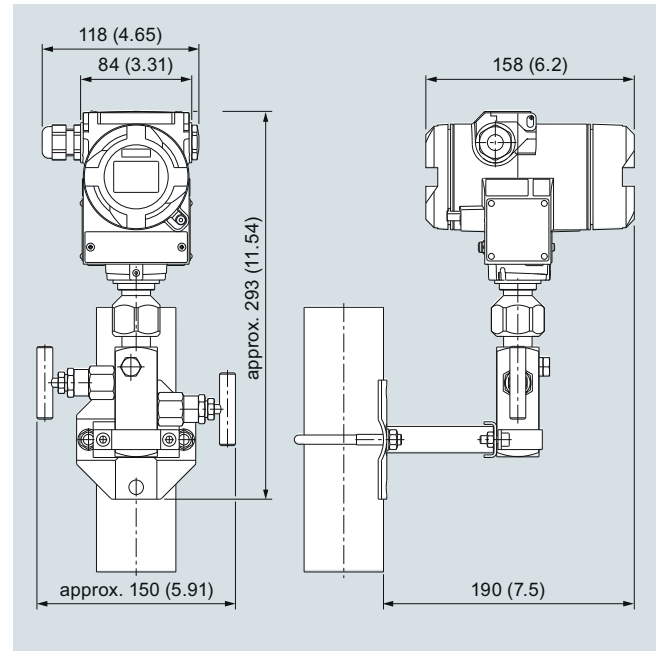
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters



7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters



7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)



7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

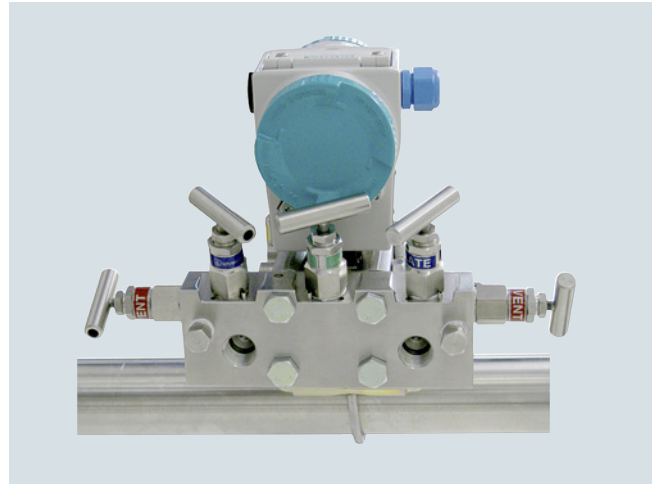
SITRANS P DS III

1

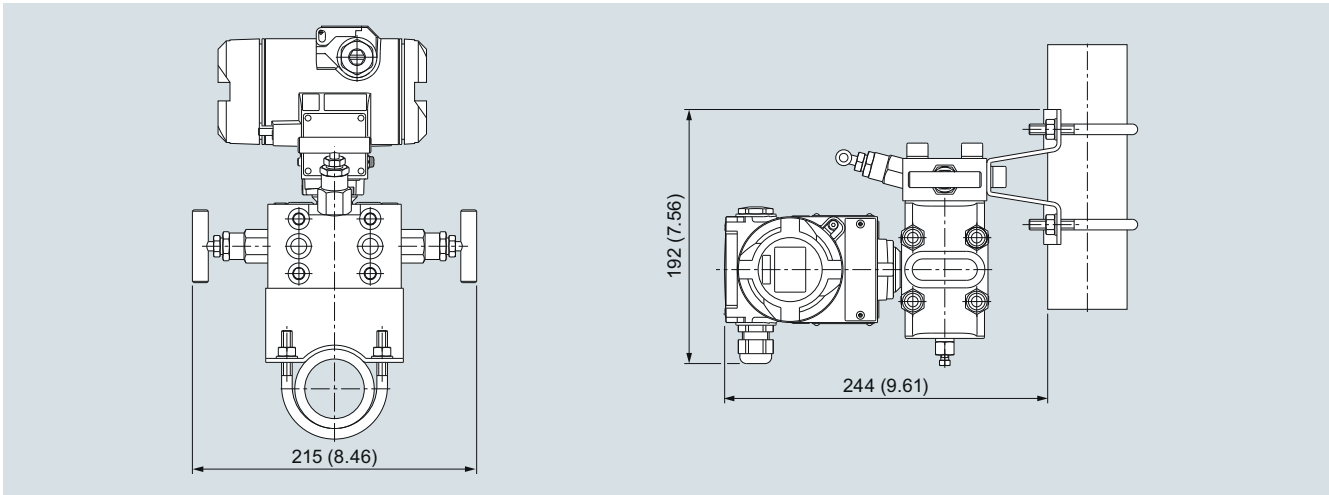
Factory-mounting of valve manifolds on transmitters



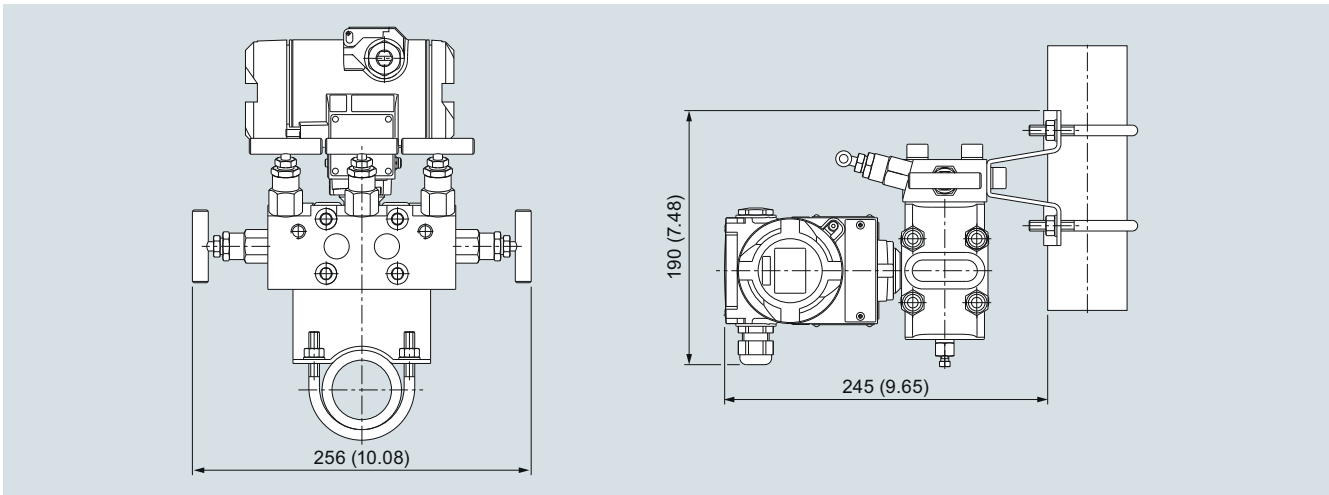
7MF9411-5BA valve manifold with mounted differential pressure transmitter



7MF9411-5CA valve manifold with mounted differential pressure transmitter



7MF9411-5BA valve manifold with mounted differential pressure transmitter, dimensions in mm (inch)



7MF9411-5CA valve manifold with mounted differential pressure transmitter, dimensions in mm (inch)