

## Overview



The SITRANS P300 is a digital pressure transmitter for relative and absolute pressure. The conventional thread versions are available as process connections, as are flush-mounted versions. A large number of the flush-mounted versions are suitable for food and pharmaceutical applications, and satisfy the EHEDG and 3A hygiene requirements.

The output signal is a load-independent direct current from 4 to 20 mA or a PROFIBUS PA or FOUNDATION signal, which is linearly proportional to the input pressure. Communication is via HART protocol or PROFIBUS PA interface. Convenient buttons for easy local operation of the basic settings of the pressure transmitter.

The SITRANS P300 has a single-chamber stainless steel enclosure. The pressure transmitter is approved with "intrinsically safe" type of protection. It can be used in zone 1 or zone 0.

## Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- Extensive diagnosis and simulation functions
- Minimum conformity error
- Small long-term drift
- Wetted parts made of high-grade materials (such as stainless steel, Hastelloy)
- Measuring range 0.008 bar to 400 bar (0.1 psi to 5802 psi)
- High measuring accuracy
- Parameterization over control keys and HART or PROFIBUS PA or FOUNDATION Fieldbus

## Application

The pressure transmitter is available in versions for gauge pressure and for absolute pressure. The output signal is always a load-independent direct current from 4 to 20 mA or a PROFIBUS PA or FOUNDATION Fieldbus signal, which is linearly proportional to the input pressure. The pressure transmitter measures aggressive, non-aggressive and hazardous gases, as well as vapors and liquids.

It can be used for the following measurement types:

- Gauge pressure
- Absolute pressure

With appropriate parameter settings, it can also be used for the following additional measurement types:

- Level
- Volume
- Mass

The "intrinsically-safe" Ex version of the transmitter can be installed in hazardous areas (zone 1). The transmitters are provided with an EC type examination certificate and comply with the respective harmonized European standards of ATEX.

### **Gauge pressure**

This variant measures aggressive, non-aggressive and hazardous gases, vapors and liquids.

The smallest measuring span is 0.01 bar (0.15 psi), the largest is 400 bar (5802 psi).

### **Level**

With appropriate parameter settings, the gauge pressure variant measures the level of aggressive, non-aggressive and hazardous liquids.

For measuring the level in an open container you require one device; for measuring the level in a closed container, you require two devices and a process control system.

### **Absolute pressure**

This variant measures the absolute pressure of aggressive, non-aggressive and hazardous gases, vapors and liquids.

The smallest measuring span is 0.008 bar a (0.12 psi a), the largest is 30 bar a (435 psi a).

# Pressure Measurement

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for food, pharmaceuticals and biotechnology

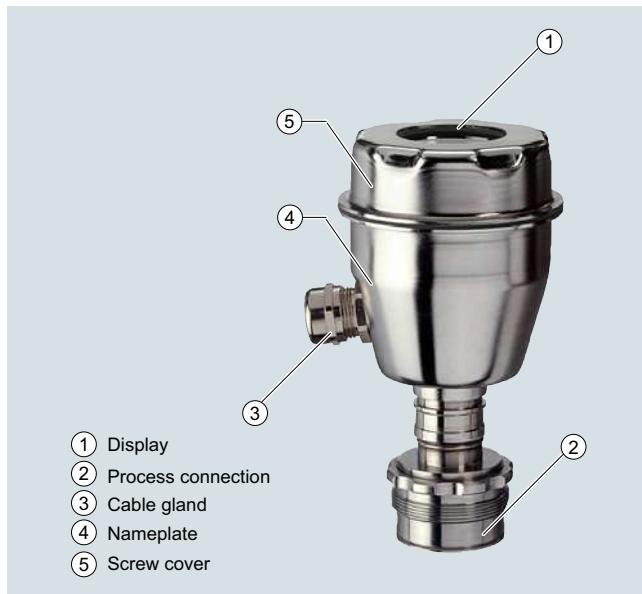
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## SITRANS P300 for gauge and absolute pressure

### Design

The device comprises:

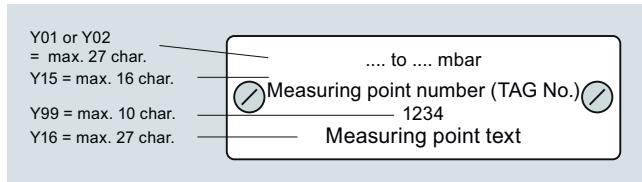
- Electronics
- Enclosure
- Measuring cell



Perspective view of SITRANS P300

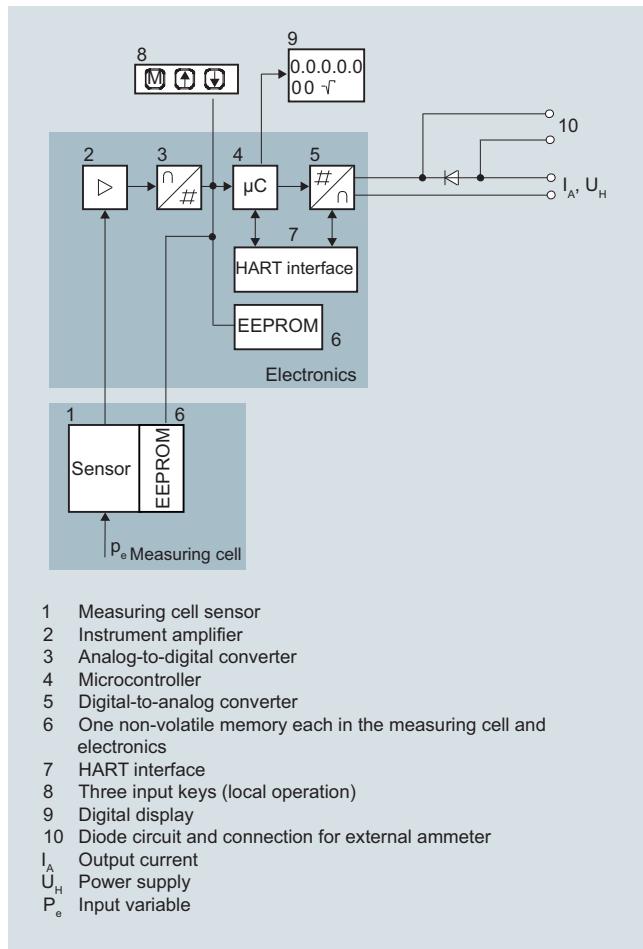
The enclosure has a screw-on lid (5) and, depending on the version, is with or without an inspection window. The electrical terminal enclosure, the buttons for operation of the device are located under this lid and, depending on the version, the display. The connections for the auxiliary power  $U_H$  and the shield are in the terminal enclosure. The cable gland is mounted on the side of the enclosure. The measuring cell with the process connection (2) is located on the bottom of the enclosure. The measuring cell with the process connection may differ from the one shown in the diagram, depending on the device version.

### Example of attached measuring points sign



### Function

#### Operation of electronics with HART communication

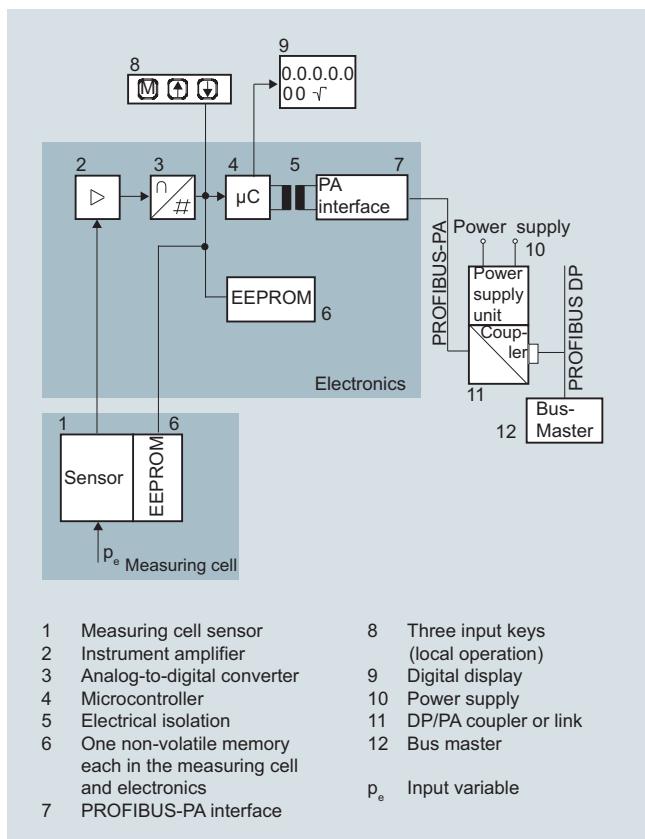


Function diagram of electronics

The input pressure is converted into an electrical signal by the sensor (1). This signal is amplified by the measuring amplifier (2) and digitized in an analog-to-digital converter (3). The digital signal is analyzed in a microcontroller (4) and corrected according to linearity and thermal characteristics. In a digital-to-analog converter (5) it is then converted into the output current of 4 to 20 mA. A diode circuit provides reverse polarity protection. You can make an uninterrupted current measurement with a low-ohm ammeter at the connection (10). The data specific to the measuring cell, the electronic data and parameter settings are stored in two non-volatile memories (6). The first memory is linked to the measuring cell, the second to the electronics.

The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a display (9), you can use this to track mode settings and other messages. The basic mode settings can be changed with a computer via the HART modem (7).

## Operation of electronics with PROFIBUS PA communication

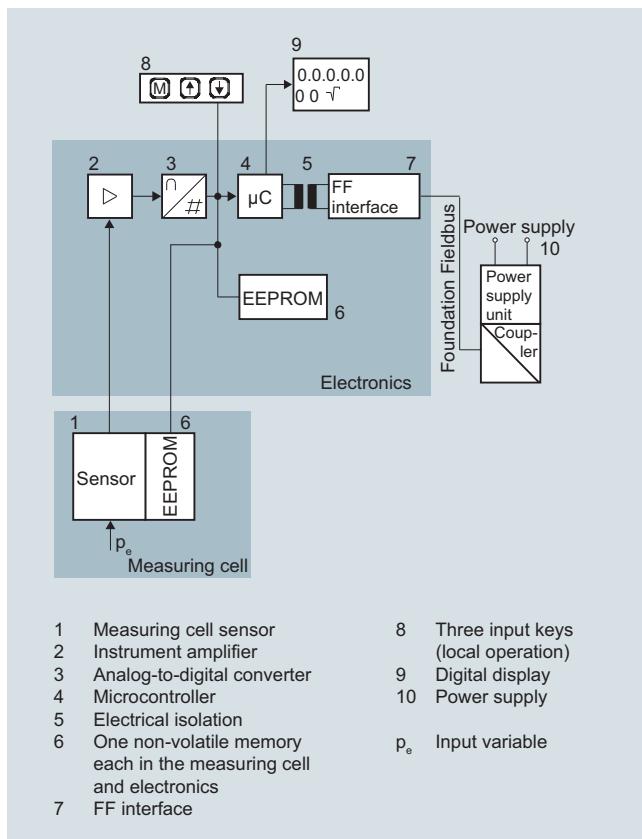


Function diagram of electronics

The input pressure is converted into an electrical signal by the sensor (1). This signal is amplified by the measuring amplifier (2) and digitalized in an analog-to-digital converter (3). The digital signal is analyzed in a microcontroller (4) and corrected according to linearity and thermal characteristics. It is then made available at the PROFIBUS PA over an electrically isolated PROFIBUS PA interface (7). The data specific to the measuring cell, the electronic data and parameter settings are stored in two non-volatile memories (6). The first memory is linked to the measuring cell, the second to the electronics.

The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a display (9), you can use this to track mode settings and other messages. The basic mode settings (12) can be changed with a computer over the bus master.

## 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") 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

The process connections available include the following:

- G1/2
- 1/2-14 NPT
- Flush-mounted diaphragm:
  - Flanges to EN
  - Flanges to ASME
  - NuG and pharmaceutical connections

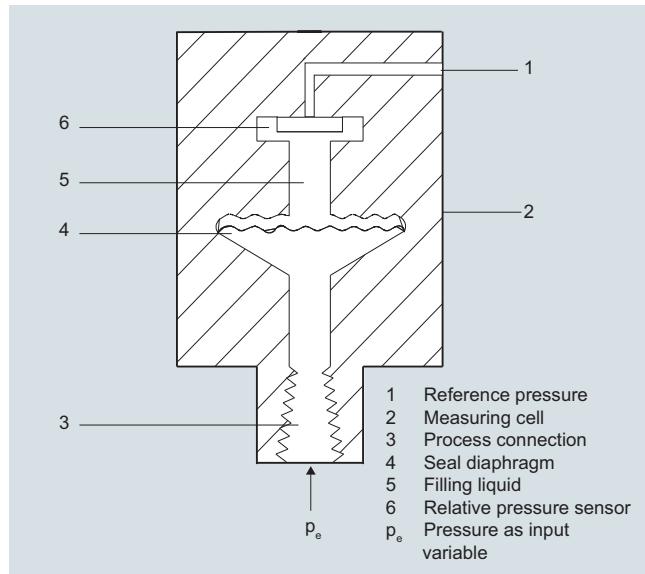
# Pressure Measurement

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1

## SITRANS P300 for gauge and absolute pressure

### Measuring cell for gauge pressure

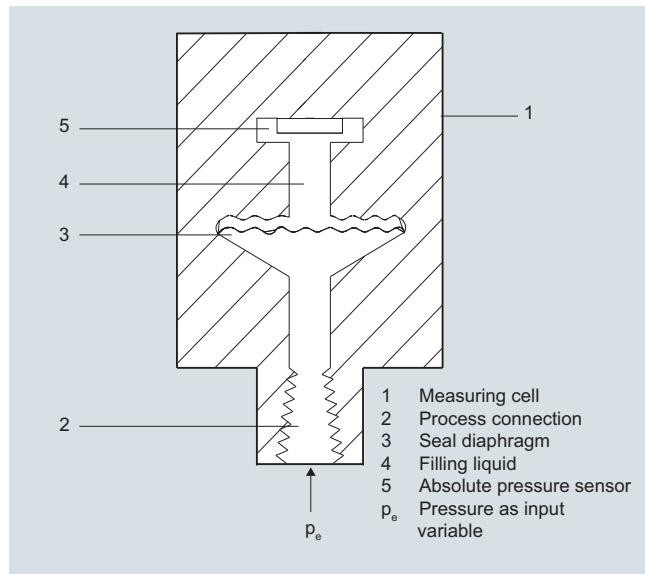


### Measuring cell for gauge pressure, function diagram

The input pressure ( $p_e$ ) is transferred to the gauge pressure sensor (6) via the seal diaphragm (4) and the filling liquid (5), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Transmitters with measuring spans  $\leq 63$  bar ( $\leq 926.1$  psi) measure the input pressure compared to atmospheric, transmitters with measuring spans of  $\geq 160$  bar ( $\geq 2352$  psi) compared to a vacuum.

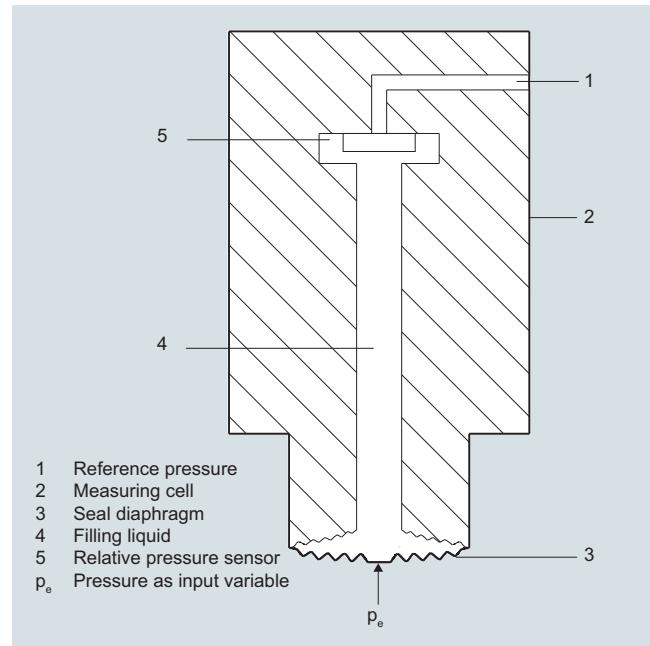
### Measuring cell for absolute pressure



### Measuring cell for absolute pressure, function diagram

The input pressure ( $p_e$ ) is transferred to the absolute pressure sensor (5) via the seal diaphragm (3) and the filling liquid (4), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

### Measuring cell for gauge pressure, front-flush diaphragm

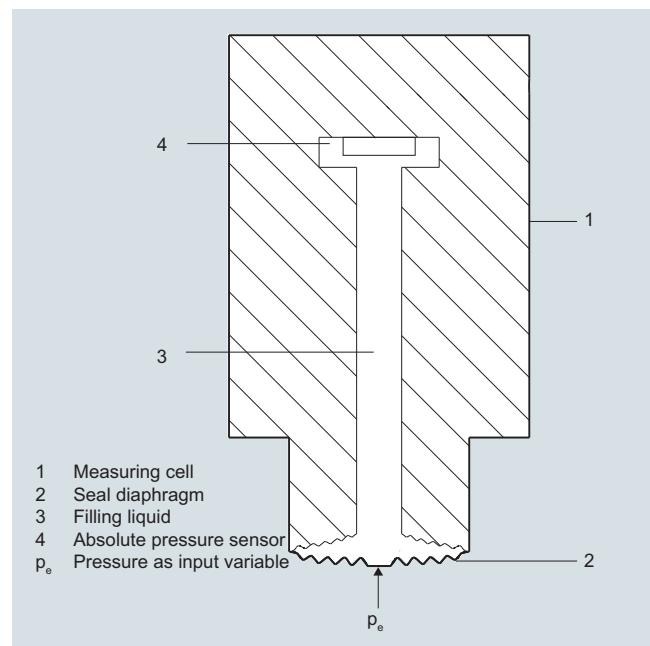


### Measuring cell for gauge pressure, front-flush diaphragm, function diagram

The input pressure ( $p_e$ ) is transferred to the gauge pressure sensor (6) via the seal diaphragm (4) and the filling liquid (5), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Transmitters with measuring spans  $\leq 63$  bar ( $\leq 926.1$  psi) measure the input pressure compared to atmospheric, transmitters with measuring spans of  $\geq 160$  bar ( $\geq 2352$  psi) compared to a vacuum.

### Measuring cell for absolute pressure, front-flush diaphragm



### Measuring cell for absolute pressure, front-flush diaphragm, function diagram

## SITRANS P300 for gauge and absolute pressure

The input pressure ( $p_e$ ) is transferred to the absolute pressure sensor (5) via the seal diaphragm (3) and the filling liquid (4), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

**Parameterization**

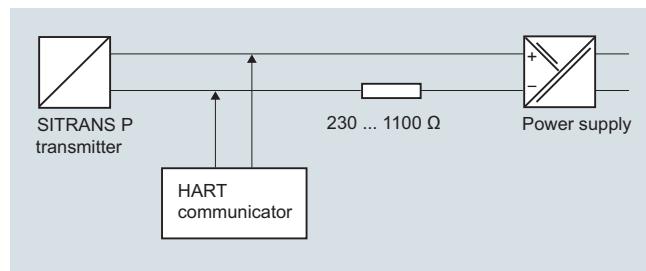
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

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

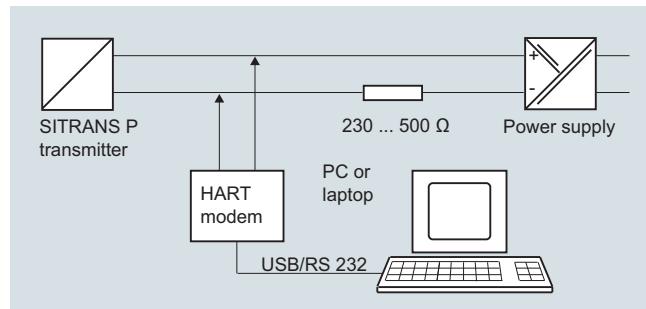
Parameterization using HART communication

Parameterization using HART communication 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 on SITRANS P300 with HART communication

Parameters	Input keys	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 <sup>1)</sup>
Type of dimension and actual dimension	x	x
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

1) Cancel apart from write protection

Diagnostic functions for SITRANS P300 with HART communication

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

Available physical units of display for SITRANS P300 with HART communication

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 <sup>2</sup> , kg/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), mmH <sub>2</sub> O, ftH <sub>2</sub> O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

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1

## SITRANS P300 for gauge and absolute pressure

### Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. The PROFIBUS connects the SITRANS P300 PA 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 P300 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 SITRANS P300 with PROFIBUS PA and FOUNDATION Fieldbus

Adjustable 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
Diagnostic functions		x

### Diagnostic functions for SITRANS P300 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 <sup>2</sup> , kg/cm <sup>2</sup> , mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O (20 °C), mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Mass	g, kg, t, lb, Ston, Lton, oz
Volume	m <sup>3</sup> , dm <sup>3</sup> , hl, yd <sup>3</sup> , ft <sup>3</sup> , in <sup>3</sup> , US gallon, Imp. gallon, bushel, barrel, barrel liquid
volume flow	m <sup>3</sup> /s, m <sup>3</sup> /min, m <sup>3</sup> /h, m <sup>3</sup> /d, l/s, l/min, l/h, l/d, Ml/d, ft <sup>3</sup> /s, ft <sup>3</sup> /min, ft <sup>3</sup> /h, ft <sup>3</sup> /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	%

### Hygiene version

In the case of the SITRANS P300 with 7MF812.-... front-flush diaphragm, selected connections comply with the requirements of the EHEDG or 3A. You will find further details in the order form. Please note in particular that the seal materials used must comply with the requirements of 3A. Similarly, the filling liquids used must be FDA-compliant.

## Technical specifications

### SITRANS P300 for gauge and absolute pressure

#### Gauge pressure input

##### Measured variable

Measuring span (infinitely 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)

HART	PROFIBUS PA/ FOUNDATION Fieldbus		
Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
8.3 ... 250 mbar	250 mbar	4 bar	6 bar
0.83 ... 25 kPa	25 kPa	400 kPa	600 kPa
0.12 ... 3.6 psi	3.6 psi	58 psi	87 psi
0.01 ... 1 bar	1 bar	4 bar	6 bar
1 ... 100 kPa	100 kPa	400 kPa	600 kPa
0.15 ... 14.5 psi	14.5 psi	58 psi	87 psi
0.04 ... 4 bar	4 bar	7 bar	10 bar
4 ... 400 kPa	400 kPa	0.7 MPa	1 MPa
0.58 ... 58 psi	58 psi	102 psi	145 psi
0.16 ... 16 bar	16 bar	21 bar	32 bar
16 ... 1600 kPa	1600 kPa	2.1 MPa	3.2 MPa
2.3 ... 232 psi	232 psi	305 psi	464 psi
0.63 ... 63 bar	63 bar	67 bar	100 bar
63 ... 6300 kPa	6300 kPa	6.7 MPa	10 MPa
9.1 ... 914 psi	914 psi	972 psi	1450 psi
1.6 ... 160 bar	160 bar	167 bar	250 bar
0.16 ... 16 MPa	16 MPa	16.7 MPa	2.5 MPa
23 ... 2321 psi	2321 psi	2422 psi	3626 psi
4 ... 400 bar	400 bar	400 bar	600 bar
0.4 ... 40 kPa	40 kPa	40 MPa	60 MPa
58 ... 5802 psi	5802 psi	5802 psi	8700 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
- 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  
(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 ° (140 °F) ambient temperature/temperature of medium)

#### Absolute pressure input

##### Measured variable

Measuring span (infinitely 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	250 mbar a	1.5 bar a	6 bar a
0.83 ... 25 kPa a	25 kPa a	150 kPa a	600 kPa a
3.35 ... 100 inH <sub>2</sub> O a	100 inH <sub>2</sub> O a	21.8 psi a	87 psi a
0.13 ... 3.63 psi a			
43.34 ... 1300 mbar a	1300 mbar a	2.6 bar a	10 bar a
4.33 ... 130 kPa a	130 kPa a	260 kPa a	1 MPa a
17.42 ... 522.4 inH <sub>2</sub> O a	525 inH <sub>2</sub> O	37.7 psi a	145 psi a
0.63 ... 18.86 psi a			
0.17 ... 5 bar a	5000 mbar a	10 bar a	30 bar a
17 ... 500 kPa a	500 kPa a	1 MPa a	3 MPa a
2.43 ... 72.5 psi a	72.5 psi a	145 psi a	435 psi a
1 ... 30 bar a	30 bar a	45 bar a	100 bar a
0.1 ... 3 MPa a	3 MPa a	4.5 MPa a	10 MPa a
14.6 ... 435 psi a	435 psi a	653 psi a	1450 psi a

# Pressure Measurement

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1

## SITRANS P300 for gauge and absolute pressure

### SITRANS P300 for gauge and absolute pressure

Lower measuring limit	0 mbar a/0 kPa a /0 psi a			
• Measuring cell with silicone oil	30 mbar a/3 kPa a/0.44 psi a			
• Measuring cell with inert filling liquid	30 mbar a + 20 mbar a · (9 - 60 °C)/°C 3 kPa a + 2 kPa a · (9 - 60 °C)/°C 0.44 psi a + 0.29 psi a · (9 - 140 °F)/°F			
- for temperature of medium -20 °C < 9 ≤ +60 °C (-4 °F < 9 ≤ +140 °F)				
- for temperature of medium 60 °C < 9 ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < 9 ≤ +212 °F (max. 185 °F for meas. cell 435 psi))				
Upper measuring limit	100 % of max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi und 60 °C (140 °F) ambient temperature/temperature of medium)			
Lower range value	Between the measuring limits (fully adjustable)			
<b>Input of gauge pressure, with front-flush diaphragm</b>				
Measured variable	Gauge pressure, front-flush			
Measuring span (infinitely adjustable) or nominal measuring range, max. permissible operating pressure and max. test pressure	<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>		
	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 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
Lower measuring limit	100 mbar a/10 kPa a/1.45 psi a			
• Measuring cell with silicone oil filling	100 mbar a/10 kPa a/1.45 psi a			
• Measuring cell with inert filling liquid	100 mbar a/10 kPa a/1.45 psi a			
• Measuring cell with Neobee	100% of max. measuring span			
Upper measuring limit				
<b>Input of absolute pressure, with front-flush diaphragm</b>				
Measured variable	Absolute pressure, front-flush			
Measuring span (infinitely adjustable) or nominal measuring range and max. permissible test pressure	<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>		
	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	43 ... 1300 mbar a 4.3 ... 130 kPa a 17 ... 525 inH <sub>2</sub> O a	1300 mbar a 130 kPa a 525 inH <sub>2</sub> O a	2.6 bar a 260 kPa a 37.7 psi a	10 bar a 1 MPa a 145 psi a
	160 ... 5000 mbar a 16 ... 500 kPa a 2.32 ... 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 14.5 ... 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
	Depending on the process connection, the measuring span may differ from these values			
Lower measuring limit	0 mbar a/0 kPa a/0 psi a			
Upper measuring limit	100 % of max. measuring span			
<b>Output</b>				
Output signal	<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>		
	4 ... 20 mA	Digital PROFIBUS PA or FOUNDATION Fieldbus signal		
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 P300 for gauge and absolute pressure

#### Measuring accuracy for gauge pressure

Reference conditions

Measuring span ratio  $r$  (spread, Turn-Down)

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

According to IEC 60770-1

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

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

- 1 bar/100 kPa/14.5 psi

$r \leq 1.25 : \leq 0.075 \%$   
 $1.25 < r \leq 30 : \leq (0.008 \cdot r + 0.065) \%$

4 bar/400 kPa/58 psi

$r \leq 5 : \leq 0.075 \%$   
 $5 < r \leq 100 : \leq (0.005 \cdot r + 0.05) \%$

16 bar/1.6 MPa/232 psi

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

63 bar/6.3 MPa/914 psi

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

160 bar/16 MPa/2321 psi

$\leq (0.07 \cdot r + 0.08) \%$

- 400 bar/40 MPa/5802 psi

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

- 250 mbar/25 kPa/3.6 psi

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

- 1 bar/100 kPa/14.5 psi

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

- 4 bar/400 kPa/58 psi

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

- 16 bar/1.6 MPa/232 psi

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

- 63 bar/6.3 MPa/914 psi

0.005 % per 1 V

- 160 bar/16 MPa/2321 psi

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

- 400 bar/40 MPa/5802 psi

Effect of mounting position

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

Measuring value resolution for PROFIBUS PA and  
 FOUNDATION Fieldbus

# Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

1

## SITRANS P300 for gauge and absolute pressure

### SITRANS P300 for gauge and absolute pressure

#### Measuring accuracy for absolute pressure

Reference conditions

According to IEC 60770-1

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

Measuring span ratio r (spread, Turn-Down)

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

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
- 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

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

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

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °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 the rated nominal measuring range

#### Measuring accuracy for gauge and absolute pressure, with front-flush diaphragm

Reference conditions

According to IEC 60770-1

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

Measuring span ratio r (spread, Turn-Down)

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

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

-  $r \leq 5$

$\leq 0.075 \%$

-  $5 < r \leq 100$

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

-  $r \leq 10$

-

-  $10 < r \leq 30$

-

Influence of ambient temperature  
(as percentage per 28 °C (50 °F))

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

#### Gauge pressure, with front-flush diaphragm

-

-

$\leq 0.2 \%$

$\leq 0.4 \%$

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

Effect of temperature of medium  
(in pressure per temperature change)

3 mbar/0.3 kPa/0.04 psi per 10 K

- Temperature difference between temperature of medium and ambient temperature

Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

$(0.25 \cdot r) \%$  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 the nominal measuring range

## SITRANS P300 for gauge and absolute pressure

### Operating conditions

#### Installation conditions

Ambient temperature

- Measuring cell with silicone oil
- Measuring cell with Neobee oil (FDA-compliant, with flush-mounted diaphragm)
- Measuring cell with inert liquid
- Display readable
- Storage temperature

Observe the temperature class in areas subject to explosion hazard.

-40 ... +85 °C (-40 ... +185 °F)

-10 ... +85 °C (14 ... +185 °F)

-40 ... +85 °C (-40 ... +185 °F)

-30 ... +85 °C (-22 ... +185 °F)

-50 ... +85 °C (-58 ... +185 °F)

(for Neobee: -20 ... +85 °C (-4 ... +185 °F))

(for temperature oil: -10 ... +85 °C (14 ... +165 °F))

Climatic class

Condensation

Relative humidity 0 ... 100 %

Condensation permissible, suitable for use in the tropics

Degree of protection

- according to EN 60529
- according to NEMA 250

IP65, IP68

IP65, IP68, Type 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F)

Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

#### Medium conditions

Temperature of medium

- Measuring cell with silicone oil
- Measuring cell with silicone oil (FDA-compliant, with flush-mounted diaphragm)
- Measuring cell with Neobee oil "Measuring cell with Neobee oil (FDA-compliant, with flush-mounted diaphragm)
- Measuring cell with silicone oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)
- Measuring cell with Neobee oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)
- Measuring cell with inert liquid
- Measuring cell with high-temperature oil (only for gauge pressure version with flush-mounted diaphragm)

-40 ... +100 °C (-40 ... +212 °F)

-40 ... +150 °C (-40 ... +302 °F)

-10 ... +150 °C (-14 ... +302 °F)

-40 ... +200 °C (-40 ... +392 °F)

-10 ... +200 °C (14 ... +392 °F)

-20 ... +100 °C (-4 ... +212 °F)

-10 ... +250 °C (14 ... 482 °F)

### Design (standard version)

Weight (without options)

Approx. 800 g (1.8 lb)

Enclosure material

Stainless steel, mat. no. 1.4301/304

Material of parts in contact with the medium

• Connection shank

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

• 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

• Inert filling liquid

• G1½B to EN 837-1

• Female thread ½-14 NPT

• Oval flange PN 160 (MAWP 2320 psi) with fastening thread:

-7/16 -20 UNF to IEC 61518/DIN EN 61518

- M10 as per DIN 19213

Process connection

# Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

1

## SITRANS P300 for gauge and absolute pressure

### SITRANS P300 for gauge and absolute pressure

#### Design (version with front-flush diaphragm)

Weight (without options)	approx. 1 ... 13 kg (2.2 ... 29 lb)
Enclosure material	Stainless steel, mat. no. 1.4301/304
Material of parts in contact with the medium	
• Process connection	Stainless steel, mat. no. 1.4404/316L
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L
• Measuring cell filling	<ul style="list-style-type: none"> <li>• Silicone oil</li> <li>• Inert filling liquid</li> <li>• FDA compliant fill fluid (Neobee oil)</li> </ul>
Process connection	<ul style="list-style-type: none"> <li>• Flanges as per EN and ASME</li> <li>• F&amp;B and pharmaceutical flanges</li> </ul>
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 $\mu\text{-inch}$ ))

<b>Power supply <math>U_H</math></b>	<b>HART</b>	<b>PROFIBUS PA/FOUNDATION Fieldbus</b>
Terminal voltage on transmitter	10.5 ... 42 V DC for intrinsically safe operation: 10.5 ... 30 V DC	
Power supply	-	Supplied through bus
Separate supply voltage	-	Not necessary
Bus voltage		
• Without Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Max. basic current	-	12.5 mA
• Start-up current $\leq$ basic current	-	Yes
• Max. fault current in the event of a fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

**SITRANS P300 for gauge and absolute pressure****Certificates and approvals**

Classification according to PED 2014/68/EU

Water, waste water

Explosion protection

Intrinsic safety "i"

- Marking
- Permissible ambient temperature
  - Temperature class T4
  - Temperature class T5
  - Temperature class T6
- Connection

• Effective inner capacitance:

• Effective internal inductance:

Explosion protection to FM for USA and Canada (cFM<sub>US</sub>)

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

- Identification (DIP) or (IS)

Dust explosion protection for zone 20/21/22

• Marking

• Permissible ambient temperature

- Temperature class T4
- Temperature class T5
- Temperature class T6

• Connection

• Effective inner capacitance:

• Effective internal inductance:

Type of protection Ex nA/nL/ic (Zone 2)

• Marking

• Permissible ambient temperature

- Temperature class T4
- Temperature class T5
- Temperature class T6

• Ex nA/nL connection

• Ex ic connection

• Effective inner capacitance:

• Effective internal inductance:

**HART**

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

Pending

PTB 05 ATEX 2048

II1/2 G Ex ia IIC/IIB T4/T5/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F)

-40 ... +70 °C (-40 ... +158 °F)

-40 ... +60 °C (-40 ... +140 °F)

To certified intrinsically-safe circuits with peak values:

 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  
 $P_i = 750 \text{ mW}$ ,  $R_i = 300 \Omega$  $C_i = 6 \text{ nF}$  $L_i = 0.4 \text{ mH}$ **PROFIBUS PA/ FOUNDATION Fieldbus**

To certified intrinsically-safe circuits with peak values:

FISCO supply unit: $U_i = 17.5 \text{ V}$ ,  $I_i = 380 \text{ mA}$ ,  $P_i = 5.32 \text{ W}$ Linear barrier: $U_i = 24 \text{ V}$ ,  $I_i = 250 \text{ mA}$ ,  $P_i = 1.2 \text{ W}$  $C_i = 1.1 \text{ nF}$  $L_i \leq 7 \mu\text{H}$ 

Certificate of Compliance 3025099

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 3025099C

CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC 4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

PTB 05 ATEX 2048

II 1 D Ex ia IIC T120 °C Da

II 1/2 D Ex ia IIC T120 °C Da/Db

II 2 D Ex ib IIC T120 °C Db

-40 ... +85 °C (-40 ... +185 °F)  
(in the case of mineral glass windows only -20 ... +85 °C (-4 ... +185 °F))-40 ... +70 °C (-40 ... +158 °F)  
(in the case of mineral glass windows only -20 ... +70 °C (-4 ... +158 °F))-40 ... +60 °C (-40 ... +140 °F)  
(in the case of mineral glass windows only -20 ... +60 °C (-4 ... +140 °F))To certified intrinsically-safe circuits with peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 100 \text{ mA}$ ,  $P_i = 750 \text{ mW}$  $C_i = 6 \text{ nF}$  $L_i = 0.4 \mu\text{H}$ To certified intrinsically-safe circuits with peak values:  
 $U_i = 24 \text{ V}$ ,  $I_i = 380 \text{ mA}$ ,  $P_i = 5.32 \text{ mW}$  $C_i = 5 \text{ nF}$  $L_i = 10 \mu\text{H}$ 

PTB 05 ATEX 2048

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

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

-40 ... +85 °C (-40 ... +185 °F)  
(in the case of mineral glass windows only -20 ... +85 °C (-4 ... +185 °F))-40 ... +70 °C (-40 ... +158 °F)  
(in the case of mineral glass windows only -20 ... +70 °C (-4 ... +158 °F))-40 ... +60 °C (-40 ... +140 °F)  
(in the case of mineral glass windows only -20 ... +60 °C (-4 ... +140 °F))To certified intrinsically-safe circuits with peak values:  $U_m = 45 \text{ V}$ To certified intrinsically-safe circuits with peak values:  $U_i = 45 \text{ V}$  $C_i = 6 \text{ nF}$  $L_i = 0.4 \text{ mH}$ To certified intrinsically-safe circuits with peak values:  $U_m = 32 \text{ V}$ To certified intrinsically-safe circuits with peak values:  $U_i = 32 \text{ V}$  $C_i = 5 \text{ nF}$  $L_i = 20 \mu\text{H}$

# Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

1

## SITRANS P300 for gauge and absolute pressure

<b>HART Communication</b>		<b>FOUNDATION Fieldbus communication</b>
HART communication	230 ... 1100 Ω	Function blocks
Protocol	HART Version 5.x	
Software for computer	SIMATIC PDM	3 function blocks analog input, 1 function block PID
<b>PROFIBUS PA communication</b>		
Simultaneous communication with master class 2 (max.)	4	
The address can be set using	Configuration tool or local operation (standard setting Address 126)	
Cyclic data usage		
• Output byte	5 (one measured value) or 10 (two measured values)	Yes, linearly rising or falling characteristic
• Input byte	0.1 or 2 (totalizer mode and reset function for dosing)	0 ... 100 s
• Internal preprocessing		Output/input (can be locked within the device with a bridge)
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	parameterizable (last good value, substitute value, incorrect value)
Function blocks	2	
• Analog input		
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	Yes, one upper and lower warning limit and one alarm limit respectively
- Electrical damping adjustable	0 ... 100 s	
- Simulation function	Input /Output	
- Failure function	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	
- 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.
<b>SITRANS P300 pressure transmitters for relative and absolute pressure</b> , single-chamber measuring enclosure, rating plate inscription in English			<b>SITRANS P300 pressure transmitters for relative and absolute pressure</b> , single-chamber measuring enclosure, rating plate inscription in English	
4 ... 20 mA/HART		7MF8023 -	4 ... 20 mA/HART	7MF8023 -
PROFIBUS PA		7MF8024 -	PROFIBUS PA	7MF8024 -
FOUNDATION Fieldbus (FF)		7MF8025 -	FOUNDATION Fieldbus (FF)	7MF8025 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>		<b>Display</b>	
Silicone oil	normal	1	• Without display, with keys, closed lid	1
Inert liquid	Cleanliness level 2 to DIN 25410	3	• With display and keys, closed lid <sup>11)</sup>	2
<b>Measuring span (min. ... max.)</b>			• With display and keys, lid with polycarbonate disc	4
8.3 ... 250 mbar	(0.12 ... 3.63 psi)	A	• (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units) <sup>11)</sup>	
0.01 ... 1 bar	(0.145 ... 14.5 psi)	B	• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc <sup>11)</sup>	5
0.04 ... 4 bar	(0.58 ... 58 psi)	C	• With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS and FOUNDATION Fieldbus equipment: pressure units) <sup>11)</sup>	6
0.16 ... 16 bar	(2.32 ... 232 psi)	D	• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane <sup>11)</sup>	7
0.63 ... 63 bar	(9.14 ... 914 psi)	E		
1.6 ... 160 bar	(23.2 ... 2320 psi)	F		
4 ... 400 bar	(58 ... 5802 psi)	G		
8.34 ... 250 mbar a	(0.13 ... 3.63 psi a)	Q		
43.34 ... 1300 mbar a	(0.63 ... 18.86 psi a)	S		
0.17 ... 5 bar a	(2.43 ... 72.5 psi a)	T		
1 ... 30 bar a	(14.6 ... 435 psi a)	U		
<b>Wetted parts materials</b>			<b>Power supply units</b> see Chap. 7 "Supplementary Components".	
Seal diaphragm	Measuring cell		A quick-start guide is included in the scope of delivery of the device.	
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" <b>(recommended version)</b>		Y		
<b>Process connection</b>				
• Connection shank G1/2B to EN 837-1		0	1) 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.	
• Female thread 1/2-14 NPT		1	2) 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.	
• Stainless steel oval flange with process connection (Oval flange has no female thread) <sup>6)</sup>		2	3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF802-.-Y-... and 7MF4900-1-...B	
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		3	4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.	
- Mounting thread M10 to DIN 19213		4	5) Remote seal for direct mounting only available in combination with process connection 1/2-14 NPT.	
- Mounting thread M12 to DIN 19213		5	6) 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)	
• Male thread M20 x 1.5		6	7) Only available together with electrical connection option A	
• Male thread 1/2 -14 NPT		4	8) Only available together with electrical connection options B, C or G.	
<b>Non-wetted parts materials</b>		1	9) Only together with HART electronics.	
• Stainless steel, deep-drawn and electrolytically polished		A	10) Without cable gland.	
<b>Version</b>		B	11) Display cannot be turned.	
• Standard versions		C		
<b>Explosion protection</b>		E		
• None		M		
• With ATEX, Type of protection:		A		
- "Intrinsic safety (Ex ia)"		B		
• Zone 20/21/22 <sup>7)</sup>		C		
• Ex nA/nL (Zone 2) <sup>8)</sup>		E		
• with FM "intrinsic safety" (cFM <sub>US</sub> )		M		
<b>Electrical connection / cable entry</b>		A		
• Screwed gland M20x1.5 (polyamide) <sup>9)</sup>		B		
• Screwed gland M20x1.5 (metal)		C		
• Screwed gland M20x1.5 (stainless steel)		G		
• Device plug M12 (stainless steel), without cable socket)		H		
• Screwed gland 1/2-14 NPT metal thread <sup>10)</sup>		J		
• Screwed gland 1/2-14 NPT stainless steel thread				

# Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

1

## SITRANS P300 for gauge and absolute pressure

Selection and Ordering data		Article No.	Selection and Ordering data	Article No.
<b>SITRANS P300 pressure transmitters for relative and absolute pressure with front-flush membrane</b> , single-chamber measuring enclosure, rating plate inscription in English			<b>SITRANS P300 pressure transmitters for relative and absolute pressure with front-flush membrane</b> , single-chamber measuring enclosure, rating plate inscription in English	
<b>4 ... 20 mA/HART</b>		7MF8123 -	<b>4 ... 20 mA/HART</b>	7MF8123 -
<b>PROFIBUS PA</b>		7MF8124 -	<b>PROFIBUS PA</b>	7MF8124 -
<b>FOUNDATION Fieldbus (FF)</b>		7MF8125 -	<b>FOUNDATION Fieldbus (FF)</b>	7MF8125 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>		<b>Display</b>	
Silicone oil	normal	1	• Without display, with keys, closed lid	1
Inert liquid		3	• With display and keys, closed lid <sup>7)</sup>	2
FDA compliant fill fluid		4	• With display and keys, lid with polycarbonate disc (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units) <sup>7)</sup>	4
• Neobee oil	normal		• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc <sup>7)</sup>	5
<b>Measuring span (min. ... max.)</b>			• With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units) <sup>7)</sup>	6
0.01 ... 1 bar	(0.15 ... 14.5 psi)	B	• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane <sup>7)</sup>	7
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 <sup>1)</sup>	(0.63 ... 18.86 psi a <sup>1)</sup> )	S		
0.17 ... 5 bar a <sup>1)</sup>	(2.43 ... 72.5 psi a <sup>1)</sup> )	T		
1 ... 30 bar a <sup>1)</sup>	(14.6 ... 435 psi a <sup>1)</sup> )	U		
<b>Wetted parts materials</b>				
Seal diaphragm	Measuring cell			
Stainless steel	Stainless steel	A	<b>Power supply units</b> see Chap. 7 "Supplementary Components"	
Hastelloy <sup>2)</sup>	Stainless steel	B	A quick-start guide is included in the scope of delivery of the device.	
<b>Process connection</b>				
• Flange version with Order code M.., N.., R.. or Q.. (see "Further designs")		7	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.	
<b>Non-wetted parts materials</b>		4	2) Only available for flanges with options M.., N.. and Q..	
• Stainless steel, deep-drawn and electrolytically polished		1	3) Only together with electrical connection option A.	
<b>Version</b>			4) Only available together with electrical connection options B, C or G.	
• Standard versions		A	5) Only together with HART electronics.	
<b>Explosion protection</b>		B	6) Without cable gland.	
• None		C	7) Display cannot be turned.	
• With ATEX, Type of protection:		E		
- "Intrinsic safety (Ex ia)"		M		
• Zone 20/21/22 <sup>3)</sup>		A		
• Ex nA/nL (Zone 2) <sup>4)</sup>		B		
• with FM "intrinsic safety" (cFM <sub>us</sub> )		C		
<b>Electrical connection / cable entry</b>		G		
• Screwed gland M20x1.5 (polyamide) <sup>5)</sup>		H		
• Screwed gland M20x1.5 (metal)		J		
• Screwed gland M20x1.5 (stainless steel)				
• Device plug M12 (stainless steel), without cable socket)				
• Screwed gland 1/2-14 NPT metal thread <sup>6)</sup>				
• Screwed gland 1/2-14 NPT stainless steel thread <sup>6)</sup>				

**SITRANS P300 for gauge and absolute pressure**

Selection and Ordering data		Order code			Selection and Ordering data		Order code		
Further designs		HART	PA	FF	Further designs		HART	PA	FF
<b>Pressure transmitter with mounting bracket (2 shackles, 4 nuts, 4 U-plates, 1 angle) made of:</b> made completely of stainless steel, for wall or pipe mounting	A02	✓	✓	✓	<b>Sanitary process connection according DIN 11851 (Dairy connection with slotted union nut)</b>				
<b>Cable socket for device plugs M12</b> • Stainless steel	A51	✓	✓	✓	• DN 50, PN 25	N04	✓	✓	✓
<b>Rating plate inscription</b> (instead of English) • German	B10	✓	✓	✓	• DN 80, PN 25	N06	✓	✓	✓
• French	B12	✓	✓	✓					
• Spanish	B13	✓	✓	✓					
• Italian	B14	✓	✓	✓	<b>Tri-Clamp connection according DIN 32676/ISO 2852</b> 3A compliant <sup>6)</sup>				
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓	✓	• DN 50/2", PN 16	N14	✓	✓	✓
<b>Quality test certificate, 5-point factory calibration (IEC 60770-2)<sup>1)</sup></b>	C11	✓	✓	✓	• DN 65/2.5", PN 10	N15	✓	✓	✓
<b>Inspection certificate<sup>2)</sup></b> Acc. to EN 10204-3.1	C12	✓	✓	✓	• Clamp 2" ISO 2852 PN 16	N22	✓	✓	✓
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	✓	• Clamp 3" ISO 2852 PN 16	N23	✓	✓	✓
<b>Degree of protection IP65/IP68</b> (only for M20x1.5 and 1/2-14 NPT)	D12	✓	✓	✓					
<b>Degree of protection IP6k9k</b> (only for M20x1.5)	D46	✓	✓	✓	<b>Varivent connection</b> 3A and EHEDG compliant <sup>6)</sup>				
<b>CRN approval Canada</b> (Canadian Registration Number)	E22	✓	✓	✓	• Type N = 68 for Varivent enclosure	N28	✓	✓	✓
<b>Export approval Korea</b>	E11	✓	✓	✓	DN 40 ... 125 and 1 1/2" ... 6", PN 40				
<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	E80	✓	✓	✓	<b>Temperature decoupler up to 200 °C<sup>7)</sup></b> for front-flush diaphragm version	P00	✓	✓	✓
<b>Ex Approval Ex ia(ib) NEPSI</b>	E55	✓	✓	✓	<b>Sanitary process connection to DRD</b>				
<b>Only for SITRANS P300 with front-flush diaphragm (7MF81...)</b>					• DN 50, PN 40	M32	✓	✓	✓
<b>Flange to EN 1092-1, Form B1</b> • DN 25, PN 40 <sup>3)</sup> • DN 40, PN 40 • DN 40, PN 100 • DN 50, PN 16 • DN 50, PN 40 • DN 80, PN 16 • DN 80, PN 40	M11	✓	✓	✓					
	M13	✓	✓	✓	<b>SMS threaded socket</b>				
	M23	✓	✓	✓	• 2" • 2 1/2" • 3"	M73	✓	✓	✓
	M04	✓	✓	✓		M74	✓	✓	✓
	M14	✓	✓	✓		M75	✓	✓	✓
	M06	✓	✓	✓	<b>Sanitary process connection to NEUMO Bio-Connect screw connection</b> 3A and EHEDG compliant <sup>6)</sup>				
	M16	✓	✓	✓	• DN 50, PN 16	Q05	✓	✓	✓
<b>Flanges to ASME B16.5</b> • 1", class 150 <sup>4)</sup> • 1 1/2", class 150 • 2", class 150 • 3", class 150 • 4", class 150 • 1", class 300 <sup>4)</sup> • 1 1/2", class 300 • 2", class 300 • 3", class 300 • 4", class 300	M40	✓	✓	✓	• DN 65, PN 16	Q06	✓	✓	✓
	M41	✓	✓	✓	• DN 80, PN 16	Q07	✓	✓	✓
	M42	✓	✓	✓	• DN 100, PN 16	Q08	✓	✓	✓
	M43	✓	✓	✓	• DN 2", PN 16	Q13	✓	✓	✓
	M44	✓	✓	✓	• DN 2 1/2", PN 16	Q14	✓	✓	✓
	M45	✓	✓	✓	• DN 3", PN 16	Q15	✓	✓	✓
	M46	✓	✓	✓	• DN 4", PN 16	Q16	✓	✓	✓
	M47	✓	✓	✓	<b>Sanitary process connection to NEUMO Bio-Connect S flange connection</b>				
	M48	✓	✓	✓	• DN 2", PN 16	Q72	✓	✓	✓
	M49	✓	✓	✓					
<b>Threaded connector to DIN 3852-2, form A, thread to ISO 228</b> • G 3/4"-A, front-flush <sup>4)</sup> • G 1"-A, front-flush <sup>4)</sup> • G 2"-A, front-flush	R01	✓	✓	✓					
	R02	✓	✓	✓					
	R04	✓	✓	✓					
<b>Tank connection<sup>5)</sup></b> Sealing is included in delivery • TG 52/50, PN 40 • TG 52/150, PN 40	R10	✓	✓	✓					
	R11	✓	✓	✓					

# Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

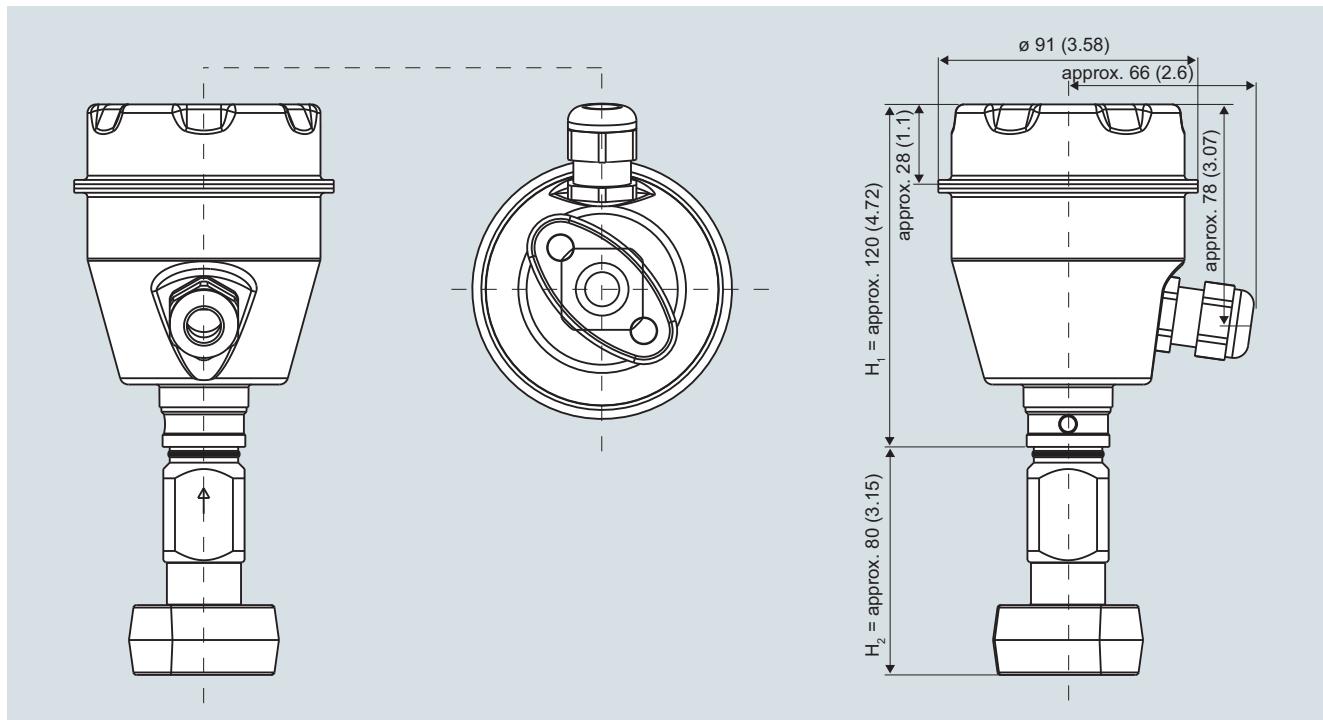
1

## SITRANS P300 for gauge and absolute pressure

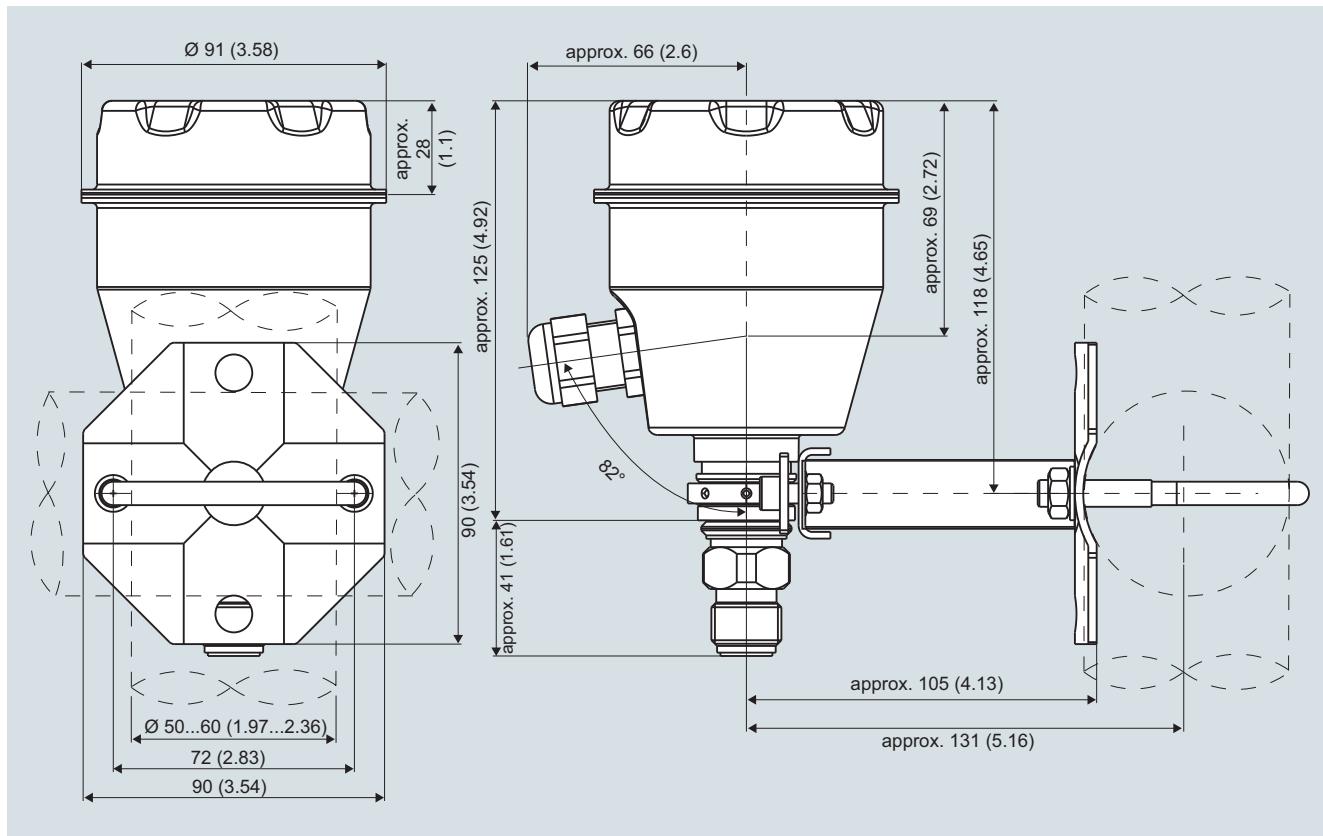
Selection and Ordering data		Order code			Selection and Ordering data		Order code		
Further designs		HART	PA	FF	Additional data		HART	PA	FF
Add "-Z" to Article No. and specify Order code(s).					Please add "-Z" to Article No. and specify Order code(s) and plain text.				
<b>Aseptic threaded socket to DIN 11864-1 Form A</b>					<b>Measuring range to be set</b>	Y01	✓	✓ <sup>8)</sup>	
3A compliant <sup>6)</sup>					Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi				
• DN 50, PN 25	N33	✓	✓	✓	<b>Stainless steel tag plate and entry in device variable (measuring point description)</b>	Y15	✓	✓	✓
• DN 65, PN 25	N34	✓	✓	✓	Max. 16 characters, specify in plain text: Y15: .....				
• DN 80, PN 25	N35	✓	✓	✓	<b>Measuring point text (entry in device variable)</b>	Y16	✓	✓	✓
• DN 100, PN 25	N36	✓	✓	✓	Max. 27 characters, specify in plain text: Y16: .....				
<b>Aseptic flange with notch to DIN 11864-2 Form A</b>					<b>Entry of HART TAG</b>	Y17	✓		
3A compliant <sup>6)</sup>					Max. 8 characters, specify in plain text: Y17: .....				
• DN 50, PN 16	N43	✓	✓	✓	<b>Setting of the display in pressure units</b>	Y21	✓	✓	✓
• DN 65, PN 16	N44	✓	✓	✓	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 <sub>2</sub> O <sup>*</sup> , inH <sub>2</sub> O <sup>*</sup> , ftH <sub>2</sub> O <sup>*</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % *) ref. temperature 20 °C				
• DN 80, PN 16	N45	✓	✓	✓	<b>Setting of the display in non-pressure units<sup>9)</sup></b>	Y22 + Y01	✓		
• DN 100, PN 16	N46	✓	✓	✓	Specify in plain text: Y22: .... up to .... l, m <sup>3</sup> , m, USg, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)				
<b>Aseptic flange with groove to DIN 11864-2 Form A</b>					<b>Preset bus address</b>	Y25	✓	✓	
3A compliant <sup>6)</sup>					(possible between 1 ... 126)				
• DN 50, PN 25	N43 + P11	✓	✓	✓	Specify in plain text: Y25: .....				
• DN 65, PN 16	N44 + P11	✓	✓	✓	Factory mounting of valve manifolds, see accessories.				
• DN 80, PN 16	N45 + P11	✓	✓	✓	Only Y01, Y15, Y16, Y17, Y21, Y22 and Y25 can be factory preset				
• DN 100, PN 16	N46 + P11	✓	✓	✓	✓ = available				
<b>Aseptic clamp with groove to DIN 11864-3 Form A</b>					<b>Ordering example</b>				
3A compliant <sup>6)</sup>					Item line: 7MF8023-1DB24-1AB7-Z				
• DN 50, PN 25	N53	✓	✓	✓	B line: A02 + Y01 + Y21				
• DN 65, PN 25	N54	✓	✓	✓	C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)				
• DN 80, PN 16	N55	✓	✓	✓	C line: Y21: bar (psi)				
• DN 100, PN 16	N56	✓	✓	✓					

- 1) 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.
- 2) 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.
- 3) Special seal in Viton included in the scope of delivery (FKM; temperature range -20 ... +200 °C (-4 ... +392 °F))
- 4) Cannot be combined with Order code P00. Can only be ordered with silicone oil measuring cell filling.
- 5) The weldable socket can be ordered under accessories.
- 6) 3A compliance ensured only when 3A compliant sealing rings are used.
- 7) Conformity according to 3A and EHEDG. The maximum permissible temperatures of the medium depend on the respective cell fillings (see medium conditions).
- 8) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.
- 9) Preset values can only be changed over SIMATIC PDM.

**Dimensional drawings**



SITRANS P300, with oval flange, dimensions in mm (inch)



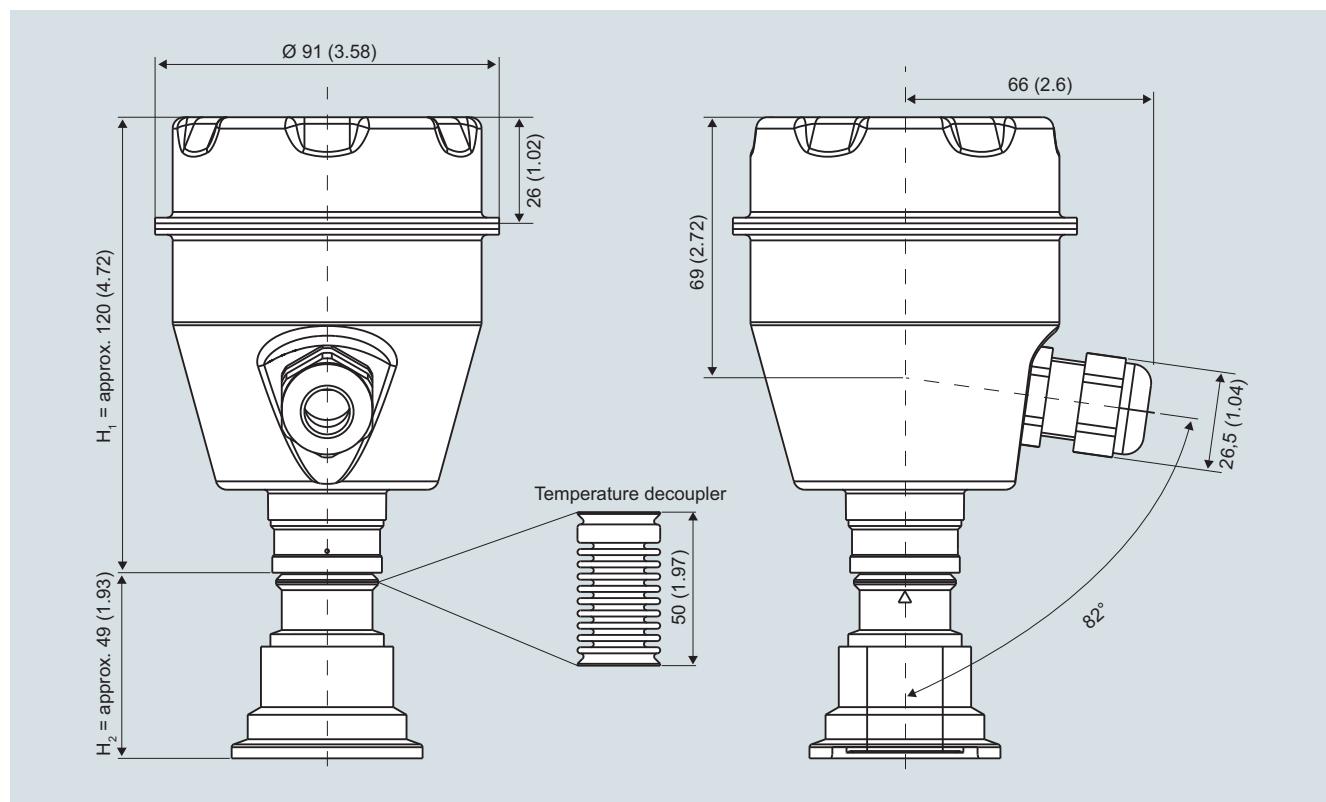
SITRANS P300, process connection M20 x 1.5, with mounted mounting bracket, dimensions in mm (inch)

# Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

1

## SITRANS P300 for gauge and absolute pressure



SITRANS P300, front-flush, dimensions in mm (inch)

The diagram shows a SITRANS P300 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

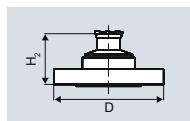
Only the height  $H_2$  is indicated in the dimensions of the flanges.

## SITRANS P300 for gauge and absolute pressure

## Flanges according to EN and ASME

## Flange according to EN

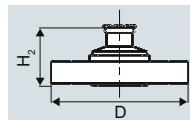
## EN 1092-1



Order code	DN	PN	ØD	H <sub>2</sub>
<b>M11</b>	25	40	115 mm (4.5")	Approx. 52 mm (2")
<b>M13</b>	40	40	150 mm (5.9")	
<b>M23</b>	40	100	170 mm (6.7")	
<b>M04</b>	50	16	165 mm (6.5")	
<b>M14</b>	50	40	165 mm (6.5")	
<b>M06</b>	80	16	200 mm (7.9")	
<b>M16</b>	80	40	200 mm (7.9")	

## Flanges according to ASME

## ASME B16.5

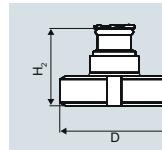


Order code	DN	PN	ØD	H <sub>2</sub>
<b>M40</b>	1"	150	110 mm (4.3")	Approx. 52 mm (2")
<b>M41</b>	1½"	150	130 mm (5.1")	
<b>M42</b>	2"	150	150 mm (5.9")	
<b>M43</b>	3"	150	190 mm (7.5")	
<b>M44</b>	4"	150	230 mm (9.1")	
<b>M46</b>	1½"	300	155 mm (6.1")	
<b>M47</b>	2"	300	165 mm (6.5")	
<b>M48</b>	3"	300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

## NuG and pharmaceutical connections

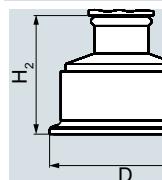
## Connections to DIN

## DIN 11851 (milk pipe union with slotted union nut)



Order code	DN	PN	ØD	H <sub>2</sub>
<b>N04</b>	50	25	92 mm (3.6")	Approx. 52 mm (2")
<b>N06</b>	80	25	127 mm (5.0")	

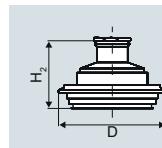
## Tri-Clamp nach DIN 32676



Order code	DN	PN	ØD	H <sub>2</sub>
<b>N14</b>	50	16	64 mm (2.5")	Approx. 52 mm (2")
<b>N15</b>	65	10	91 mm (3.6")	

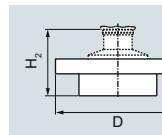
## Other connections

## Varivent connection



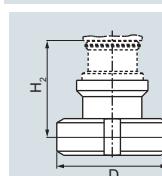
Order code	DN	PN	ØD	H <sub>2</sub>
<b>N28</b>	40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

## Sanitary process connection to DRD



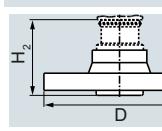
Order code	DN	PN	ØD	H <sub>2</sub>
<b>M32</b>	50	40	105 mm (4.1")	Approx. 52 mm (2")

## Sanitary process screw connection to NEUMO Bio-Connect



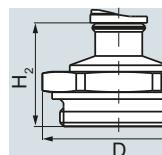
Order code	DN	PN	ØD	H <sub>2</sub>
<b>Q05</b>	50	16	82 mm (3.2")	Approx. 52 mm (2")
<b>Q06</b>	65	16	105 mm (4.1")	
<b>Q07</b>	80	16	115 mm (4.5")	
<b>Q08</b>	100	16	145 mm (5.7")	
<b>Q13</b>	2"	16	82 mm (3.2")	
<b>Q14</b>	2½"	16	105 mm (4.1")	
<b>Q15</b>	3"	16	105 mm (4.1")	
<b>Q16</b>	4"	16	145 mm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

## Sanitary process connection to NEUMO Bio-Connect S flange connection



Order code	DN	PN	ØD	H <sub>2</sub>
<b>Q72</b>	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 <sub>2</sub>
<b>R01</b>	¾"	60	37 mm (1.5")	Approx. 45 mm (1.8")
<b>R02</b>	1"	60	48 mm (1.9")	Approx. 47 mm (1.9")
<b>R04</b>	2"	60	78 mm (3.1")	Approx. 52 mm (2")

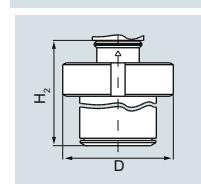
# Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

1

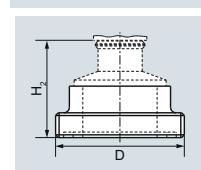
## SITRANS P300 for gauge and absolute pressure

### Tank connection TG 52/50 and TG52/150



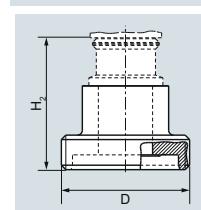
Order code	DN	PN	ØD	H <sub>2</sub>
R10	25	40	63 mm (2.5")	Approx. 63 mm (2.5")
R11	25	40	63 mm (2.5")	Approx. 170 mm (6.7")

### SMS threaded socket



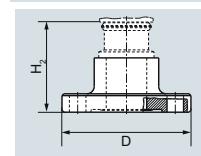
Order code	DN	PN	ØD	H <sub>2</sub>
M73	2"	25	70 x 1/6 mm	Approx. 52 mm (2")
M74	2 1/2"	25	85 x 1/6 mm	
M75	3"	25	98 x 1/6 mm	

### Aseptic threaded socket to DIN 11864-1 Form A



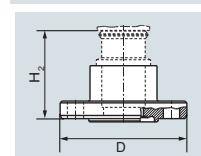
Order code	DN	PN	ØD	H <sub>2</sub>
N33	50	25	78 x 1/6"	Approx. 52 mm (2")
N34	65	25	95 x 1/6"	
N35	80	25	110 x 1/4"	
N36	100	25	130 x 1/4"	

### Aseptic flange with notch to DIN 11864-2 Form A



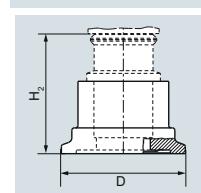
Order code	DN	PN	ØD	H <sub>2</sub>
N43	50	16	94	Approx. 52 mm (2")
N44	65	16	113	
N45	80	16	133	
N46	100	16	159	

### Aseptic flange with groove to DIN 11864-2 Form A



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

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
<i>Spare parts / Accessories</i>		<i>Documentation</i>	
<b>Mounting bracket and fastening parts kit</b> made of stainless steel	<b>7MF8997-1AA</b>	The entire documentation is available for download free-of-charge in various languages at: <a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a>	
<b>Lid without window</b> gasket not included	<b>7MF8997-1BA</b>	Compact operating instructions	
<b>Lid with glass window</b> gasket not included	<b>7MF8997-1BD</b>	• English, German, Spanish, French, Italian, Dutch	<b>A5E03434657</b>
<b>NBR enclosure sealing</b>	<b>7MF8997-1BG</b>	<b>Certificates (order only via SAP)</b> instead of Internet download	
<b>Measuring point label</b> unlabeled	<b>7MF8997-1CA</b>	• hard copy (to order)	<b>A5E03252406</b>
<b>Cable gland</b> • metal	<b>7MF8997-1EA</b>	• on DVD (to order)	<b>A5E03252407</b>
• plastic (blue)	<b>7MF8997-1EB</b>		
<b>Weldable sockets for PMC connection</b> • PMC Style Standard: Thread 1½" • PMC Style Minibolt: front-flush 1"	<b>7MF4997-2HA</b> <b>7MF4997-2HB</b>	<b>HART modem</b> with USB interface	<b>7MF4997-1DB</b>
<b>Gaskets for PMC connection</b> (packing unit = 5 units)	<b>7MF4997-2HC</b>	Power supply units see Chap. 7 "Supplementary Components".	
• PTFE seal for PMC Style Standard: Thread 1½"			
• Gasket made of Viton for PMC Style Minibolt: front-flush 1"	<b>7MF4997-2HD</b>		
<b>Weldable socket for TG 52/50 and TG 52/150 connection</b> • TG 52/50 connection • TG 52/150 connection	<b>7MF4997-2HE</b> <b>7MF4997-2HF</b>		
<b>Seals for TG 52/50 and TG 52/150 made of silicone</b>	<b>7MF4997-2HG</b>		
<b>Seals for flange connection with front-flush diaphragm</b> Material FKM (Viton); temperature range: -20 ... +200 °C (-4 ... +392 °F), 10 units • DN 25, PN 40 (M11) • 1", class 150 (M40)	<b>7MF4997-2HH</b> <b>7MF4997-2HK</b>		

# Pressure Measurement

Pressure transmitters  
for food, pharmaceuticals and biotechnology

1

## SITRANS P300 - Factory-mounting of valve manifolds on transmitters

### Overview

The SITRANS P300 transmitter for gauge and absolute 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

### 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 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 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

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



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

SITRANS P300 7MF802.-...1.-... **T03**

With process connection female thread 1/2-14 NPT in-sealed with PTFE sealing tape

Delivery including 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**

#### 7MF9011-4EA valve manifold on gauge and absolute pressure transmitters



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

SITRANS P300 7MF802.-...0.-... **T02**

with process connection collar G 1/2 A to EN 837-1 with gasket made of PTFE between valve manifold and transmitter

#### Alternative sealing material:

- Soft iron **A70**
- Stainless steel, Mat. No. 14571 **A71**
- copper **A72**

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

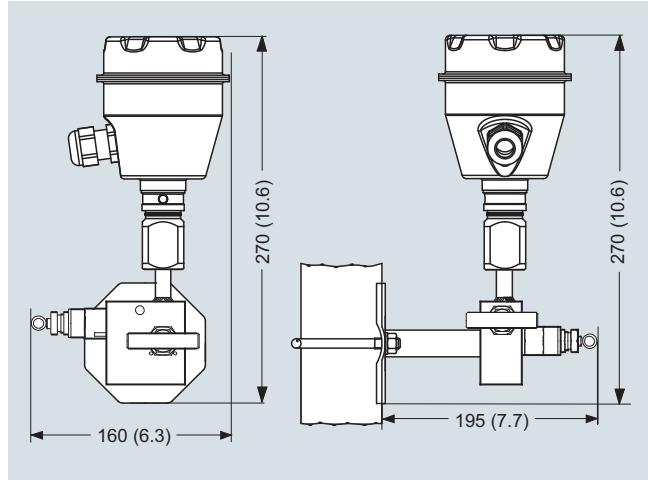
#### Further designs:

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**

**Dimensional drawings****Valve manifolds mounted on SITRANS P300**

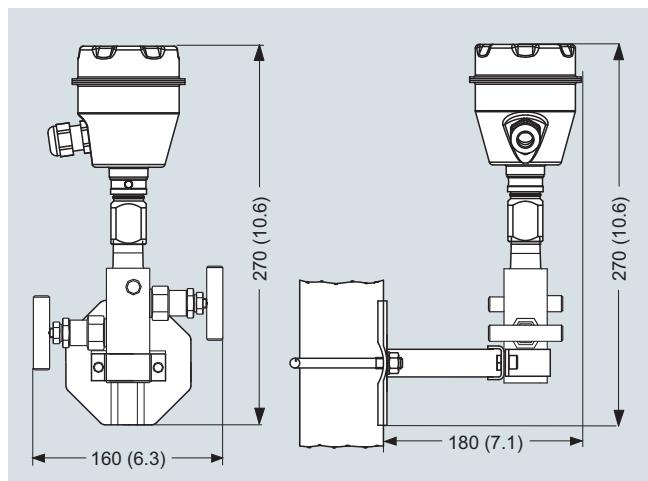
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters



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



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