

## Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

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#### 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 casing. 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 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 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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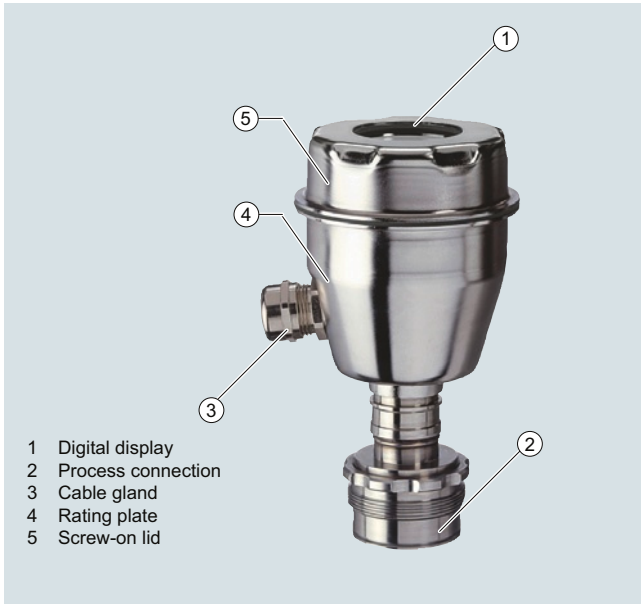
### SITRANS P300 for gauge and absolute pressure

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#### Design

The device comprises:

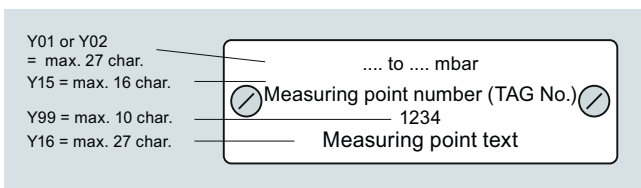
- Electronics
- Housing
- Measuring cell



Perspective view of SITRANS P300

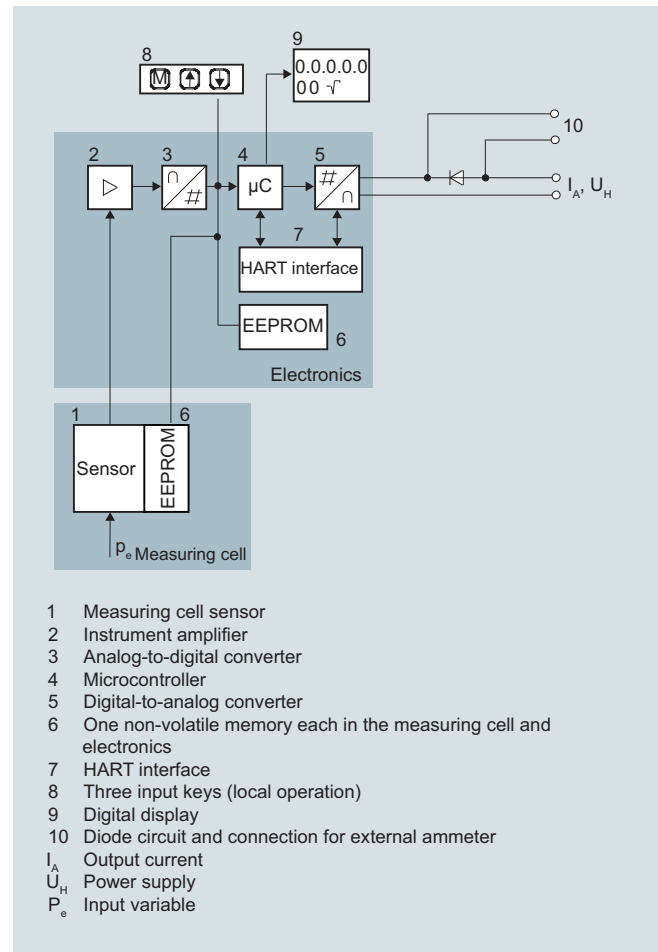
The housing has a screw-on lid (5) and, depending on the version, is with or without an inspection window. The electrical terminal housing, the buttons for operation of the device are located under this lid and, depending on the version, the display. The connections for the auxiliary power  $U_H$  and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

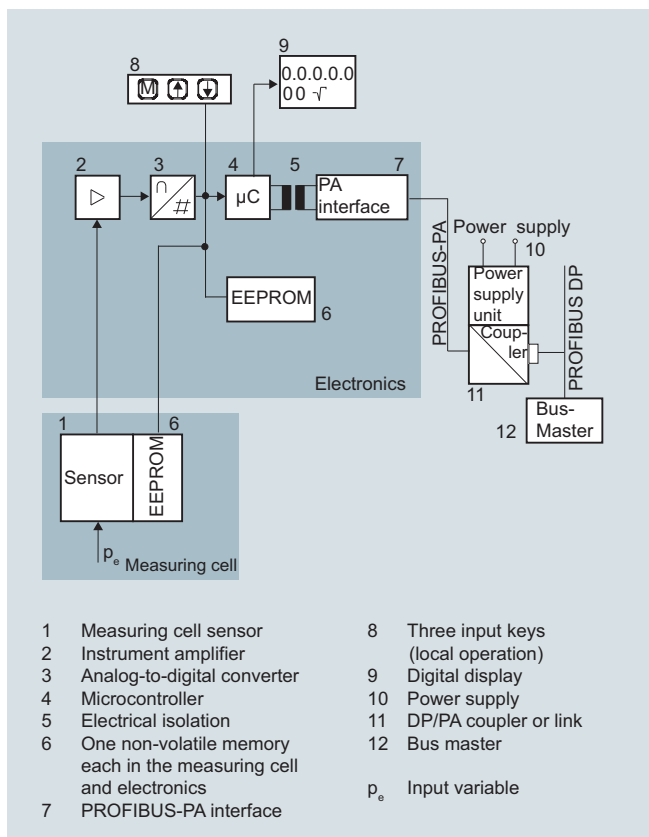
The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a display (9), you can use this to track mode settings and other messages. The basic mode settings can be changed with a computer via the HART modem (7).

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### SITRANS P300 for gauge and absolute pressure

#### Operation of electronics with PROFIBUS PA communication

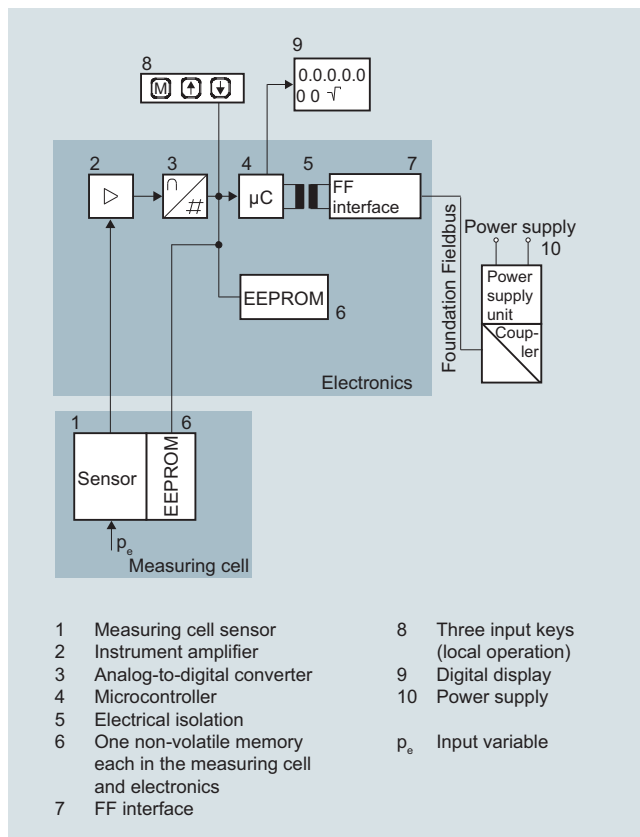


Function diagram of electronics

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 digitalized 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).

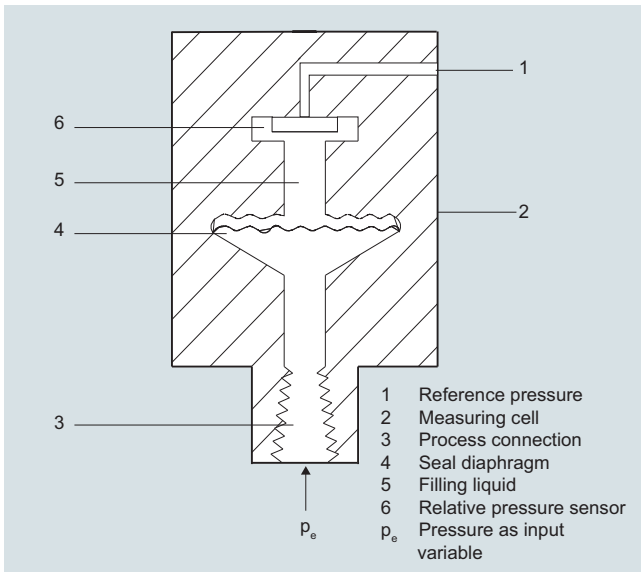
The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

#### Mode of operation of the measuring cells

The process connections available include the following:

- G $\frac{1}{2}$
- $\frac{1}{2}$ -14 NPT
- Flush-mounted diaphragm:
  - Flanges to EN
  - Flanges to ASME
  - NuG and pharmaceutical connections

## Measuring cell for gauge pressure

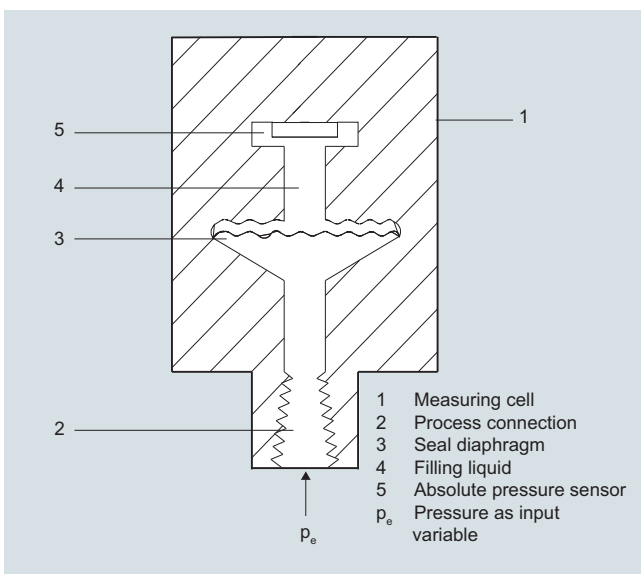


## Measuring cell for gauge pressure, function diagram

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

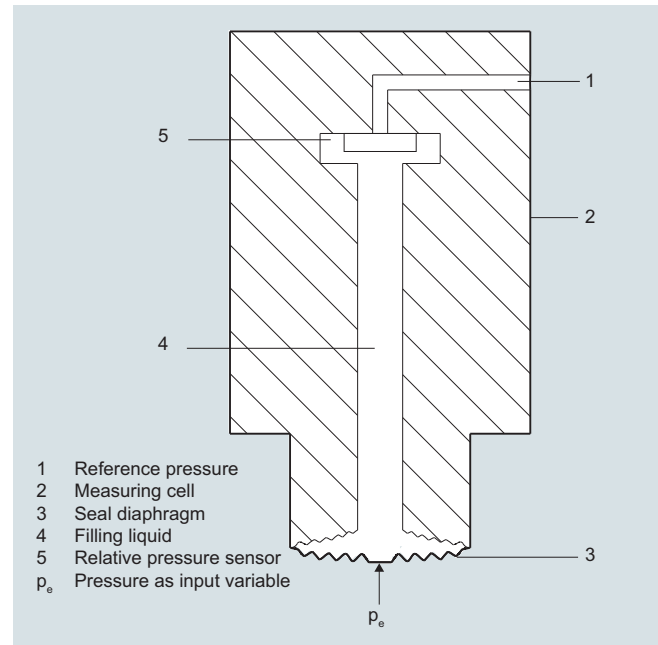
## Measuring cell for absolute pressure



## 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

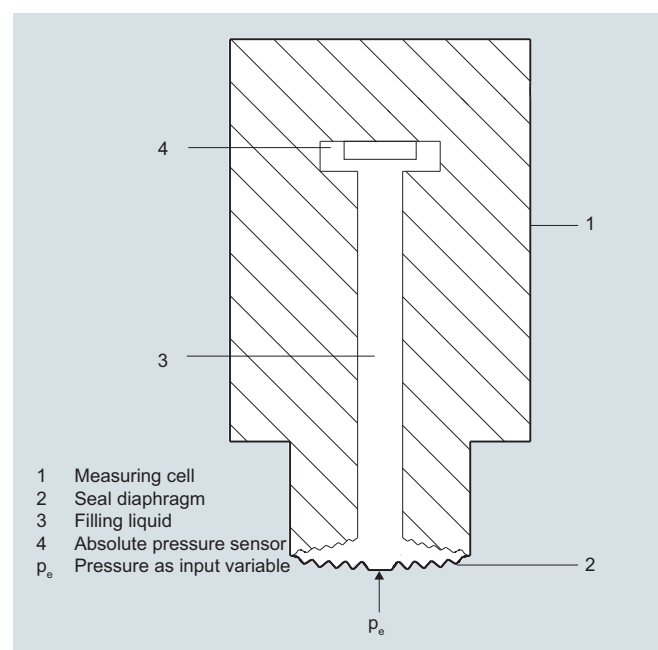


## Measuring cell for gauge pressure, front-flush diaphragm, function diagram

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 spans  $\leq 63$  bar ( $\leq 926.1$  psi) measure the input pressure compared to atmospheric, transmitters with 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

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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

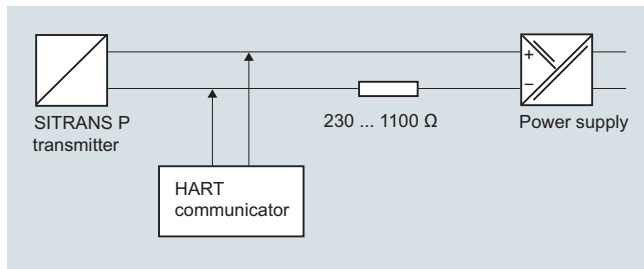
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

#### Parameterization using the input buttons (local operation)

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

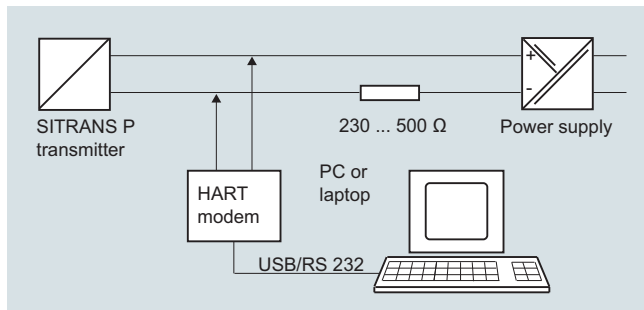
#### Parameterization using HART communication

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
Start of scale	x	x
Full-scale value	x	x
Electrical damping	x	x
Start-of-scale value without application of a pressure ("Blind setting")	x	x
Full-scale value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x <sup>1)</sup>
Type of dimension and actual dimension	x	x
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

<sup>1)</sup> 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

## 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.

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### Technical specifications

#### SITRANS P300 for gauge and absolute pressure

##### Gauge pressure input

Measured variable

Span (fully adjustable) or 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/process temperature)

HART	PROFIBUS PA/ FOUNDATION Fieldbus		
Span	Nominal measuring range	Max. operating pressure 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 2.5 MPa 3626 psi
4 ... 400 bar 0.4 ... 40 kPa 58 ... 5802 psi	400 bar 40 kPa 5802 psi	400 bar 40 MPa 5802 psi	600 bar 60 MPa 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. span  
(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 ° (140 °F) ambient temperature/process temperature)

##### Absolute pressure input

Measured variable

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

HART	PROFIBUS PA/ FOUNDATION Fieldbus		
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 inH <sub>2</sub> O a 0.13 ... 3.63 psi a	250 mbar a 25 kPa a 100 inH <sub>2</sub> O 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 inH <sub>2</sub> O a 0.63 ... 18.86 psi a	1300 mbar a 130 kPa a 525 inH <sub>2</sub> O	2.6 bar a 260 kPa a 37.7 psi a	10 bar a 1 MPa a 145 psi a
0.17 ... 5 bar 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

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<b>SITRANS P300 for gauge and absolute pressure</b>				
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 · (θ - 60 °C)/°C			
- for process temperature -20 °C < θ ≤ +60 °C (-4 °F < θ ≤ +140 °F)	3 kPa a + 2 kPa a · (θ - 60 °C)/°C			
- for process temperature 60 °C < θ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < θ ≤ +212 °F (max. 185 °F for meas. cell 435 psi))	0.44 psi a + 0.29 psi a · (θ - 140 °F)/°F			
Upper measuring limit	100 % of max. span (for oxygen measurement max. 100 bar/10 MPa/1450 psi und 60 °C (140 °F) ambient temperature/process temperature)			
Start of scale value	Between the measuring limits (fully adjustable)			
<b>Input of gauge pressure, with front-flush diaphragm</b>				
Measured variable	Gauge pressure, front-flush			
Span (continuously adjustable) or measuring range, max. operating pressure and max. test pressure	<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>		
	Span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	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
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 mbar a/10 kPa a/1.45 psi a			
Upper measuring limit	100% of max. span			
<b>Input of absolute pressure, with front-flush diaphragm</b>				
Measured variable	Absolute pressure, front-flush			
Span (continuously adjustable) or measuring range, max. operating pressure and max. test pressure	<b>HART</b>	<b>PROFIBUS PA/ FOUNDATION Fieldbus</b>		
	Span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	43 ... 1300 mbar a	1300 mbar a	2.6 bar a	10 bar a
	4.3 ... 130 kPa a	130 kPa a	260 kPa a	1 MPa a
	17 ... 525 inH <sub>2</sub> O a	525 inH <sub>2</sub> O a	37.7 psi a	145 psi a
	160 ... 5000 mbar a	5000 mbar a	10 bar a	30 bar a
	16 ... 500 kPa a	500 kPa a	1 MPa a	3 MPa a
	2.32 ... 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
	14.5 ... 435 psi a	435 psi a	653 psi a	1450 psi a
	Depending on the process connection, the span may differ from these values			
Lower measuring limit	0 mbar a/0 kPa a/0 psi a			
Upper measuring limit	100 % of max. 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)			



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#### Measuring accuracy for gauge pressure

Reference conditions

According to IEC 60770-1

- Increasing characteristic
- Start-of-scale 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)

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

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

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

- 1 bar/100 kPa/3.6 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

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

- 400 bar/40 MPa/5802 psi

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

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/3.6 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  
 400 bar/40 MPa/5802 psi

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

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

- 250 mbar/25 kPa/3.6 psi

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

- 1 bar/100 kPa/3.6 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

Effect of mounting position

$\leq 0.05$  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 the rated measuring range

**SITRANS P300 for gauge and absolute pressure****Measuring accuracy for absolute pressure**

Reference conditions

According to IEC 60770-1

- Increasing characteristic
- Start-of-scale 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) $r = \text{max. measuring span/set measuring span or nominal pressure range}$ 

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

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

 $\leq 0.05$  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 the rated measuring range**Measuring accuracy for gauge and absolute pressure,  
with front-flush diaphragm**

According to IEC 60770-1

Reference conditions

- Increasing characteristic
- Start-of-scale 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) $r = \text{max. measuring span/set measuring span or nom. pressure range}$ 

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

-  $r \leq 5$  $\leq 0.075 \%$ -  $5 < r \leq 100$  $\leq (0.005 \cdot r + 0.05) \%$ -  $r \leq 10$ 

-

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

-

 $\leq 0.4 \%$ Influence of ambient temperature  
(as percentage per 28 °C (50 °F)) $\leq (0.08 \cdot r + 0.16) \%$  $\leq (0.16 \cdot r + 0.24) \%$ Effect of process temperature  
(in pressure per temperature change)

- Temperature difference between process temperature and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

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 rated measuring range**Gauge pressure, with front-flush  
diaphragm****Absolute pressure, with front-flush  
diaphragm**

## Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

#### SITRANS P300 for gauge and absolute pressure

##### Rated 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 (FDA-compliant, with flush-mounted diaphragm)	-10 ... +85 °C (14 ... +185 °F)
• Measuring cell with inert liquid	-40 ... +85 °C (-40 ... +185 °F)
• Display readable	-30 ... +85 °C (-22 ... +185 °F)
• Storage temperature	-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	IP65, IP68
• according to NEMA 250	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	-40 ... +100 °C (-40 ... +212 °F)
• Measuring cell with silicone oil (FDA-compliant, with flush-mounted diaphragm)	-40 ... +150 °C (-40 ... +302 °F)
• Measuring cell with Neobee oil "Measuring cell with Neobee oil (FDA-compliant, with flush-mounted diaphragm)	-10 ... +150 °C (-14 ... +302 °F)
• Measuring cell with silicone oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)	-40 ... +200 °C (-40 ... +392 °F)
• Measuring cell with Neobee oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)	-10 ... +200 °C (14 ... +392 °F)
• Measuring cell with inert liquid	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with high-temperature oil (only for gauge pressure version with flush-mounted diaphragm)	-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	<ul style="list-style-type: none"> <li>• Silicone oil</li> <li>• Inert filling liquid</li> </ul>
Process connection	<ul style="list-style-type: none"> <li>• G½B to EN 837-1</li> <li>• Female thread ½-14 NPT</li> <li>• Oval flange PN 160 (MAWP 2320 psi) with fastening thread: <ul style="list-style-type: none"> <li>- 7/16 -20 UNF to IEC 61518/DIN EN 61518</li> <li>- M10 as per DIN 19213</li> </ul> </li> </ul>

**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	Stainless steel, mat. no. 1.4404/316L
<ul style="list-style-type: none"> <li>• Process connection</li> <li>• Seal diaphragm</li> <li>• Measuring cell filling</li> </ul>	<ul style="list-style-type: none"> <li>Stainless steel, mat. no. 1.4404/316L</li> <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 $\mu\text{-inch}$ ))

**Power supply  $U_H$** 

	<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 power supply	-	Not necessary
Bus voltage		
<ul style="list-style-type: none"> <li>• Without Ex</li> <li>• With intrinsically-safe operation</li> </ul>	-	9 ... 32 V
	-	9 ... 24 V
Current consumption		
<ul style="list-style-type: none"> <li>• Max. basic current</li> <li>• Start-up current <math>\leq</math> basic current</li> <li>• Max. fault current in the event of a fault</li> </ul>	-	12.5 mA
	-	Yes
	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

# Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

## SITRANS P300 for gauge and absolute pressure

### SITRANS P300 for gauge and absolute pressure

Certificates and approvals	HART	PROFIBUS PA/ FOUNDATION Fieldbus
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)	
Water, waste water	Pending	
<u>Explosion protection</u>		
Intrinsic safety "i"	PTB 05 ATEX 2048	
<ul style="list-style-type: none"> <li>• Marking</li> <li>• Permissible ambient temperature               <ul style="list-style-type: none"> <li>- Temperature class T4</li> <li>- Temperature class T5</li> <li>- Temperature class T6</li> </ul> </li> <li>• Connection</li> </ul>	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>FISCO supply unit:</u> $U_i = 17.5 \text{ V}$ , $I_i = 380 \text{ mA}$ , $P_i = 5.32 \text{ W}$  <u>Linear barrier:</u> $U_i = 24 \text{ V}$ , $I_i = 250 \text{ mA}$ , $P_i = 1.2 \text{ W}$ $C_i = 1.1 \text{ nF}$ $L_i \leq 7 \mu\text{H}$
<ul style="list-style-type: none"> <li>• Effective inner capacitance:</li> <li>• Effective internal inductance:</li> </ul> Explosion protection to FM for USA <u>and</u> Canada (cFM <sub>US</sub> )	$C_i = 6 \text{ nF}$ $L_i = 0.4 \text{ mH}$	
<ul style="list-style-type: none"> <li>• Identification (DIP) or (IS); (NI)</li> </ul>	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	
<ul style="list-style-type: none"> <li>• Identification (DIP) or (IS)</li> </ul>	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	
Dust explosion protection for zone 20/21/22	PTB 05 ATEX 2048	
<ul style="list-style-type: none"> <li>• Marking</li> <li>• Permissible ambient temperature               <ul style="list-style-type: none"> <li>- Temperature class T4</li> <li>- Temperature class T5</li> <li>- Temperature class T6</li> </ul> </li> <li>• Connection</li> </ul>	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))	
<ul style="list-style-type: none"> <li>• Effective inner capacitance:</li> <li>• Effective internal inductance:</li> </ul> Type of protection Ex nA/nL/ic (Zone 2)	$C_i = 6 \text{ nF}$ $L_i = 0.4 \mu\text{H}$	To certified intrinsically-safe circuits with peak values: $U_i = 24 \text{ V}$ , $I_i = 380 \text{ mA}$ , $P_i = 5.32 \text{ mW}$ $C_i = 5 \text{ nF}$ $L_i = 10 \mu\text{H}$
<ul style="list-style-type: none"> <li>• Marking</li> <li>• Permissible ambient temperature               <ul style="list-style-type: none"> <li>- Temperature class T4</li> <li>- Temperature class T5</li> <li>- Temperature class T6</li> </ul> </li> </ul>	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))	
<ul style="list-style-type: none"> <li>• Ex nA/nL connection</li> <li>• Ex ic connection</li> </ul>	To certified intrinsically-safe circuits with peak values: $U_m = 45 \text{ V}$  To certified intrinsically-safe circuits with peak values: $U_i = 45 \text{ V}$	To certified intrinsically-safe circuits with peak values: $U_m = 32 \text{ V}$  To certified intrinsically-safe circuits with peak values: $U_i = 32 \text{ V}$
<ul style="list-style-type: none"> <li>• Effective inner capacitance:</li> <li>• Effective internal inductance:</li> </ul>	$C_i = 6 \text{ nF}$ $L_i = 0.4 \text{ mH}$	$C_i = 5 \text{ nF}$ $L_i = 20 \mu\text{H}$

# Pressure Measurement

## Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

1

<b>HART Communication</b>		<b>FOUNDATION Fieldbus communication</b>	
HART communication	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
<b>PROFIBUS PA communication</b>		- 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 (totalizer mode and reset function for dosing)	• 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 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		

# Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

## SITRANS P300 for gauge and absolute pressure

1

Selection and Ordering data		Article No.
<b>SITRANS P300 pressure transmitters for relative and absolute pressure</b> , single-chamber measuring housing, rating plate inscription in English		
<b>4 ... 20 mA/HART</b>	➤	<b>7MF8023 -</b>
<b>PROFIBUS PA</b>	➤	<b>7MF8024 -</b>
<b>FOUNDATION Fieldbus (FF)</b>	➤	<b>7MF8025 -</b>
➤ 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>	
Silicone oil	normal	1
Inert liquid	Cleanliness level 2 to DIN 25410	3
<b>Measuring span (min. ... max.)</b>		
8.3 ... 250 mbar	(0.12 ... 3.63 psi)	A
0.01 ... 1 bar	(0.145 ... 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 ... 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>		
Seal diaphragm	Measuring cell	
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> ) <sup>1) 2) 3) 4) 5)</sup>		Y
<b>Process connection</b>		
• 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) <sup>6)</sup>		
- 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
<b>Non-wetted parts materials</b>		
• Stainless steel, deep-drawn and electrolytically polished		4
<b>Version</b>		
• Standard versions		1
<b>Explosion protection</b>		
• None		A
• With ATEX, Type of protection:		
- "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>		
• Screwed gland M20x1.5 (polyamide) <sup>9)</sup>		A
• Screwed gland M20x1.5 (metal)		B
• Screwed gland M20x1.5 (stainless steel)		C
• M12 device plug (stainless steel), without cable socket		G
• Screwed gland 1/2-14 NPT metal thread <sup>10)</sup>		H
• Screwed gland 1/2-14 NPT stainless steel thread		J

Selection and Ordering data		Article No.
<b>SITRANS P300 pressure transmitters for relative and absolute pressure</b> , single-chamber measuring housing, rating plate inscription in English		
<b>4 ... 20 mA/HART</b>		<b>7MF8023 -</b>
<b>PROFIBUS PA</b>		<b>7MF8024 -</b>
<b>FOUNDATION Fieldbus (FF)</b>		<b>7MF8025 -</b>
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
<b>Display</b>		
• Without display, with keys, closed lid		1
• With display and keys, closed lid <sup>11)</sup>		2
• With display and keys, lid with polycarbonate disc		4
• (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units) <sup>11)</sup>		5
• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc <sup>11)</sup>		6
• With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS and FOUNDATION Fieldbus equipment: pressure units) <sup>11)</sup>		7
• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane <sup>11)</sup>		
<b>Power supply units</b> see Chap. 7 "Supplementary Components".		
A quick-start guide is included in the scope of delivery of the device.		
1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here.		
2) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
3) 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		
4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.		
5) Remote seal for direct mounting only available in combination with process connection 1/2-14 NPT.		
6) M10 fastening thread: Max. span 160 bar (2320 psi) 7/16-20 UNF and M12 fastening thread: Max. span 400 bar (5802 psi)		
7) Only available together with electrical connection option A		
8) Only available together with electrical connection options B, C or G.		
9) Only together with HART electronics.		
10) Without cable gland.		
11) Display cannot be turned.		

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 housing, rating plate inscription in English		<b>SITRANS P300 pressure transmitters for relative and absolute pressure with front-flush membrane</b> , single-chamber measuring housing, rating plate inscription in English	
<b>4 ... 20 mA/HART</b>	↗ 7 MF 8 1 2 3 -	<b>4 ... 20 mA/HART</b>	7 MF 8 1 2 3 -
<b>PROFIBUS PA</b>	↗ 7 MF 8 1 2 4 -	<b>PROFIBUS PA</b>	7 MF 8 1 2 4 -
<b>FOUNDATION Fieldbus (FF)</b>	↗ 7 MF 8 1 2 5 -	<b>FOUNDATION Fieldbus (FF)</b>	7 MF 8 1 2 5 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
<b>Measuring cell filling</b>		<b>Display</b>	
Silicone oil	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		• 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	4	• 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>		<b>Power supply units</b> see Chap. 7 "Supplementary Components"	
Seal diaphragm		A quick-start guide is included in the scope of delivery of the device.	
Stainless steel	A		
Hastelloy <sup>2)</sup>	B		
<b>Process connection</b>			
• Flange version with Order code M., N., R.. or Q.. (see "Further designs")	7		
<b>Non-wetted parts materials</b>			
• Stainless steel, deep-drawn and electrolytically polished	4		
<b>Version</b>			
• Standard versions	1		
<b>Explosion protection</b>			
• None	A		
• With ATEX, Type of protection: - "Intrinsic safety (Ex ia)"	B		
• Zone 20/21/22 <sup>3)</sup>	C		
• Ex nA/nL (Zone 2) <sup>4)</sup>	E		
• with FM "intrinsic safety" (cFM <sub>US</sub> )	M		
<b>Electrical connection / cable entry</b>			
• Screwed gland M20x1.5 (polyamide) <sup>5)</sup>	A		
• Screwed gland M20x1.5 (metal)	B		
• Screwed gland M20x1.5 (stainless steel)	C		
• M12 device plug (stainless steel), without cable socket	G		
• Screwed gland ½-14 NPT metal thread <sup>6)</sup>	H		
• Screwed gland ½-14 NPT stainless steel thread <sup>6)</sup>	J		

- 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) Only together with electrical connection option A.
- 4) Only available together with electrical connection options B, C or G.
- 5) Only together with HART electronics.
- 6) Without cable gland.
- 7) Display cannot be turned.



# Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

## SITRANS P300 for gauge and absolute pressure

1

Selection and Ordering data	Order code			
<b>Further designs</b> Add "-Z" to Article No. and specify Order code.		<b>HART</b>	<b>PA</b>	<b>FF</b>
<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	<b>A02</b>	✓	✓	✓
<b>Cable socket for M12 device plugs</b> • Stainless steel	<b>A51</b>	✓	✓	✓
<b>Rating plate inscription</b> (instead of English)				
• German	<b>B10</b>	✓	✓	✓
• French	<b>B12</b>	✓	✓	✓
• Spanish	<b>B13</b>	✓	✓	✓
• Italian	<b>B14</b>	✓	✓	✓
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	<b>B21</b>	✓	✓	✓
<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<sup>1)</sup></b>	<b>C11</b>	✓	✓	✓
<b>Inspection certificate<sup>2)</sup></b> Acc. to EN 10204-3.1	<b>C12</b>	✓	✓	✓
<b>Factory certificate</b> Acc. to EN 10204-2.2	<b>C14</b>	✓	✓	✓
<b>Degree of protection IP65/IP68</b> (only for M20x1.5 and ½-14 NPT)	<b>D12</b>	✓	✓	✓
<b>Degree of protection IP6k9k</b> (only for M20x1.5)	<b>D46</b>	✓	✓	✓
<b>CRN approval Canada</b> (Canadian Registration Number)	<b>E22</b>	✓	✓	✓
<b>Export approval Korea</b>	<b>E11</b>	✓	✓	✓
<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	<b>E80</b>	✓	✓	✓
<b>Ex Approval Ex ia/ib NEPSI</b>	<b>E55</b>	✓	✓	✓
<b>Only for SITRANS P300 with front-flush diaphragm (7MF81...-...)</b>				
<b>Flange to EN 1092-1, Form B1</b>				
• DN 25, PN 40 <sup>3)</sup>	<b>M11</b>	✓	✓	✓
• DN 40, PN 40	<b>M13</b>	✓	✓	✓
• DN 40, PN 100	<b>M23</b>	✓	✓	✓
• DN 50, PN 16	<b>M04</b>	✓	✓	✓
• DN 50, PN 40	<b>M14</b>	✓	✓	✓
• DN 80, PN 16	<b>M06</b>	✓	✓	✓
• DN 80, PN 40	<b>M16</b>	✓	✓	✓
<b>Flanges to ASME B16.5</b>				
• 1", class 150 <sup>4)</sup>	<b>M40</b>	✓	✓	✓
• 1½", class 150	<b>M41</b>	✓	✓	✓
• 2", class 150	<b>M42</b>	✓	✓	✓
• 3", class 150	<b>M43</b>	✓	✓	✓
• 4", class 150	<b>M44</b>	✓	✓	✓
• 1", class 300 <sup>4)</sup>	<b>M45</b>	✓	✓	✓
• 1½", class 300	<b>M46</b>	✓	✓	✓
• 2", class 300	<b>M47</b>	✓	✓	✓
• 3", class 300	<b>M48</b>	✓	✓	✓
• 4", class 300	<b>M49</b>	✓	✓	✓
<b>Threaded connector to DIN 3852-2, form A, thread to ISO 228</b>				
• G ¾"-A, front-flush <sup>4)</sup>	<b>R01</b>	✓	✓	✓
• G 1"-A, front-flush <sup>4)</sup>	<b>R02</b>	✓	✓	✓
• G 2"-A, front-flush	<b>R04</b>	✓	✓	✓
<b>Tank connection<sup>5)</sup></b> Sealing is included in delivery				
• TG 52/50, PN 40	<b>R10</b>	✓	✓	✓
• TG 52/150, PN 40	<b>R11</b>	✓	✓	✓

Selection and Ordering data	Order code			
<b>Further designs</b> Add "-Z" to Article No. and specify Order code.		<b>HART</b>	<b>PA</b>	<b>FF</b>
<b>Sanitary process connection according DIN 11851 (Dairy connection with slotted union nut)</b> • DN 50, PN 25 • DN 80, PN 25	<b>N04</b> <b>N06</b>	✓	✓	✓
<b>Tri-Clamp connection according DIN 32676/ISO 2852</b> 3A compliant <sup>6)</sup>				
• DN 50/2", PN 16	<b>N14</b>	✓	✓	✓
• DN 65/2.5", PN 10	<b>N15</b>	✓	✓	✓
<b>Varivent connection</b> 3A and EHEDG compliant <sup>6)</sup>				
• Type N = 68 for Varivent housing DN 40 ... 125 and 1½" ... 6", PN 40	<b>N28</b>	✓	✓	✓
<b>Temperature decoupler up to 200 °C<sup>7)</sup></b> for front-flush diaphragm version	<b>P00</b>	✓	✓	✓
<b>Bio-Control sanitary process connection</b> • DN 50, PN 16 • DN 65, PN 16	<b>Q53</b> <b>Q54</b>	✓	✓	✓
<b>Sanitary process connection to DRD</b> • DN 50, PN 40	<b>M32</b>	✓	✓	✓
<b>SMS socket with union nut</b>				
• 2"	<b>M67</b>	✓	✓	✓
• 2½"	<b>M68</b>	✓	✓	✓
• 3"	<b>M69</b>	✓	✓	✓
<b>SMS threaded socket</b>				
• 2"	<b>M73</b>	✓	✓	✓
• 2½"	<b>M74</b>	✓	✓	✓
• 3"	<b>M75</b>	✓	✓	✓
<b>IDF socket with union nut ISO 2853</b>				
• 2"	<b>M82</b>	✓	✓	✓
• 2½"	<b>M83</b>	✓	✓	✓
• 3"	<b>M84</b>	✓	✓	✓
<b>IDF threaded socket ISO 2853</b>				
• 2"	<b>M92</b>	✓	✓	✓
• 2½"	<b>M93</b>	✓	✓	✓
• 3"	<b>M94</b>	✓	✓	✓
<b>Sanitary process connection to NEUMO Bio-Connect screw connection</b> 3A and EHEDG compliant <sup>6)</sup>				
• DN 50, PN 16	<b>Q05</b>	✓	✓	✓
• DN 65, PN 16	<b>Q06</b>	✓	✓	✓
• DN 80, PN 16	<b>Q07</b>	✓	✓	✓
• DN 100, PN 16	<b>Q08</b>	✓	✓	✓
• DN 2", PN 16	<b>Q13</b>	✓	✓	✓
• DN 2½", PN 16	<b>Q14</b>	✓	✓	✓
• DN 3", PN 16	<b>Q15</b>	✓	✓	✓
• DN 4", PN 16	<b>Q16</b>	✓	✓	✓
<b>Sanitary process connection to NEUMO Bio-Connect flange connection</b> 3A and EHEDG compliant <sup>6)</sup>				
• DN 50, PN 16	<b>Q23</b>	✓	✓	✓
• DN 65, PN 16	<b>Q24</b>	✓	✓	✓
• DN 80, PN 16	<b>Q25</b>	✓	✓	✓
• DN 100, PN 16	<b>Q26</b>	✓	✓	✓
• DN 2", PN 16	<b>Q31</b>	✓	✓	✓
• DN 2½", PN 16	<b>Q32</b>	✓	✓	✓
• DN 3", PN 16	<b>Q33</b>	✓	✓	✓
• DN 4", PN 16	<b>Q34</b>	✓	✓	✓

# Pressure Measurement

## Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

1

Selection and Ordering data	Order code			
<b>Further designs</b>		<b>HART</b>	<b>PA</b>	<b>FF</b>
Add "-Z" to Article No. and specify Order code.				
<b>Sanitary process connection to NEUMO Bio-Connect clamp connection</b> 3A and EHEDG compliant <sup>6)</sup>				
• DN 50, PN 16	<b>Q39</b>	✓	✓	✓
• DN 65, PN 10	<b>Q40</b>	✓	✓	✓
• DN 80, PN 10	<b>Q41</b>	✓	✓	✓
• DN 100, PN 10	<b>Q42</b>	✓	✓	✓
• DN 2½", PN 16	<b>Q48</b>	✓	✓	✓
• DN 3", PN 10	<b>Q49</b>	✓	✓	✓
• DN 4", PN 10	<b>Q50</b>	✓	✓	✓
<b>Sanitary process connection to NEUMO Bio-Connect S flange connection</b>				
• DN 2", PN 16	<b>Q72</b>	✓	✓	✓
<b>Aseptic threaded socket to DIN 11864-1 Form A</b> 3A compliant <sup>6)</sup>				
• DN 50, PN 25	<b>N33</b>	✓	✓	✓
• DN 65, PN 25	<b>N34</b>	✓	✓	✓
• DN 80, PN 25	<b>N35</b>	✓	✓	✓
• DN 100, PN 25	<b>N36</b>	✓	✓	✓
<b>Aseptic flange with notch to DIN 11864-2 Form A</b> 3A compliant <sup>6)</sup>				
• DN 50, PN 16	<b>N43</b>	✓	✓	✓
• DN 65, PN 16	<b>N44</b>	✓	✓	✓
• DN 80, PN 16	<b>N45</b>	✓	✓	✓
• DN 100, PN 16	<b>N46</b>	✓	✓	✓
<b>Aseptic flange with groove to DIN 11864-2 Form A</b> 3A compliant <sup>6)</sup>				
• DN 50, PN 16	<b>N43 + P11</b>	✓	✓	✓
• DN 65, PN 16	<b>N44 + P11</b>	✓	✓	✓
• DN 80, PN 16	<b>N45 + P11</b>	✓	✓	✓
• DN 100, PN 16	<b>N46 + P11</b>	✓	✓	✓
<b>Aseptic clamp with groove to DIN 11864-3 Form A</b> 3A compliant <sup>6)</sup>				
• DN 50, PN 25	<b>N53</b>	✓	✓	✓
• DN 65, PN 25	<b>N54</b>	✓	✓	✓
• DN 80, PN 16	<b>N55</b>	✓	✓	✓
• DN 100, PN 16	<b>N56</b>	✓	✓	✓

Selection and Ordering data	Order code			
<b>Additional data</b>		<b>HART</b>	<b>PA</b>	<b>FF</b>
Please add "-Z" to Article No. and specify Order code(s) and plain text.				
<b>Measuring range to be set</b>	<b>Y01</b>	✓	✓ <sup>8)</sup>	
Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi				
<b>Stainless steel tag plate and entry in device variable (measuring point description)</b>	<b>Y15</b>	✓	✓	✓
Max. 16 characters, specify in plain text: Y15: .....				
<b>Measuring point text (entry in device variable)</b>	<b>Y16</b>	✓	✓	✓
Max. 27 characters, specify in plain text: Y16: .....				
<b>Entry of HART TAG</b>	<b>Y17</b>	✓		
Max. 8 characters, specify in plain text: Y17: .....				
<b>Setting of the display in pressure units</b>	<b>Y21</b>	✓	✓	✓
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>1)</sup> , inH <sub>2</sub> O <sup>1)</sup> , ftH <sub>2</sub> O <sup>1)</sup> , mmHG, inHG, psi, Pa, kPa, MPa, g/cm <sup>2</sup> , kg/cm <sup>2</sup> , Torr, ATM or % ) ref. temperature 20 °C				
<b>Setting of the display in non-pressure units<sup>9)</sup></b>	<b>Y22 + Y01</b>	✓		
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>Preset bus address</b>	<b>Y25</b>		✓	✓
(possible between 1 ... 126) Specify in plain text: Y25: .....				
Factory mounting of valve manifolds, see accessories.				
Only Y01, Y15, Y16, Y17, Y21, Y22 and Y25 can be factory preset				
✓ = available				
<b>Ordering example</b>				
Item line: 7MF8023-1DB24-1AB7-Z				
B line: A02 + Y01 + Y21				
C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)				
C line: Y21: bar (psi)				

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

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

3) 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.

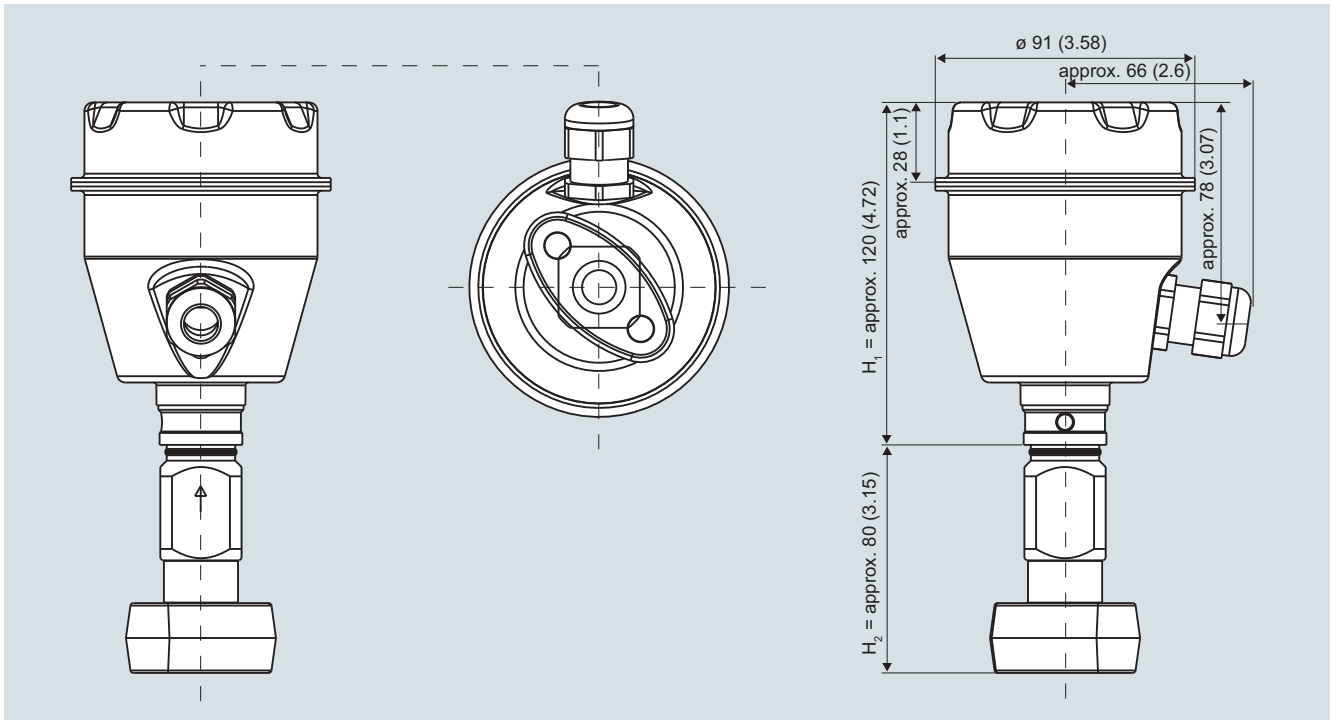
9) Preset values can only be changed over SIMATIC PDM.

## Pressure Measurement

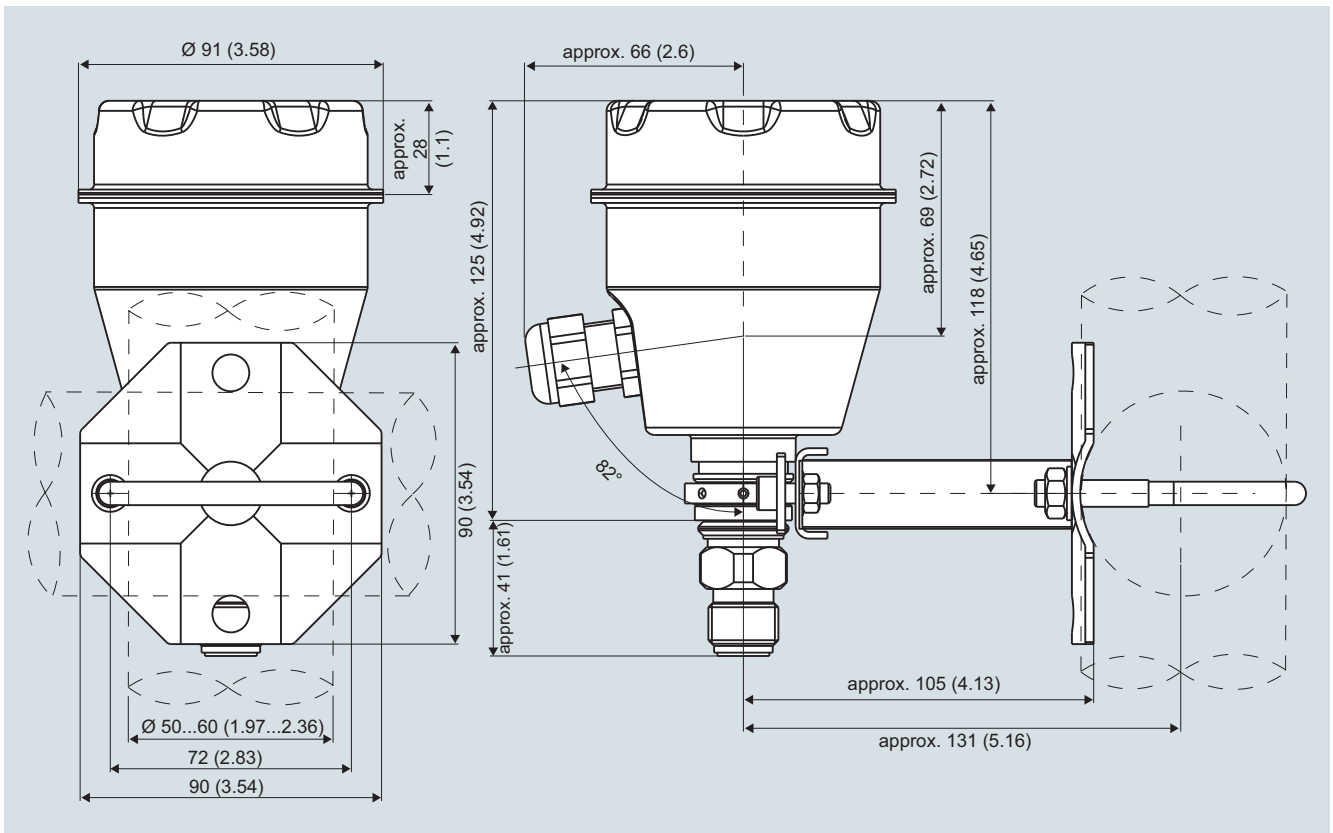
Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

#### Dimensional drawings



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



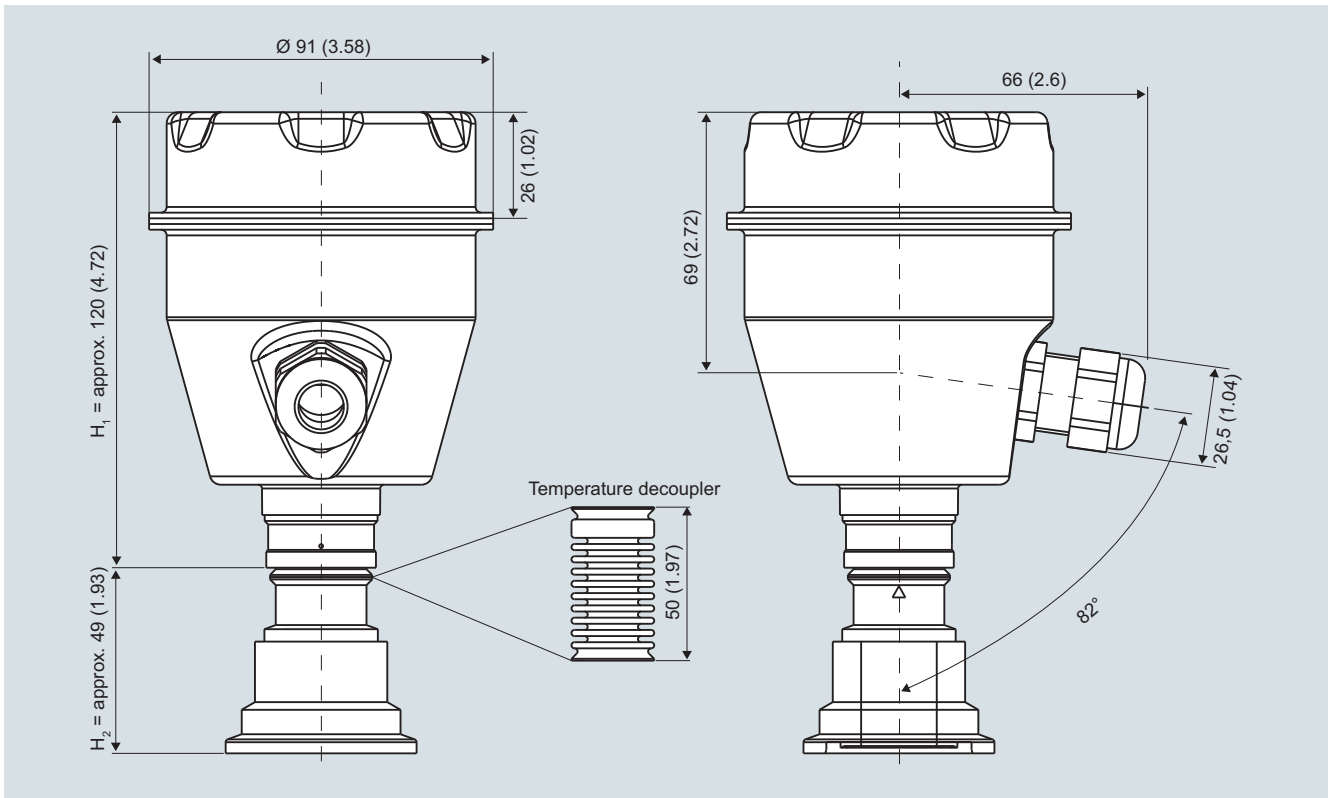
SITRANS P300, process connection M20 x 1.5, with mounted mounting bracket, dimensions in mm (inch)

## Pressure Measurement

### Transmitters for food, pharmaceuticals and biotechnology

#### SITRANS P300 for gauge and absolute pressure

1



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.

## Pressure Measurement

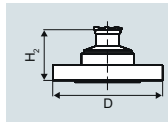
Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 for gauge and absolute pressure

#### Flanges as per EN and ASME

##### Flange to EN

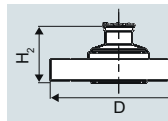
###### EN 1092-1



Order code	DN	PN	ØD	H <sub>2</sub>
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 to ASME

###### ASME B16.5

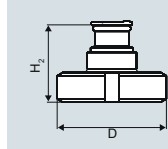


Order code	DN	PN	ØD	H <sub>2</sub>
M40	1"	150	110 mm (4.3")	Approx. 52 mm (2")
M41	1½"	150	130 mm (5.1")	
M42	2"	150	150 mm (5.9")	
M43	3"	150	190 mm (7.5")	
M44	4"	150	230 mm (9.1")	
M46	1½"	300	155 mm (6.1")	
M47	2"	300	165 mm (6.5")	
M48	3"	300	210 mm (8.1")	
M49	4"	300	255 mm (10.0")	

#### NuG and pharmaceutical connections

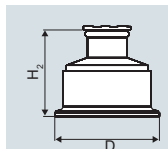
##### Connections to DIN

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



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

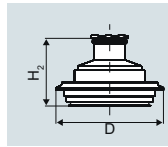
###### Tri-Clamp nach DIN 32676



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

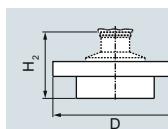
##### Other connections

###### Varivent connection



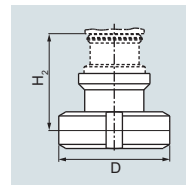
Order code	DN	PN	ØD	H <sub>2</sub>
N28	40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

###### Sanitary process connection to DRD



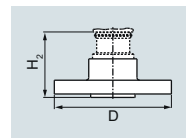
Order code	DN	PN	ØD	H <sub>2</sub>
M32	50	40	105 mm (4.1")	Approx. 52 mm (2")

###### Sanitary process screw connection to NEUMO Bio-Connect



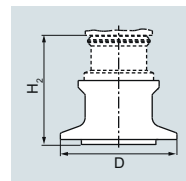
Order code	DN	PN	ØD	H <sub>2</sub>
Q05	50	16	82 mm (3.2")	Approx. 52 mm (2")
Q06	65	16	105 mm (4.1")	
Q07	80	16	115 mm (4.5")	
Q08	100	16	145 mm (5.7")	
Q13	2"	16	82 mm (3.2")	
Q14	2½"	16	105 mm (4.1")	
Q15	3"	16	105 mm (4.1")	
Q16	4"	16	145 mm (5.7")	

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



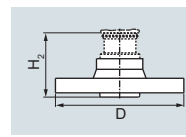
Order code	DN	PN	ØD	H <sub>2</sub>
Q23	50	16	110 mm (4.3")	Approx. 52 mm (2")
Q24	65	16	140 mm (5.5")	
Q25	80	16	150 mm (5.9")	
Q26	100	16	175 mm (6.9")	
Q31	2"	16	100 mm (3.9")	
Q32	2½"	16	110 mm (4.3")	
Q33	3"	16	140 mm (5.5")	
Q34	4"	16	175 mm (6.9")	

###### Sanitary process connection to NEUMO Bio-Connect clamp connection



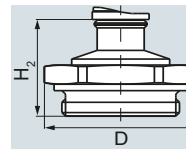
Order code	DN	PN	ØD	H <sub>2</sub>
Q39	50	16	77.4 mm (3.0")	Approx. 52 mm (2")
Q40	65	10	90.9 mm (3.6")	
Q41	80	10	106 mm (4.2")	
Q42	100	10	119 mm (4.7")	
Q48	2½"	16	90.9 mm (3.6")	
Q49	3"	10	106 mm (4.2")	
Q50	4"	10	119 mm (4.7")	

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



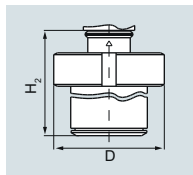
Order code	DN	PN	ØD	H <sub>2</sub>
Q72	2"	16	125 mm (4.9")	Approx. 52 mm (2")

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



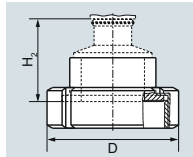
Order code	DN	PN	ØD	H <sub>2</sub>
R01	¾"	60	37 mm (1.5")	Approx. 45 mm (1.8")
R02	1"	60	48 mm (1.9")	Approx. 47 mm (1.9")
R04	2"	60	78 mm (3.1")	Approx. 52 mm (2")

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



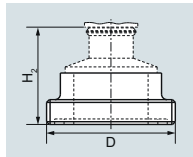
Order code	DN	PN	ØD	H <sub>2</sub>
R10	25	40	63 mm (2.5")	Approx. 63 mm (2.5")
R11	25	40	63 mm (2.5")	Approx. 170 mm (6.7")

## SMS socket with union nut



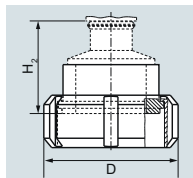
Order code	DN	PN	ØD	H <sub>2</sub>
M67	2"	25	84 mm (3.3")	Approx. 52 mm (2")
M68	2½"	25	100 mm (3.9")	
M69	3"	25	114 mm (4.5")	

## SMS threaded socket



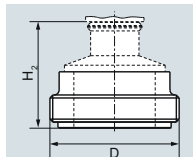
Order code	DN	PN	ØD	H <sub>2</sub>
M73	2"	25	70 x 1/6 mm	Approx. 52 mm (2")
M74	2½"	25	85 x 1/6 mm	
M75	3"	25	98 x 1/6 mm	

## IDF socket with union nut



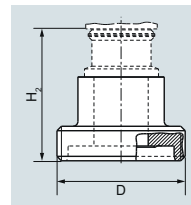
Order code	DN	PN	ØD	H <sub>2</sub>
M82	2"	25	77 mm (3")	Approx. 52 mm (2")
M83	2½"	25	91 mm (3.6")	
M84	3"	25	106 mm (4.2")	

## IDF threaded socket



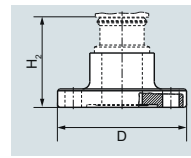
Order code	DN	PN	ØD	H <sub>2</sub>
M92	2"	25	64 mm (2.5")	Approx. 52 mm (2")
M93	2½"	25	77.5 mm (3.1")	
M94	3"	25	91 mm (3.6")	

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



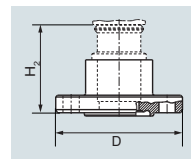
Order code	DN	PN	ØD	H <sub>2</sub>
N33	50	25	78 x 1/6"	Approx. 52 mm (2")
N34	65	25	95 x 1/6"	
N35	80	25	110 x 1/4"	
N36	100	25	130 x 1/4"	

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



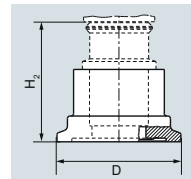
Order code	DN	PN	ØD	H <sub>2</sub>
N43	50	16	94	Approx. 52 mm (2")
N44	65	16	113	
N45	80	16	133	
N46	100	16	159	

## 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	

## Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

### SITRANS P300 Accessories/Spare parts

Selection and Ordering data	Article No.
<i>Spare parts / Accessories</i>	
<b>Mounting bracket and fastening parts kit</b> made of stainless steel	<b>7MF8997-1AA</b>
<b>Lid without window</b> gasket not included	<b>7MF8997-1BA</b>
<b>Lid with glass window</b> gasket not included	<b>7MF8997-1BD</b>
<b>NBR enclosure sealing</b>	<b>7MF8997-1BG</b>
<b>Measuring point label</b> unlabeled	<b>7MF8997-1CA</b>
<b>Cable gland</b> <ul style="list-style-type: none"> <li>metal</li> <li>plastic (blue)</li> </ul>	<b>7MF8997-1EA</b> <b>7MF8997-1EB</b>
<b>Weldable sockets for PMC connection</b> <ul style="list-style-type: none"> <li>PMC Style Standard: Thread 1½"</li> <li>PMC Style Minibolt: front-flush 1"</li> </ul>	<b>7MF4997-2HA</b> <b>7MF4997-2HB</b>
<b>Gaskets for PMC connection</b> (packing unit = 5 units) <ul style="list-style-type: none"> <li>PTFE seal for PMC Style Standard: Thread 1½"</li> <li>Gasket made of Viton for PMC Style Minibolt: front-flush 1"</li> </ul>	<b>7MF4997-2HC</b> <b>7MF4997-2HD</b>
<b>Weldable socket for TG 52/50 and TG 52/150 connection</b> <ul style="list-style-type: none"> <li>TG 52/50 connection</li> <li>TG5 2/150 connection</li> </ul>	<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 <ul style="list-style-type: none"> <li>DN 25, PN 40 (M11)</li> <li>1", class 150 (M40)</li> </ul>	<b>7MF4997-2HH</b> <b>7MF4997-2HK</b>

Selection and Ordering data	Article No.
<b>Documentation</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>	
Compact operating instructions <ul style="list-style-type: none"> <li>English, German, Spanish, French, Italian, Dutch</li> </ul>	<b>A5E03434657</b>
<b>Certificates (order only via SAP)</b> instead of Internet download <ul style="list-style-type: none"> <li>hard copy (to order)</li> <li>on DVD (to order)</li> </ul>	<b>A5E03252406</b> <b>A5E03252407</b>
<b>HART modem</b> with USB interface	<b>7MF4997-1DB</b>
Power supply units see Chap. 7 "Supplementary Components".	

**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 gaskets made of PTFE between 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.

Once installed, the complete unit is checked under pressure for leaks (compressed air 6 bar (87 psi)) and is certified leak-proof with a test report to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the respective 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 acceptance test certificate 3.1 to EN 10204 when choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitters and the valve manifolds respectively.

**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

SITRANS P300 7MF802-...1.-...	<b>T03</b>
----------------------------------	------------

With process connection female thread ½-14 NPT in-sealed with PTFE sealing tape

Delivery incl. high-pressure test certified by test report 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)	<b>A02</b>
--	------------

Supplied acceptance test certificate to EN 10204- 3.1 for transmitters and mounted valve manifold	<b>C12</b>
---	------------

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

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

SITRANS P300 7MF802-...0.-...	<b>T02</b>
----------------------------------	------------

with process connection collar G½ A to EN 837-1 with gasket made of PTFE between valve manifold and transmitter

**Alternative sealing material:**

- |                                   |            |
|-----------------------------------|------------|
| • Soft iron                       | <b>A70</b> |
| • Stainless steel, Mat. No. 14571 | <b>A71</b> |
| • copper                          | <b>A72</b> |

Delivery incl. high-pressure test certified by test report 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)	<b>A02</b>
--	------------

Supplied acceptance test certificate to EN 10204- 3.1 for transmitters and mounted valve manifold	<b>C12</b>
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## Pressure Measurement

Transmitters for food, pharmaceuticals and biotechnology

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

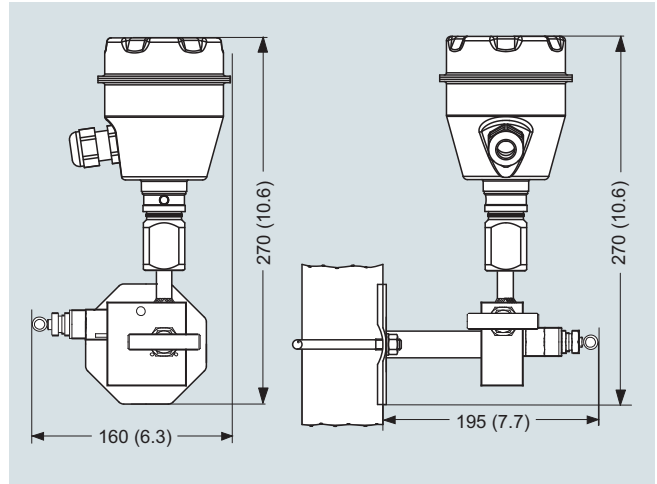
1

#### Dimensional drawings

##### Valve manifolds mounted on SITRANS P300



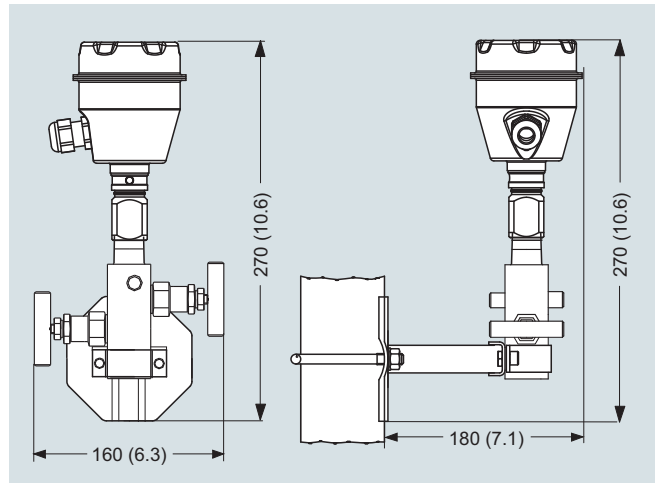
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters



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)

## Overview



The SITRANS P300 and DS III pressure transmitters have been fitted with special process connections for the paper industry. With the two process connection threads 1½" and 1" flush at the front, the SITRANS P300 and DS III transmitters can be used for all processes in the paper industry.

SITRANS P300 and SITRANS PDS III series pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameterization is performed using control keys 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).

Various versions of the pressure transmitters are available for measuring:

- Gauge pressure
- Level
- Mass level
- Volume level

## Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads, e.g. abrasion.
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions
- Minimum conformity error
- Small long-term drift
- Wetted parts made of Hastelloy
- Infinitely adjustable span from 0.03 bar to 16 bar (0.43 psi to 232 psi) for DS III with HART interface
- Nominal measuring range from 1 bar to 16 bar (14.5 psi to 232 psi) for DS III with PROFIBUS PA and FOUNDATION Fieldbus interface
- Infinitely adjustable span from 0.03 bar to 16 bar (0.43 psi to 232 psi) for SITRANS P300 with HART interface
- Nominal measuring range from 1 bar to 16 bar (14.5 psi to 232 psi) for SITRANS P300 with PROFIBUS PA interface
- High measuring accuracy
- Parameterization over control keys and HART Communication, or over PROFIBUS PA or FOUNDATION Fieldbus interface (DS III only).

## 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 operated locally over 3 control keys or programmed externally over HART or over PROFIBUS-PA or FOUNDATION Fieldbus interface (only DS III).

### **SITRANS P, DS III series**

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

#### Span (infinitely adjustable)

For DS III with HART: 0.03 ... 16 bar (0.433 ... 232 psi)

#### Nominal measuring range

For DS III with PROFIBUS PA or FOUNDATION Fieldbus: 1 ... 16 bar (14.5 ... 232 psi)

### **SITRANS P300**

#### Span (infinitely adjustable)

For DS III with HART: 0.03 ... 16 bar (0.433 ... 232 psi)

#### Nominal measuring range

For DS III with PROFIBUS PA or FOUNDATION Fieldbus: 1 ... 16 bar (14.5 ... 232 psi)

## Pressure Measurement

Transmitters for gauge pressure for the paper industry

### SITRANS P DS III and P300 with PMC connection - Technical description

1

#### Design

##### SITRANS P DS III



- 1 Plastic cover as access to the input keys
- 2 Screw cover with viewing pane
- 3 Digital display
- 4 Locking screw
- 5 Process connection
- 6 Screw cover with viewing pane
- 7 Rating plate
- 8 Inlet with cable gland

Device front view, SITRANS P DS III

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

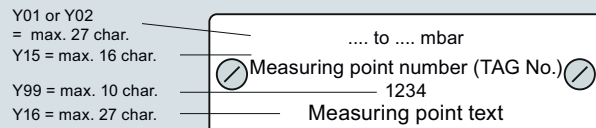
The approval label is located on the opposite side.

The housing is made of die-cast aluminium or stainless steel precision casting. A round cover is screwed on at the front and rear of the housing. The front cover (2) can be fitted with a viewing pane so that the measured values can be read directly on the display. The inlet (8) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the housing.

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

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

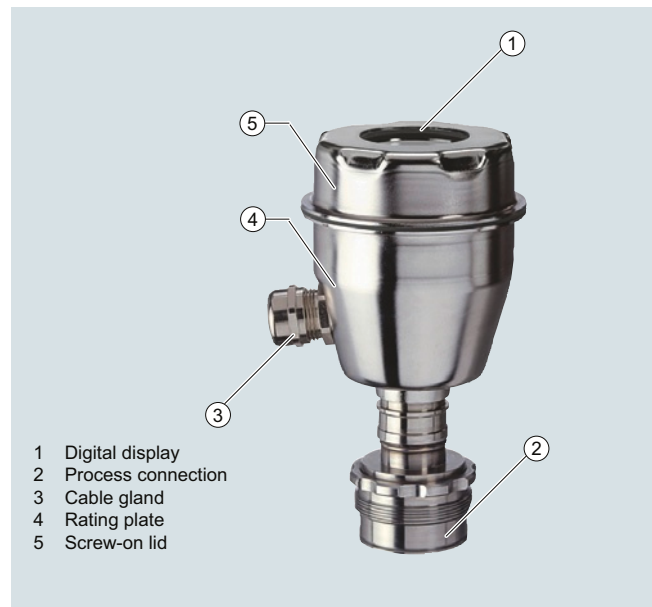
#### Example for an attached measuring point label



##### SITRANS P300

The device comprises:

- Electronics
- Housing
- Measuring cell



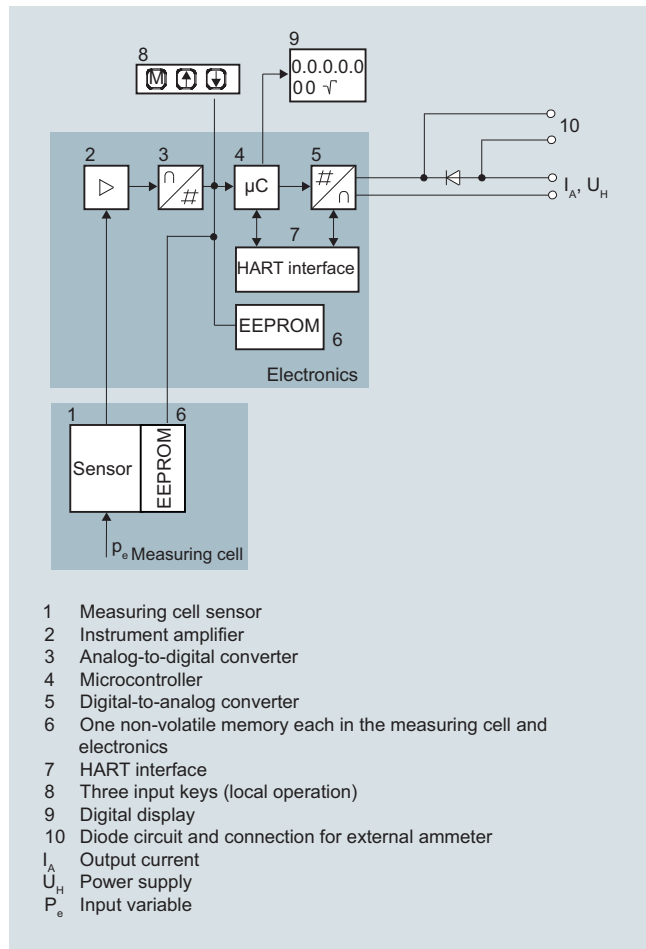
- 1 Digital display
- 2 Process connection
- 3 Cable gland
- 4 Rating plate
- 5 Screw-on lid

Perspective view of the SITRANS P300

The housing has a screw-on lid (5) and, depending on the version, is with or without an inspection window. The electrical terminal housing, 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 UH and the shield are in the terminal housing. The cable gland is on the side of the housing. The measuring cell with the process connection (2) is located on the bottom of the housing. The measuring cell with the process connection may differ from the one shown in the diagram, depending on the device version.

## Function

## Operation of electronics with HART 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 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.

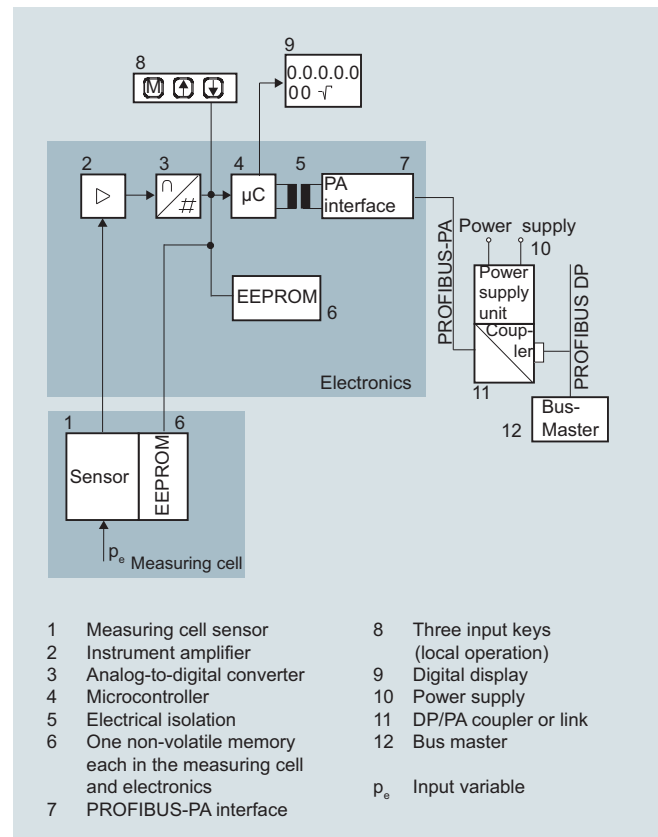
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced 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 spans  $\leq 63$  bar (914 psi) measure the input pressure compared to atmosphere, the transmitters with spans 160 bar (2320 psi) measure 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 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 first memory is linked with the measuring cell, the second with the electronics. This modular design means that the electronics and the measuring cell can be replaced separately from one another.

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).

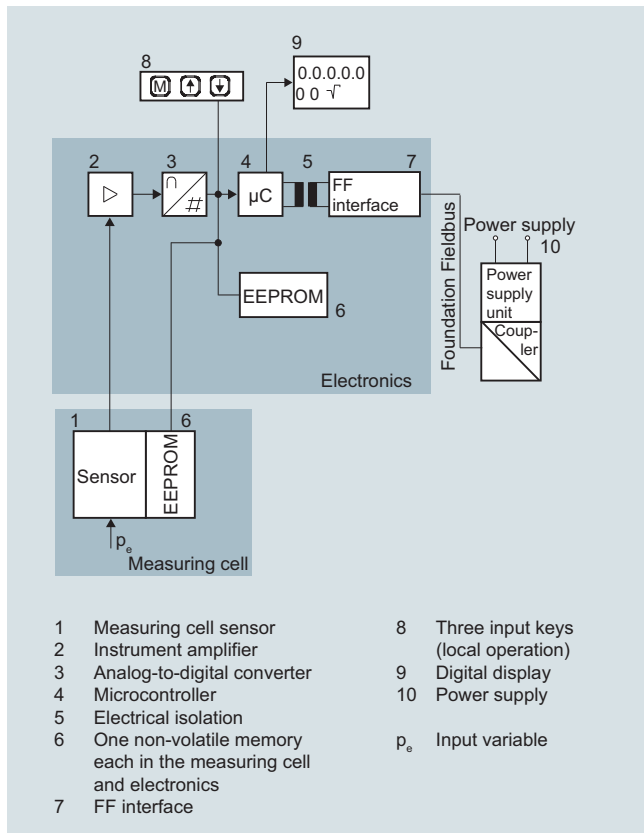
The results with status values and diagnostic values are transferred by cyclic data transmission on the PROFIBUS PA. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as SIMATIC PDM is required for this.

## Pressure Measurement

Transmitters for gauge pressure for the paper industry

### SITRANS P DS III and P300 with PMC connection - Technical description

#### 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).

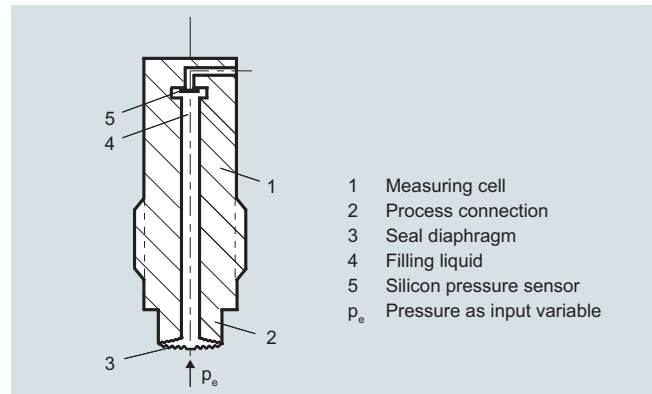
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

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.

#### Parameterization

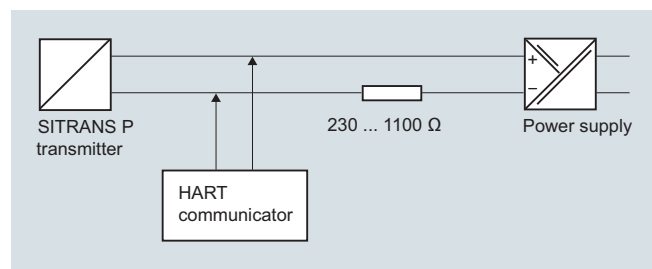
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

#### Parameterization using the input buttons (local operation)

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

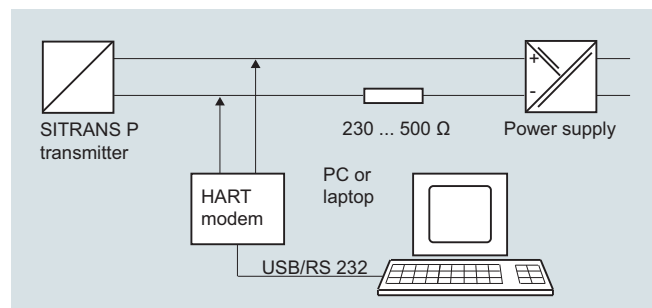
#### Parameterization using HART

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 parameter DS III with HART and P300 with HART

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

<sup>1)</sup> Cancel apart from write protection

#### Diagnostic functions for DS III with HART and P300 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 and P300 with HART

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

#### Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. The PROFIBUS connects the DS III 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 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, and 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 DS III with PROFIBUS PA and FOUNDATION Fieldbus, and 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, hPa, 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, 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
Temperature	K, °C, °F, °R
Miscellaneous	%

# Pressure Measurement

Transmitters for gauge pressure for the paper industry

## SITRANS P DS III with PMC connection

1

### Technical specifications

#### SITRANS P, DS III series for gauge pressure with PMC connection for the paper industry

Input																																															
Measured variable	Gauge pressure																																														
Span (fully adjustable) or measuring range, max. operating pressure and max. test pressure	<table border="1"> <thead> <tr> <th>HART</th> <th>PROFIBUS PA/ FOUNDATION Fieldbus</th> <th>Max. operating pressure MAWP (PS)</th> <th>Max. perm. test pressure</th> </tr> </thead> <tbody> <tr> <td>Span</td> <td>Nominal measuring range</td> <td></td> <td></td> </tr> <tr> <td>0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi</td> <td>1 bar 100 kPa 14.5 psi</td> <td>4 bar 400 kPa 58 psi</td> <td>6 bar 600 kPa 87 psi</td> </tr> <tr> <td>0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi</td> <td>4 bar 400 kPa 58 psi</td> <td>7 bar 0.7 MPa 102 psi</td> <td>10 bar 1 MPa 145 psi</td> </tr> <tr> <td>0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi</td> <td>16 bar 1600 kPa 232 psi</td> <td>21 bar 2.1 MPa 305 psi</td> <td>32 bar 3.2 MPa 464 psi</td> </tr> </tbody> </table>	HART	PROFIBUS PA/ FOUNDATION Fieldbus	Max. operating pressure MAWP (PS)	Max. perm. test pressure	Span	Nominal measuring range			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																										
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SITRANS P, DS III series for gauge pressure with PMC connection for the paper industry		
	HART	PROFIBUS PA and FOUNDATION Fieldbus
<b>Rated conditions</b>		
Degree of protection	IP66 (optional IP66/IP68)	
<ul style="list-style-type: none"> <li>• according to EN 60529</li> <li>• according to NEMA 250</li> </ul>	Type 4X	
Temperature of medium	-40 ... +100 °C (-40 ... +212 °F)	
Ambient conditions		
<ul style="list-style-type: none"> <li>• Ambient temperature</li> <li>- Transmitter</li> </ul>	-20 ... +85 °C (-4 ... +185 °F)	
<ul style="list-style-type: none"> <li>• Storage temperature</li> </ul>	-40 ... +85 °C (-40 ... +185 °F)	
<ul style="list-style-type: none"> <li>• Climatic class</li> <li>- Condensation</li> </ul>	-50 ... +85 °C (-58 ... +185 °F)	
<ul style="list-style-type: none"> <li>• Electromagnetic Compatibility</li> <li>- Emitted interference and interference immunity</li> </ul>	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
<ul style="list-style-type: none"> <li>• Electromagnetic Compatibility</li> <li>- Emitted interference and interference immunity</li> </ul>	Acc. to IEC 61326 and NAMUR NE 21	
<b>Design</b>		
Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AISI12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
<ul style="list-style-type: none"> <li>• Gasket (standard)</li> </ul>	PTFE flat gasket	
<ul style="list-style-type: none"> <li>• O-ring (minibolt)</li> </ul>	FPM (Viton) or optionally: FFPM or NBR	
Measuring cell filling	Silicone oil or inert filling liquid	
Process connection (standard)	Flush-mounted, 1½", PMC Standard design	
Process connection (minibolt)	Flush-mounted, 1", minibolt design	
<b>Power supply <math>U_H</math></b>		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply	-	Supplied through bus
Separate 24 V power supply	-	Not necessary
Bus voltage		
<ul style="list-style-type: none"> <li>• Not Ex</li> </ul>	-	9 ... 32 V
<ul style="list-style-type: none"> <li>• With intrinsically-safe operation</li> </ul>	-	9 ... 24 V
Current consumption		
<ul style="list-style-type: none"> <li>• Basic current (max.)</li> </ul>	-	12.5 mA
<ul style="list-style-type: none"> <li>• Start-up current ≤ basic current</li> </ul>	-	Yes
<ul style="list-style-type: none"> <li>• Max. current in event of fault</li> </ul>	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes
<b>Certificates and approvals</b>		
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)	



# Pressure Measurement

Transmitters for gauge pressure for the paper industry

## SITRANS P DS III with PMC connection

1

HART communication		FOUNDATION Fieldbus communication	
HART communication	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
<b>PROFIBUS PA communication</b>		- 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

## Transmitters for gauge pressure for the paper industry

### SITRANS P DS III with PMC connection

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Selection and Ordering data	Article No.
<b>SITRANS P pressure transmitters for gauge pressure, with PMC connection series DS III with HART</b>	<b>7 MF 4 1 3 3 -</b>
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
<b>Measuring cell-cleaning</b>	
normal	
grease-free to cleanliness level 2	
<b>Measuring span (min. ... max.)</b>	
0.01 ... 1 bar <sup>1)</sup> (0.15 ... 14.5 psi) <sup>1)</sup>	B
0.04 ... 4 bar (0.58 ... 58 psi)	C
0.1.6 ... 16 bar (2.32 ... 232 psi)	D
<b>Wetted parts materials</b>	
Seal diaphragm	
Connection shank	
Hastelloy	B
Stainless steel	
<b>Process connection</b>	
• PMC Style Standard: Thread 1½"	2
• PMC Style Minibolt: front-flush 1" (not with minimum span: 500 mbar (7.25 psi) - version "B")	3
<b>Non-wetted parts materials</b>	
• Housing made of die-cast aluminium	0
• Housing stainless steel precision casting	3
<b>Version</b>	
• 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.	
<b>Explosion protection</b>	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)" <sup>2)</sup>	D
- „Ex nA/ic (Zone 2)" <sup>3)</sup>	E
• FM + CSA intrinsic safe (is) <sup>4)</sup>	F
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)" <sup>3)4)</sup>	NC
<b>Electrical connection / cable entry</b>	
• Female thread M20 x 1.5	B
• Female thread ½-14 NPT	C
• M12 device plugs (stainless steel) <sup>5) 6)</sup>	F
<b>Display</b>	
• 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" required)	7

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

Included in delivery of the device:

- Quick-start guide
- Sealing ring

- 1) Only with "PMC Style Standard" process connection
- 2) Without cable gland, with blanking plug
- 3) Configurations with M12 device plugs are only available in Ex ic.
- 4) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 5) Only in connection with Ex approval A, B, E or F.
- 6) M12 delivered without cable socket

Selection and Ordering data	Article No.
<b>SITRANS P pressure transmitter for gauge pressure, with PMC connection DS III with PROFIBUS PA (PA)</b>	<b>7 MF 4 1 3 4 -</b>
<b>DS III with FOUNDATION Fieldbus (FF)</b>	<b>7 MF 4 1 3 5 -</b>
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
<b>Meas. cell cleaning</b>	
normal	
grease-free to cleanliness level 2	
<b>Nominal measuring range</b>	
1 bar <sup>1)</sup> (14.5 psi) <sup>1)</sup>	B
4 bar (58 psi)	C
16 bar (232 psi)	D
<b>Wetted parts materials</b>	
Seal diaphragm	
Connection shank	
Hastelloy	B
Stainless steel	
<b>Process connection<sup>2)</sup></b>	
• PMC Style Standard: Thread 1½"	2
• PMC Style Minibolt: front-flush 1" (minimum span: 500 mbar (7.25 psi), not available with 1-bar-measuring cell (Option B))	3
<b>Non-wetted parts materials</b>	
• Housing made of die-cast aluminium	0
• Housing stainless steel precision casting	3
<b>Version</b>	
• 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.	
<b>Explosion protection</b>	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)" <sup>3)</sup>	D
- „Ex nA/ic (Zone 2)" <sup>4)</sup>	E
• FM + CSA intrinsic safe (is) <sup>5)</sup>	F
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)" <sup>3)5)</sup>	NC
<b>Electrical connection / cable entry</b>	
• Female thread M20 x 1.5	B
• Female thread ½-14 NPT	C
• M12 device plugs (stainless steel) <sup>6) 7)</sup>	F
<b>Display</b>	
• Without display	0
• Without visible display (display concealed, setting: bar)	1
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- Quick-start guide
- Sealing ring

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# Pressure Measurement

Transmitters for gauge pressure for the paper industry

## SITRANS P DS III with PMC connection

1

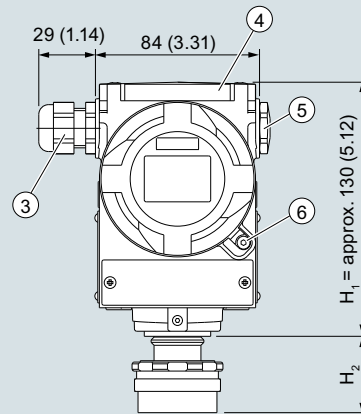
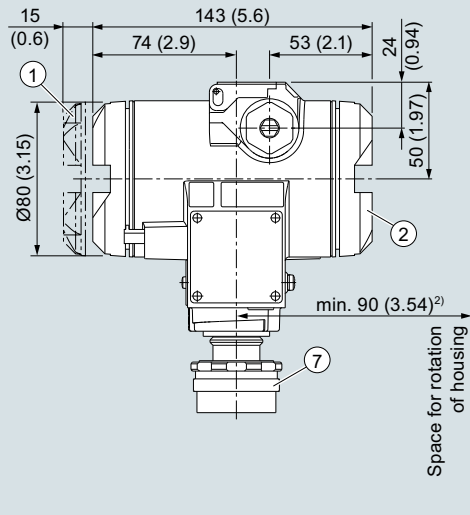
Selection and Ordering data	Order code			Selection and Ordering data	Order code				
<b>Further designs</b> Add "-Z" to Article No. and specify Order code.		HART	PA	FF	<b>Additional data</b> Please add "-Z" to Article No. and specify Order code(s) and plain text.		HART	PA	FF
<b>Device plugs</b> • Angled • Han 8D (metal, gray)	A32 A33	✓ ✓			<b>Measuring range to be set</b> Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓	✓ <sup>1)</sup>	
<b>M12 cable sockets (metal (CuZn))</b>	A50	✓	✓	✓	<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	Y15	✓	✓	✓
<b>Rating plate inscription</b> (instead of German) • English • French • Spanish • Italian • Cyrillic (russian)	B11 B12 B13 B14 B16	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓	<b>Measuring point text (entry in device variable)</b> Max. 27 characters, specify in plain text: Y16: .....	Y16	✓	✓	✓
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓	✓	<b>Entry of HART address (TAG)</b> Max. 8 characters, specify in plain text: Y17: .....	Y17	✓		
<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>	C11	✓	✓	✓	<b>Setting of pressure indication in pressure units</b> 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	Y21	✓	✓	✓
<b>Inspection certificate</b> Acc. to EN 10204-3.1	C12	✓	✓	✓	<b>Setting of pressure indication in non-pressure units<sup>2)</sup></b> 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)	Y22 + Y01	✓		
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	✓	<b>Preset bus address</b> possible between 1 and 126 Max. 8 characters, specify in plain text: Y25: .....	Y25		✓	✓
<b>"Functional safety (SIL2)" certificate acc. to IEC 61508</b>	C20	✓			Only "Y01" and "Y21" can be factory preset ✓ = available				
<b>"Functional safety (SIL2/3)" certificate acc. to IEC 61508</b>	C23	✓			<b>ordering example</b> Item line: 7MF4133-1DB20-1AB7-Z B line: C11 + Y01 + Y21 C line: Y01: 1 ... 10 bar (14.5 ... 145 psi) C line: Y21: bar (psi)				
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓	✓					
<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓	✓	✓					
<b>Degree of protection IP66/IP68</b> (only for M20 x 1.5 and ½-14 NPT)	D12	✓	✓	✓					
<b>Export approval Korea</b>	E11	✓	✓	✓					
<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-...-B..)	E55 <sup>1)</sup>	✓	✓	✓					
<b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-...-D..)	E56 <sup>1)</sup>	✓	✓	✓					
<b>Ex protection "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-...-E..)	E57 <sup>1)</sup>	✓	✓	✓					
<b>Ex protection „Ex ia“, „Ex d" and „Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-...-R..)	E58 <sup>1)</sup>	✓	✓	✓					
<b>Mounting</b> • Weldable sockets for standard 1½" threaded connection • Weldable socket for minibolt connection 1" (incl. screw 5/16-18 UNC-2B and washer)	P01 P02	✓ ✓	✓ ✓	✓ ✓					

<sup>1)</sup> 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.

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

<sup>2)</sup> Preset values can only be changed over SIMATIC PDM.

**Dimensional drawings**



- ① Electronic side, digital display (longer overall length for cover with window)<sup>1)</sup>
- ② Terminal side<sup>1)</sup>
- ③ Electrical connection: Screwed gland M20 x 1,5 or screwed gland ½-14 NPT or M12 device plug

- ④ Protective cover over keys
- ⑤ Blanking plug
- ⑥ Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
- ⑦ Process connection: PMC standard

<sup>1)</sup> Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing  
<sup>2)</sup> 92 mm (3.6 inch) for minimum distance to permit rotation with indicator

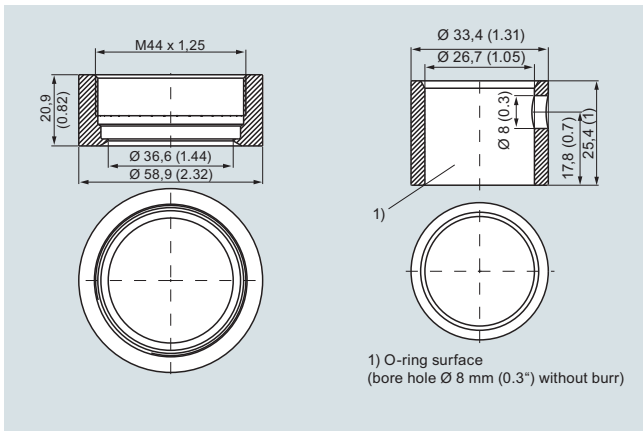
SITRANS P DS III pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

The diagram shows a SITRANS P DS III with an example of a flange. In this drawing the height is subdivided into H<sub>1</sub> and H<sub>2</sub>.

H<sub>1</sub> = Height of the SITRANS P DS III up to a defined cross-section

H<sub>2</sub> = Height of the flange up to this defined cross-section

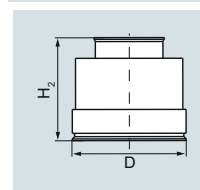
Only the height H<sub>2</sub> is indicated in the dimensions of the flanges.



PMC Style Standard (left) and PMC Style Minibolt (right) weldable sockets, dimensions in mm (inch)

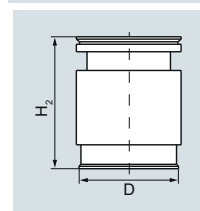
Material: Stainless steel, Mat. No. 1.4404/316L

**PMC Style standard**



DN	PN	ØD	H <sub>2</sub>
		40.9 mm (1.6")	approx. 36.8 mm (1.4")

**PMC Style minibolt**



DN	PN	ØD	H <sub>2</sub>
		26.3 mm (1.0")	approx. 33.1 mm (1.3")

# Pressure Measurement

## Transmitters for gauge pressure for the paper industry

### SITRANS P300 with PMC connection

1

#### Technical specifications

##### SITRANS P300 for gauge pressure with PMC connection for the paper industry

Input																					
Measured variable	Gauge pressure (front-flush)																				
Span (fully adjustable) or measuring range, max. operating pressure and max. test pressure	<table border="1"> <thead> <tr> <th>HART</th> <th>PROFIBUS PA/ FOUNDATION Fieldbus</th> <th>Max. operating pressure MAWP (PS)</th> <th>Max. perm. test pressure</th> </tr> </thead> <tbody> <tr> <td>Span</td> <td>Nominal measuring range</td> <td></td> <td></td> </tr> <tr> <td>0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi</td> <td>1 bar 100 kPa 14.5 psi</td> <td>4 bar 400 kPa 58 psi</td> <td>6 bar 600 kPa 87 psi</td> </tr> <tr> <td>0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi</td> <td>4 bar 400 kPa 58 psi</td> <td>7 bar 0.7 MPa 102 psi</td> <td>10 bar 1 MPa 145 psi</td> </tr> <tr> <td>0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi</td> <td>16 bar 1600 kPa 232 psi</td> <td>21 bar 2.1 MPa 305 psi</td> <td>32 bar 3.2 MPa 464 psi</td> </tr> </tbody> </table>	HART	PROFIBUS PA/ FOUNDATION Fieldbus	Max. operating pressure MAWP (PS)	Max. perm. test pressure	Span	Nominal measuring range			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
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Lower measuring limit (For PMC-Style Minibolt no span < 500 mbar adjustable)	100 mbar a/10 kPa a/1.45 psi a																				
Upper measuring limit	100 % of max. span																				
Output																					
Output signal	<table border="1"> <thead> <tr> <th>HART</th> <th>PROFIBUS PA/ FOUNDATION Fieldbus</th> </tr> </thead> <tbody> <tr> <td>4 ... 20 mA</td> <td>Digital PROFIBUS PA and FOUNDATION Fieldbus signal</td> </tr> <tr> <td>• Lower limit (infinitely adjustable)</td> <td>-</td> </tr> <tr> <td>• Upper limit (infinitely adjustable)</td> <td>-</td> </tr> <tr> <td>Load</td> <td></td> </tr> <tr> <td>• Without HART communication</td> <td>-</td> </tr> <tr> <td>• With HART communication</td> <td>-</td> </tr> <tr> <td>Physical bus</td> <td>IEC 61158-2</td> </tr> <tr> <td>Protection against polarity reversal</td> <td>Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.</td> </tr> <tr> <td>Electrical damping (step width 0.1 s)</td> <td>Set to 2 s (0 ... 100 s)</td> </tr> </tbody> </table>	HART	PROFIBUS PA/ FOUNDATION Fieldbus	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal	• Lower limit (infinitely adjustable)	-	• Upper limit (infinitely adjustable)	-	Load		• Without HART communication	-	• With HART communication	-	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)
HART	PROFIBUS PA/ FOUNDATION Fieldbus																				
4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal																				
• Lower limit (infinitely adjustable)	-																				
• Upper limit (infinitely adjustable)	-																				
Load																					
• Without HART communication	-																				
• With HART communication	-																				
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)																				
• 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 communication	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in $\Omega$ $U_H$ : Power supply in V																				
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)																				
Physical bus	-																				
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																					
Reference conditions	Acc. to IEC 60770-1																				
Measuring span ratio r (spread, Turn-Down)	<ul style="list-style-type: none"> <li>Increasing characteristic</li> <li>Start-of-scale value 0 bar/kPa/psi</li> <li>Stainless steel seal diaphragm</li> <li>Measuring cell with silicone oil</li> <li>Room temperature 25 °C (77 °F)</li> </ul>																				
Error in measurement at limit setting incl. hysteresis and reproducibility	$r = \text{max. measuring span/set measuring span or nom. pressure range}$																				
Linear characteristic																					
- $r \leq 5$	$\leq 0.075 \%$																				
- $5 < r \leq 100$	$\leq (0.005 \cdot r + 0.05) \%$																				
Influence of ambient temperature (in percent per 28 °C (50 °F))	$\leq (0.08 \cdot r + 0.16) \%$																				
Long-term stability (temperature change $\pm 30 \text{ °C}$ ( $\pm 54 \text{ °F}$ ))	$\leq (0.25 \cdot r) \%$ in 5 years																				
Effect of mounting position	$\leq 0.1 \text{ mbar}/0.01 \text{ kPa}/0.00145 \text{ psi}$ 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																				

**SITRANS P300 for gauge pressure with PMC connection for the paper industry****Rated 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)

- 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

Degree of protection

- according to EN 60529

IP65, IP68

- according to NEMA 250

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

-40 ... +100 °C (-40 ... +212 °F)

**Design**

Weight (without options)

Approx. 1 kg (2.2 lb)

Enclosure material

Stainless steel, mat. no. 1.4301/304

Material of parts in contact with the medium

- Seal diaphragm

Hastelloy C276, mat. no. 2.4819

- Measuring cell filling

Silicone oil

Surface quality touched-by-media

Ra-values ≤ 0.8 µm (32 µ inch)/welds Ra ≤ 1.6 µm (64 µ inch)

**Power supply U<sub>H</sub>**

Terminal voltage on transmitter

**HART**10.5 ... 42 V DC  
for intrinsically safe operation:  
10.5 ... 30 V DC**PROFIBUS PA/ FOUNDATION Fieldbus**

Power supply

Supplied through bus

Separate power supply

-

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 ≤ basic current

-

Yes

- Max. fault current in the event of a fault

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

## Pressure Measurement

Transmitters for gauge pressure for the paper industry

### SITRANS P300 with PMC connection

1

#### SITRANS P300 for gauge pressure with PMC connection for the paper industry

Certificates and approvals	HART	PROFIBUS PA/ FOUNDATION Fieldbus
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 05 ATEX 2048	
Marking	II 1/2 G Ex ia IIC/IIB T4/T5/T6 Ga/Gb	
Permissible ambient temperature		
• Temperature class T4	-40 ... +85 °C (-40 ... +185 °F)	
• Temperature class T5	-40 ... +70 °C (-40 ... +158 °F)	
• Temperature class T6	-40 ... +60 °C (-40 ... +140 °F)	
Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$	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: $U_i = 24 \text{ V}$ , $I_i = 250 \text{ mA}$ , $P_i = 1.2 \text{ W}$
Effective inner capacitance:	$C_i = 6 \text{ nF}$	$C_i = 1.1 \text{ nF}$
Effective internal inductance:	$L_i = 0.4 \text{ mH}$	$L_i \leq 7 \mu\text{H}$
Explosion protection to FM for USA <u>and</u> Canada (cFM <sub>US</sub> )		
• Identification (DIP) or (IS): (NI)	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	
• Identification (DIP) or (IS)	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	

# Pressure Measurement

## Transmitters for gauge pressure for the paper industry

### SITRANS P300 with PMC connection

1

<b>HART communication</b>		<b>FOUNDATION Fieldbus communication</b>	
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
<b>PROFIBUS PA communication</b>		- 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 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	One measured value: 5 bytes Two measured values: 10 bytes	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	Register operating mode: 1 bytes Reset function due to metering. 1 bytes	• 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	Linearly rising or falling characteristic	- Can be calibrated by applying two pressures	Yes
- Electrical damping	0 ... 100 s adjustable	- 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
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset and preset Optional direction of counting Simulation function of the register output		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	2		
• Pressure transducer block			
- Monitoring of sensor limits	Yes		
- Specification of a container characteristic with	Max. 31 nodes		
- Characteristic curve	Linear		
- Simulation function	Available		
• Transducer block "Electronic temperature"			
Simulation function	Available		



# Pressure Measurement

Transmitters for gauge pressure for the paper industry

## SITRANS P300 with PMC connection

Selection and Ordering data		Article No.
<b>SITRANS P300 pressure transmitters with PMC connection</b> , single-chamber measuring housing, rating plate inscription in English		
<b>with 4 ... 20 mA / HART</b>	↗	7 MF 8 1 2 3 -
<b>with PROFIBUS PA</b>	↗	7 MF 8 1 2 4 -
<b>with FOUNDATION Fieldbus (FF)</b>	↗	7 MF 8 1 2 5 -
↗ 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>	
Silicone oil	normal	1
Inert liquid	Cleanliness level 2 to DIN 25410	3
<b>Measuring span</b>		
1 bar <sup>1)</sup>	(14.5 psi)	B
4 bar	(58 psi)	C
16 bar	(232 psi)	D
<b>Wetted parts materials</b>		
Seal diaphragm	Measuring cell	
Hastelloy	Stainless steel	B
<b>Process connection</b>		
• PMC Style Standard: Thread 1½"		2
• PMC Style Minibolt: front-flush 1" (minimum span: 500 mbar (7.25 psi), not available with 1-bar-measuring cell (Option B))		3
<b>Non-wetted parts materials</b>		
• Stainless steel, deep-drawn and electrolytically polished		4
<b>Version</b>		
• Standard versions		1
<b>Explosion protection</b>		
• None		A
• With ATEX, Type of protection: - "Intrinsic safety (Ex ia)"		B
• Zone 20/21/22 <sup>2)</sup>		C
• Ex nA/nL (Zone 2) <sup>3)</sup>		E
• With FM + CSA, Type of protection: - "Intrinsic Safe (is)" (planned) <sup>4)</sup>		M
<b>Electrical connection/cable entry</b>		
• Screwed gland M20 x .5 (polyamide) <sup>5)</sup>		A
• Screwed gland M20 x 1.5 (metal)		B
• Screwed gland M20 x 1.5 (stainless steel)		C
• M12 device plug (stainless steel), without cable socket		G
• ½-14 NPT metal thread <sup>6)</sup>		H
• ½-14 NPT stainless steel thread <sup>6)</sup>		J

Selection and Ordering data		Article No.
<b>SITRANS P300 pressure transmitters with PMC connection</b> , single-chamber measuring housing, rating plate inscription in English		
<b>with 4 ... 20 mA / HART</b>		7 MF 8 1 2 3 -
<b>with PROFIBUS PA</b>		7 MF 8 1 2 4 -
<b>with FOUNDATION Fieldbus (FF)</b>		7 MF 8 1 2 5 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
<b>Display</b>		
• Without display, with keys, closed lid		1
• With display and keys, closed lid <sup>7)</sup>		2
• 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
• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc <sup>7)</sup>		5
• With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure unit) <sup>7)</sup>		6
• With display (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane <sup>7)</sup>		7

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

Included in delivery of the device:

- Quick-start guide
- Sealing ring

- 1) Only with "Standard" process connection"
- 2) Not in conjunction with electrical connection option A.
- 3) Only available together with electrical connection options B, C or G.
- 4) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 5) Only together with HART electronics.
- 6) Without cable gland.
- 7) Display cannot be turned.

## Pressure Measurement

### Transmitters for gauge pressure for the paper industry

#### SITRANS P300 with PMC connection

1

Selection and Ordering data	Order code			
<b>Further designs</b>		<b>HART</b>	<b>PA</b>	<b>FF</b>
Add "-Z" to Article No. and specify Order code.				
<b>Cable socket for M12 device plugs</b>				
• Stainless steel	<b>A51</b>	✓	✓	✓
<b>Rating plate inscription</b> (instead of English)				
• German	<b>B10</b>	✓	✓	✓
• French	<b>B12</b>	✓	✓	✓
• Spanish	<b>B13</b>	✓	✓	✓
• Italian	<b>B14</b>	✓	✓	✓
<b>English rating plate</b>	<b>B21</b>	✓	✓	✓
Pressure units in inH <sub>2</sub> O and/or psi				
<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>	<b>C11</b>	✓	✓	✓
<b>Inspection certificate</b> Acc. to EN 10204-3.1	<b>C12</b>	✓	✓	✓
<b>Factory certificate</b> Acc. to EN 10204-2.2	<b>C14</b>	✓	✓	✓
<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	<b>D05</b>	✓	✓	✓
<b>Degree of protection IP65/IP68</b> (only for M20x1.5 and ½-14 NPT)	<b>D12</b>	✓	✓	✓
<b>Mounting</b>				
• Weldable sockets for standard 1½" threaded connection	<b>P01</b>	✓	✓	✓
• Weldable socket for minibolt connection 1" (incl. screw 5/16-18 UNC-2B and washer)	<b>P02</b>	✓	✓	✓

Selection and Ordering data	Order code			
<b>Additional data</b>		<b>HART</b>	<b>PA</b>	<b>FF</b>
Please add "-Z" to Article No. and specify Order code(s) and plain text.				
<b>Measuring range to be set</b>	<b>Y01</b>	✓	✓ <sup>1)</sup>	
Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi				
<b>Stainless steel tag plate and entry in device variable (measuring point description)</b>	<b>Y15</b>	✓	✓	✓
Max. 16 characters, specify in plain text: Y15: .....				
<b>Measuring point text (entry in device variable)</b>	<b>Y16</b>	✓	✓	✓
Max. 27 char., specify in plain text: Y16: .....				
<b>Entry of HART address (TAG)</b>	<b>Y17</b>	✓		
Max. 8 char., specify in plain text: Y17: .....				
<b>Setting of pressure indication in pressure units</b>	<b>Y21</b>	✓	✓	✓
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				
<b>Setting of pressure indication in non-pressure units<sup>2)</sup></b>	<b>Y22 + Y01</b>	✓		
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>Preset bus address</b>	<b>Y25</b>		✓	✓
possible between 1 and 126 Specify in plain text: Y25: .....				
Only "Y01" and "Y21" can be factory preset				

✓ = available

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

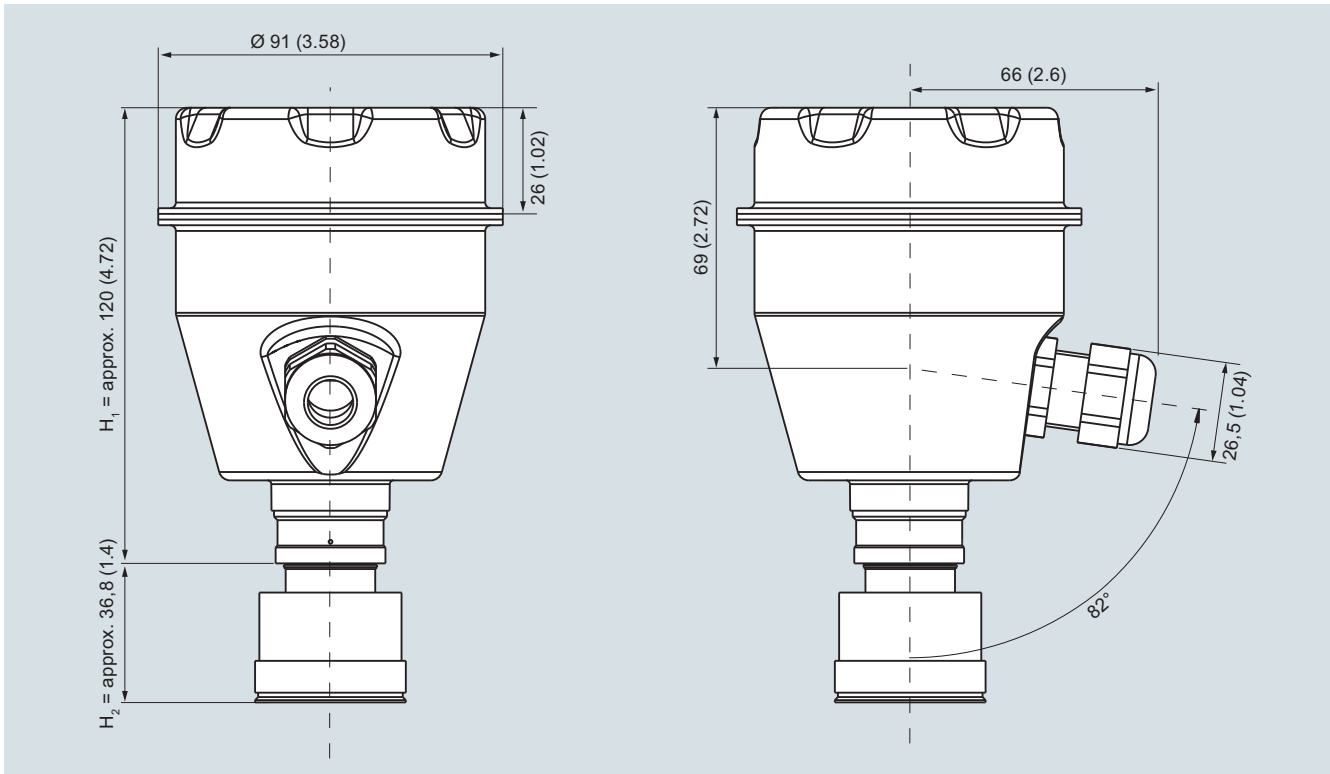
<sup>2)</sup> Preset values can only be changed over SIMATIC PDM.

## Pressure Measurement

Transmitters for gauge pressure for the paper industry

### SITRANS P300 with PMC connection

#### Dimensional drawings



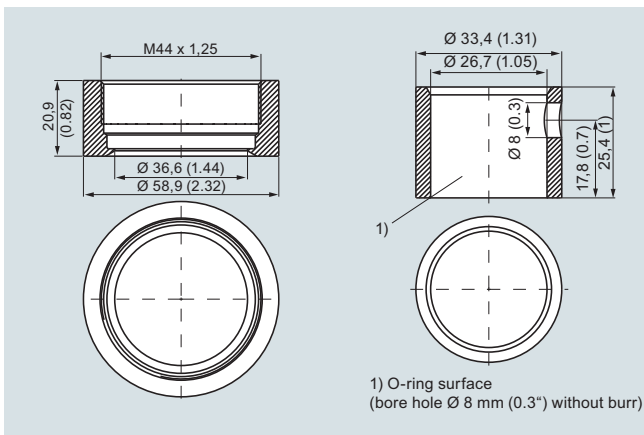
SITRANS P300 pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

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

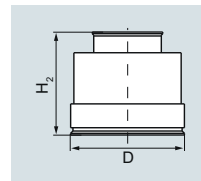
Only the height  $H_2$  is indicated in the dimensions of the flanges.



PMC Style Standard (left) and PMC Style Minibolt (right) weldable sockets, dimensions in mm (inch)

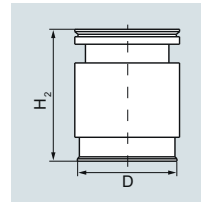
Material: Stainless steel, mat. No. 1.4404 / 316L

#### PMC Style Standard



DN	PN	ØD	$H_2$
		40.4 mm (1.6")	Approx. 36.8 mm (1.4")

#### PMC Style Mini bolt



DN	PN	ØD	$H_2$
		26.3 mm (1.0")	Approx. 33.1 mm (1.3")