

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

## Technical specifications

### SITRANS P, DS III for differential pressure and flow

#### Input

Measured variable

Differential pressure and flow

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	Max. operating pressure MAWP (PS)
Span	Nominal measuring range	
1 ... 20 mbar 0.1 ... 2 kPa 0.4 ... 8 inH <sub>2</sub> O	20 mbar 2 kPa 8 inH <sub>2</sub> O	32 bar 3.2 MPa 464 psi
1 ... 60 mbar 0.1 ... 6 kPa 0.4 ... 24 inH <sub>2</sub> O	60 mbar 6 kPa 24.1 inH <sub>2</sub> O	160 bar 16 MPa 2320 psi
2.5 ... 250 mbar 0.2 ... 25 kPa 1 ... 100 inH <sub>2</sub> O	250 mbar 25 kPa 100 inH <sub>2</sub> O	
6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH <sub>2</sub> O	600 mbar 60 kPa 240 inH <sub>2</sub> O	
16 ... 1600 mbar 1.6 ... 160 kPa 6.4 ... 642 inH <sub>2</sub> O	1600 mbar 160 kPa 642 inH <sub>2</sub> O	
50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH <sub>2</sub> O	5000 mbar 500 kPa 2000 inH <sub>2</sub> O	
0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi	
2.5 ... 250 mbar 0.2 ... 25 kPa 1 ... 100 inH <sub>2</sub> O	250 mbar 25 kPa 100 inH <sub>2</sub> O	420 bar 42 MPa 6091 psi
6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH <sub>2</sub> O	600 mbar 60 kPa 240 inH <sub>2</sub> O	(500 bar/50 MPa/7250 psi can be ordered optionally with Order Code D56)
16 ... 1600 mbar 1.6 ... 160 kPa 6.4 ... 642 inH <sub>2</sub> O	1600 mbar 160 kPa 642 inH <sub>2</sub> O	
50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH <sub>2</sub> O	5000 mbar 500 kPa 2000 inH <sub>2</sub> O	
0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi	
		-100 % of max. span (-33 % with measuring cell 30 bar/3 MPa/435 psi) or 30 mbar a/3 kPa a/0.44 psi a
		-100 % of max. span (-33 % with measuring cell 30 bar/3 MPa/435 psi) or 30 mbar a/3 kPa a/0.44 psi a
		30 mbar a + 20 mbar a · (θ - 60 °C)/°C 3 kPa a + 2 kPa a · (θ - 60 °C)/°C 0.44 psi a + 0.29 psi a · (θ - 140 °F)/°F
		100 % of max. span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/process temperature)
		Between the measuring limits (fully adjustable)

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
  - for process temperature -20 °C < θ ≤ +60 °C (-4 °F < θ ≤ +140 °F)
  - 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 measuring cell 435 psi))

Upper measuring limit

Start of scale value

SITRANS P, DS III for differential pressure and flow		
Output	HART	PROFIBUS PA/FOUNDATION Fieldbus
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
<ul style="list-style-type: none"> <li>Lower limit (infinitely adjustable)</li> <li>Upper limit (infinitely adjustable)</li> </ul>	3.55 mA, factory preset to 3.84 mA  23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA (with order code D05)	-
Load		
<ul style="list-style-type: none"> <li>Without HART</li> <li>With HART</li> </ul>	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$ $U_H$ : Power supply in V  $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)	-
Physical bus	-	IEC 61158-2
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.	
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)	
<b>Measuring accuracy</b>	Acc. to IEC 60770-1	
Reference conditions (All error data refer always refer to the set span)	<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>Silicone oil filling</li> <li>Room temperature 25 °C (77 °F)</li> </ul>	
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nom. pressure range	
Error in measurement at limit setting incl. hysteresis and reproducibility		
<ul style="list-style-type: none"> <li>Linear characteristic</li> </ul>		
- 20 mbar/2 kPa/0.29 psi	$r \leq 5 :$ $\leq 0.075 \%$ $5 < r \leq 10 :$ $\leq (0.0029 \cdot r + 0.071) \%$ $10 < r \leq 20 :$ $\leq (0.0045 \cdot r + 0.071) \%$	
- 60 mbar/6 kPa/0.87 psi	$r \leq 5 :$ $\leq 0.075 \%$ $5 < r \leq 60 :$ $\leq (0.005 \cdot r + 0.05) \%$	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5 :$ $\leq 0.065 \%$ $5 < r \leq 100 :$ $\leq (0.004 \cdot r + 0.045) \%$	
<ul style="list-style-type: none"> <li>Square-rooted characteristic (flow &gt; 50 %)</li> </ul>		
- 20 mbar/2 kPa/0.29 psi	$r \leq 5 :$ $\leq 0.075 \%$ $5 < r \leq 10 :$ $\leq (0.0029 \cdot r + 0.071) \%$ $10 < r \leq 20 :$ $\leq (0.0045 \cdot r + 0.071) \%$	
- 60 mbar/6 kPa/0.87 psi	$r \leq 5 :$ $\leq 0.075 \%$ $5 < r \leq 60 :$ $\leq (0.005 \cdot r + 0.05) \%$	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5 :$ $\leq 0.065 \%$ $5 < r \leq 100 :$ $\leq (0.004 \cdot r + 0.045) \%$	
<ul style="list-style-type: none"> <li>Square-rooted characteristic (flow &gt; 25 ... 50 %)</li> </ul>		
- 20 mbar/2 kPa/0.29 psi	$r \leq 5 :$ $\leq 0.15 \%$ $5 < r \leq 10 :$ $\leq (0.0058 \cdot r + 0.142) \%$ $10 < r \leq 20 :$ $\leq (0.009 \cdot r + 0.142) \%$	
- 60 mbar/6 kPa/0.87 psi	$r \leq 5 :$ $\leq 0.015 \%$ $5 < r \leq 60 :$ $\leq (0.01 \cdot r + 0.1) \%$	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5 :$ $\leq 0.13 \%$ $5 < r \leq 100 :$ $\leq (0.008 \cdot r + 0.09) \%$	

# Pressure Measurement

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

## for differential pressure and flow

1

### SITRANS P, DS III for differential pressure and flow

<b>Measuring accuracy</b> (continued)	Acc. IEC 60770-1
Influence of ambient temperature (in percent per 28 °C (50 °F))	
• 20 mbar/2 kPa/0.29 psi	$\leq (0.15 \cdot r + 0.1) \%$
• 60 mbar/6 kPa/0.87 psi	$\leq (0.075 \cdot r + 0.1) \%$
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$\leq (0.025 \cdot r + 0.125) \%$
Influence of static pressure	
• on the zero point	
- 20 mbar/2 kPa/0.29 psi	$\leq (0.15 \cdot r) \%$ per 32 bar (zero offset is possible with position error adjustment)
- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi	$\leq (0.1 \cdot r) \%$ per 70 bar (zero offset is possible with position error adjustment)
- 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$\leq (0.2 \cdot r) \%$ per 70 bar (zero offset is possible with position error adjustment)
• on the span	
- 20 mbar/2 kPa/0.29 psi	$\leq 0.2 \%$ per 32 bar
- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$\leq 0.14 \%$ per 70 bar
Long-term stability (temperature change $\pm 30$ °C ( $\pm 54$ °F))	Static pressure max. 70 bar/7 MPa/ 1015 psi
• 20 mbar/2 kPa/0.29 psi	$\leq (0.2 \cdot r) \%$ per year
• 60 mbar/6 kPa/0.87 psi 30 bar/3 MPa/435 psi	$\leq (0.25 \cdot r) \%$ in 5 years
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi	$\leq (0.125 \cdot r) \%$ in 5 years
Effect of mounting position (in pressure per change in angle)	$\leq 0.7$ mbar/0.07 kPa/0.028 inH <sub>2</sub> O per 10° inclination (zero offset is possible with position error adjustment)
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range

**SITRANS P, DS III for differential pressure and flow****Rated conditions**

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling

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

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

-20 ... +100 °C (-4 ... +212 °F)

-10 ... +100 °C (+14 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- Ambient temperature (silicone oil and inert oil)

- Transmitter

-40 ... +85 °C (-40 ... +185 °F)

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

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Ambient temperature (Neobee fill fluid)

- Transmitter

-10 ... +85 °C (+14 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

- Climatic class

- Condensation

Relative humidity 0 ... 100 %

Condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

**Design**

Weight (without options)

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

Enclosure material

Low-copper die-cast aluminum, GD-AISI12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

- Seal diaphragm

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold

- Process flanges and sealing screw

Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602 or Monel, mat. no. 2.4360

- O-Ring

FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR

Measuring cell filling

Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))

Process connection

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

Material of mounting bracket

- Steel
- Stainless steel 304
- Stainless steel 316L

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

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

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

**Power supply  $U_H$** 

Terminal voltage on transmitter

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

-

Power supply

-

Supplied through bus

Separate 24 V power supply necessary

-

No

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

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

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

# Pressure Measurement

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

for differential pressure and flow

1

## SITRANS P, DS III for differential pressure and flow

### Certificates and approvals

Classification according to PED 2014/68/EU

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

- Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

- Dust explosion protection for zone 20

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

- Effective internal inductance/capacitance

- Dust explosion protection for zone 21/22

- Marking
- Connection

- Type of protection "n" (zone 2)

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

- Effective internal inductance/capacitance

- Explosion protection acc. to FM

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

- Explosion protection to CSA

- Identification (XP/DIP) or (IS)

### HART

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

PTB 13 ATEX 2007 X

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

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;  
-40 ... +70 °C (-40 ... +158 °F) temperature class T5;  
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

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

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

PTB 99 ATEX 1160

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

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

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

PTB 01 ATEX 2055

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

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

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

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

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

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

PTB 13 ATEX 2007 X

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

$U_m = 45 \text{ V}$

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

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

Certificate of Compliance 3008490

CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III

Certificate of Compliance 1153651

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

### PROFIBUS PA/ FOUNDATION Fieldbus

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

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

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

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

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

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

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

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

$U_m = 32 \text{ V}$

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

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

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

<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 PC	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

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

1

for differential pressure and flow

Selection and Ordering data		Article No.
<b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi)</b>		<b>7MF4433-</b>
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>		
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>	
Silicone oil	normal	1
Inert liquid <sup>1)</sup>	grease-free to cleanliness level 2	3
FDA compliant fill fluid <sup>2)</sup>		
• Neobee oil	normal	4
<b>Measuring span (min. ... max.)</b>		
PN 32 (MAWP 464 psi)		
1 ... 20 mbar <sup>3)</sup>	(0.4 ... 8 inH <sub>2</sub> O)	B
PN 160 (MAWP 2320 psi)		
1 ... 60 mbar	(0.4 ... 24 inH <sub>2</sub> O)	C
2.5 ... 250 mbar	(1.004 ... 100.4 inH <sub>2</sub> O)	D
6 ... 600 mbar	(2.4 ... 240 inH <sub>2</sub> O)	E
16 ... 1600 mbar	(6.4 ... 642 inH <sub>2</sub> O)	F
50 ... 5000 mbar	(20 ... 2000 inH <sub>2</sub> O)	G
0.3 ... 30 bar	(4.35 ... 435 psi)	H
<b>Wetted parts materials</b>		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Tantalum <sup>4)</sup>	Tantalum	E
Monel <sup>4)</sup>	Monel	H
Gold <sup>4)</sup>	Gold	L
Version for diaphragm seal <sup>5) 6) 7) 8)</sup>		Y
<b>Process connection</b>		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		2
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		0
• Vent on side of process flange <sup>3)</sup>		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		6
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		4
<b>Non-wetted parts materials</b>		
process flange screws	Electronics housing	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting <sup>9)</sup>	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.		

Selection and Ordering data		Article No.
<b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi)</b>		<b>7MF4433-</b>
<b>Explosion protection</b>		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
- "Explosion-proof (Ex d)" <sup>10)</sup>		D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" <sup>11)</sup>		P
- "Ex nA/ic (Zone 2)" <sup>12)</sup>		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)" <sup>11)13)</sup>		R
• FM + CSA intrinsic safe (is) <sup>14)</sup>		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>11)13)14)</sup>		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)" <sup>10)14)</sup>		NC
<b>Electrical connection/cable entry</b>		
• Screwed gland M20 x 1.5		B
• Screwed gland 1/2-14 NPT		C
• Device plug Han 7D (plastic housing) incl. mating connector <sup>15)16)</sup>		D
• Device plugs M12 (stainless steel) <sup>17)18)</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" or "Y22" required)		7
Power supply units see Chap. 7 "Supplementary Components".		
Included in delivery of the device:		
• Quick-start guide		
• Sealing plug(s) or sealing screw(s) for the process flanges(s)		
<sup>1)</sup> For oxygen application, add Order code E10. <sup>2)</sup> Available for measuring ranges 250 mbar ... 5 bar. <sup>3)</sup> Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing). <sup>4)</sup> Not in conjunction with max. span 20 and 60 mbar (8.03 and 24.09 inH <sub>2</sub> O)) <sup>5)</sup> When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here. <sup>6)</sup> 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. <sup>7)</sup> The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443-..Y-.... and 7MF4900-1...-B <sup>8)</sup> The standard measuring cell filling for configurations with remote seals (Y) is silicone oil. <sup>9)</sup> Not in conjunction with Electrical connection "device plug Han 7D". <sup>10)</sup> Without cable gland, with blanking plug <sup>11)</sup> With enclosed cable gland Ex ia and blanking plug <sup>12)</sup> Configurations with device plugs Han and M12 are only available in Ex ic. <sup>13)</sup> Only in connection with IP66. <sup>14)</sup> Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505. <sup>15)</sup> Only in connection with Ex approval A, B or E. <sup>16)</sup> Permissible only for crimp-contact of conductor cross-section 1 mm <sup>2</sup> <sup>17)</sup> Only in connection with Ex approval A, B, E or F. <sup>18)</sup> M12 delivered without cable socket.		





# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

Selection and Ordering data	Order code			Selection and Ordering data	Order code		
<i>Further designs</i> Add "-Z" to Article No. and specify Order code.	HART	PA	FF	<i>Further designs</i> Add "-Z" to Article No. and specify Order code.	HART	PA	FF
<b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>				<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓	
• Steel	A01	✓	✓	<b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b> (only together with seal diaphragm made of Hastelloy and stainless steel)	D07	✓	✓
• Stainless steel 304	A02	✓	✓	<b>Degree of protection IP66/IP68</b> (only for M20 x 1.5 and ½-14 NPT)	D12	✓	✓
• Stainless steel 316L	A03	✓	✓	<b>Process flange screws made of Monel</b> (max. nominal pressure PN20)	D34	✓	✓
<b>O-rings for process flanges</b> (instead of FPM (Viton))				<b>Supplied with oval flange set</b> (2 items), PTFE packings and screws in thread of process flanges	D37	✓	✓
• PTFE (Teflon)	A20	✓	✓	<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	D59	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	<b>Use in or on zone 1D/2D<sup>5)</sup></b> (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia)" and IP66)	E01	✓	✓
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	<b>Overfilling safety device for flammable and non-flammable liquids</b> (max. PN 32 (MAWP 464 psi), basic device with type of protection "Intrinsic safety (Ex ia)", to WHG and VbF, not together with measuring cell filling "inert liquid")	E08	✓	
• NBR (Buna N)	A23	✓	✓	<b>Oxygen application</b> (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))	E10	✓	✓
<b>Device plugs<sup>1)</sup></b>				<b>Export approval Korea</b>	E11	✓	✓
• Han 7D (metal)	A30	✓		<b>CRN approval Canada</b> (Canadian Registration Number)	E22 <sup>6)</sup>	✓	✓
• Han 8D (instead of Han 7D)	A31	✓		<b>Dual seal</b>	E24	✓	✓
• Angled	A32	✓		<b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-B..)	E25 <sup>7)</sup>	✓	✓
• Han 8D (metal)	A33	✓		<b>"Flameproof" explosion protection according to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-D..)	E26 <sup>7)</sup>	✓	✓
<b>Sealing screws (2 units)</b> ¼-18 NPT, with valve in mat. of process flanges	A40	✓	✓	<b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-P..)	E28 <sup>7)</sup>	✓	✓
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	A50	✓	✓	<b>Ex Approval IEC Ex (Ex ia)</b> (only for transmitter 7MF4...-.....-B..)	E45 <sup>7)</sup>	✓	✓
<b>Rating plate inscription</b> (instead of German)				<b>Ex Approval IEC Ex (Ex d)</b> (only for transmitter 7MF4...-.....-D..)	E46 <sup>7)</sup>	✓	✓
• English	B11	✓	✓	<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-B..)	E55 <sup>7)</sup>	✓	✓
• French	B12	✓	✓	<b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-D..)	E56 <sup>7)</sup>	✓	✓
• Spanish	B13	✓	✓	<b>Explosion-proof "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-E..)	E57 <sup>7)</sup>	✓	✓
• Italian	B14	✓	✓	<b>Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China)</b> (only for transmitter 7MF4...-.....-R..)	E58 <sup>7)</sup>	✓	✓
• Italian	B14	✓	✓	<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 <sup>7)</sup>	✓	✓
• Cyrillic (russian)	B16	✓	✓				
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓				
<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<sup>2)</sup></b>	C11	✓	✓				
<b>Inspection certificate<sup>3)</sup> to EN 10204-3.1</b>	C12	✓	✓				
<b>Factory certificate to EN 10204-2.2</b>	C14	✓	✓				
<b>Acceptance certificate (EN 10204-3.1)</b> PMI test of parts in contact with medium	C15	✓	✓				
<b>Functional safety (SIL2)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓					
<b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>	C21 <sup>4)</sup>		✓				
<b>Functional safety (SIL2/3)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓					
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓				

Selection and Ordering data	Order code	HART	PA	FF	Selection and Ordering data	Order code	HART	PA	FF
<b>Further designs</b> Add "-Z" to Article No. and specify Order code.					<b>Additional data</b> Please add "-Z" to Article No. and specify Order code(s) and plain text.				
<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	E80	✓	✓	✓	<b>Measuring range to be set</b> Specify in plain text:				
<b>Ex-protection Ex d according to EAC Ex (Russia)</b>	E81	✓	✓	✓	• in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓	✓ <sup>1)</sup>	
<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>	E82	✓	✓	✓	• in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	Y02	✓		
<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>	E83	✓	✓	✓	<b>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	Y15	✓	✓	✓
<b>Two coats of lacquer on casing and cover (PU on epoxy)</b>	G10	✓	✓	✓	<b>Measuring point text (entry in device variable)</b> Max. 27 char., specify in plain text: Y16: .....	Y16	✓	✓	✓
<b>Interchanging of process connection side</b>	H01	✓	✓	✓	<b>Entry of HART address (TAG)</b> Max. 8 char., specify in plain text: Y17: .....	Y17	✓		
<b>Vent on side for gas measurements</b>	H02	✓	✓	✓	<b>Setting of pressure indicator 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>Stainless steel process flanges for vertical differential pressure lines (not together with K01, K02 and K04<sup>8)</sup>)</b>	H03	✓	✓	✓	<b>Setting of pressure indicator in non-pressure units<sup>2)</sup></b> Specify in plain text: Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)	Y22 <sup>3)</sup> + Y01 or Y02	✓		
<b>Transient protector 6 kV (lightning protection)</b>	J01	✓	✓	✓	<b>Preset bus address</b> possible between 1 and 126 Specify in plain text: Y25: .....	Y25		✓	✓
<b>Chambered graphite gasket for process flange</b>	J02	✓	✓	✓	<b>Damping adjustment in seconds (0 ... 100 s)</b> Factory mounting of valve manifolds, see accessories. Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset ✓ = available	Y30	✓	✓	✓
<b>Chambered PTFE graphite gasket</b>	J03	✓	✓	✓					
<b>EPDM O-rings for process flange with approval (WRC/WRAS)</b>	J05	✓	✓	✓					
<b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display<sup>9)</sup>)</b>	J08	✓	✓	✓					
<b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display<sup>9)</sup>)</b>	J09	✓	✓	✓					
<b>Process flange</b>									
• Hastelloy	K01	✓	✓	✓					
• Monel	K02	✓	✓	✓					
• Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi), max. temperature of medium 90 °C (194 °F), for ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible	K04	✓	✓	✓					
<b>Marine approvals</b>									
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓	✓					
• Lloyds Register (LR)	S11	✓	✓	✓					
• French marine classification society Bureau Veritas (BV)	S12	✓	✓	✓					
• American Bureau of Shipping (ABS)	S14	✓	✓	✓					
• Russian Maritime Register (RMR)	S16	✓	✓	✓					
• Korean Register of Shipping (KR)	S17	✓	✓	✓					

Factory mounting of valve manifolds, see accessories.

✓ = available

- Device plug Han IP65
- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H
- Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.
- Cannot be ordered with remote seal.
- 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.
- Not suitable for connection of remote seal.
- Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

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

# Pressure Measurement

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

1

for differential pressure and flow

Selection and Ordering data		Article No.
<b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>		<b>7MF4533-</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 <sup>1)</sup>	grease-free to cleanliness level 2	3
<b>Measuring span (min. ... max.)</b>		
2.5 ... 250 mbar	(1.004 ... 100 inH <sub>2</sub> O)	D
6 ... 600 mbar	(2.4 ... 240 inH <sub>2</sub> O)	E
16 ... 1600 mbar	(6.4 ... 642 inH <sub>2</sub> O)	F
50 ... 5000 mbar	(20 ... 2000 inH <sub>2</sub> O)	G
0.3 ... 30 bar	(4.35 ... 435 psi)	H
<b>Wetted parts materials</b> (stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Gold <sup>2)</sup>	Gold	L
Version for diaphragm seal <sup>3) 4) 5) 6)</sup>		Y
<b>Process connection</b>		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		3
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		1
• Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing)		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		7
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		5
<b>Non-wetted parts materials</b>		
process flange screws	Electronics housing	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting <sup>7)</sup>	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>8)</sup>		D
- "Intrinsic safety and flameproof enclosure (Ex ia + Ex d)" <sup>9)</sup>		P
- "Ex nA/ic (Zone 2)" <sup>10)</sup>		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)" <sup>9)11)</sup>		R
• FM + CSA intrinsic safe (is) <sup>12)</sup>		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>9)11)12)</sup>		S
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)" <sup>8)12)</sup> , max PN 360		NC

Selection and Ordering data		Article No.
<b>SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>		<b>7MF4533-</b>
<b>Electrical connection/cable entry</b>		
• Screwed gland M20x1.5		B
• Screwed gland 1/2-14 NPT		C
• Device plug Han 7D (plastic housing) incl. mating connector <sup>13)14)</sup>		D
• Device plugs M12 (stainless steel) <sup>15) 16)</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" or "Y22" required)		7
Power supply units see Chap. 7 "Supplementary Components".		
Scope of delivery: Pressure transmitter as ordered (Instruction Manual is extra ordering item)		
1) For oxygen application, add Order code E10.		
2) Not in conjunction with max. span 600 mbar (240.9 inH <sub>2</sub> O)		
3) When the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.		
4) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
5) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF453-...Y-... and 7MF4900-1-...-B		
6) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.		
7) Not in conjunction with Electrical connection "device plug Han 7D".		
8) Without cable gland, with blanking plug		
9) With enclosed cable gland Ex ia and blanking plug		
10) Configurations with device plugs Han and M12 are only available in Ex ic.		
11) Only in connection with IP66.		
12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
13) Only in connection with Ex approval A, B or E.		
14) Permissible only for crimp-contact of conductor cross-section 1 mm <sup>2</sup>		
15) Only in connection with Ex approval A, B, E or F.		
16) M12 delivered without cable socket.		

**Pressure Measurement**

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

Selection and Ordering data		Article No.
<b>Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>		
SITRANS P DS III with PROFIBUS PA (PA)		7 MF 4 5 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 MF 4 5 3 5 -
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>		
<b>Measuring cell filling</b>	<b>Measuring cell cleaning</b>	
Silicone oil	normal	1
Inert liquid <sup>1)</sup>	grease-free to cleanliness level 2	3
<b>Nominal measuring range</b>		
250 mbar	(100 inH <sub>2</sub> O)	D
600 mbar	(240 inH <sub>2</sub> O)	E
1600 mbar	(642 inH <sub>2</sub> O)	F
5 bar	(2000 inH <sub>2</sub> O)	G
30 bar	(435 psi)	H
<b>Wetted parts materials</b>		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Gold <sup>2)</sup>	Gold	L
Version for diaphragm seal <sup>3) 4) 5) 6)</sup>		Y
<b>Process connection</b>		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		
• Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing).		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		
3		
1		
7		
5		
<b>Non-wetted parts materials</b>		
Process flange screws		
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting	3
<b>Version</b>		
• Standard version, German plate inscription, setting for pressure unit: bar		
• International version, English plate inscription, setting for pressure unit: bar		
• Chinese version, English plate inscription, setting for pressure unit: Pascal		
All versions include DVD with compact operating instructions in various EU languages.		
1		
2		
3		

Selection and Ordering data		Article No.
<b>Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>		
SITRANS P DS III with PROFIBUS PA (PA)		7 MF 4 5 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 MF 4 5 3 5 -
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>		
<b>Explosion protection</b>		
• None		
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		
- "Explosion-proof (Ex d)" <sup>7)</sup>		
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) <sup>8)</sup>		
- "Ex nA/ic (Zone 2)" <sup>9)</sup>		
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>8) 10)</sup>		
• FM + CSA intrinsic safe (is) <sup>11)</sup>		
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX)+ Zone 1D/2D <sup>9) 10) 11)</sup>		
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)" <sup>7) 11)</sup> , max PN 360		
<b>Electrical connection/cable entry</b>		
• Screwed gland M20 x 1.5		
• Screwed gland 1/2-14 NPT		
• Device plugs M12 (stainless steel) <sup>12) 13)</sup>		
<b>Display</b>		
• Without (display hidden)		
• Without visible display (display concealed, setting: bar)		
• With visible display (setting: bar)		
• With customer-specific display (setting as specified, Order code "Y21" required)		
0		
1		
6		
7		
Included in delivery of the device:		
• Quick-start guide		
• Sealing plug(s) or sealing screw(s) for the process flanges(s)		
1) For oxygen application, add Order code E10.		
2) Not in conjunction with max. span 600 mbar (240.9 inH <sub>2</sub> O)		
3) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here.		
4) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
5) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF453.-.Y.-... and 7MF4900-1.-.-B		
6) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.		
7) Without cable gland, with blanking plug.		
8) With enclosed cable gland Ex ia and blanking plug.		
9) Configurations with device plugs Han and M12 are only available in Ex ic.		
10) Only in connection with IP66.		
11) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
12) Only in connection with Ex approval A, B, E or F.		
13) M12 delivered without cable socket		

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

Selection and Ordering data	Order code			Selection and Ordering data	Order code				
<b>Further designs</b> Add "-Z" to Article No. and specify Order code.		HART	PA	FF	<b>Setting of the upper saturation limit of the output signal to 22.0 mA</b>	D05	✓		
<b>Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:</b>					<b>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b> (only together with seal diaphragm made of Hastelloy and stainless steel)	D07	✓	✓	✓
• Steel	A01	✓	✓	✓	<b>Degree of protection IP66/IP68</b> (only for M20 x 1.5 and ½-14 NPT)	D12	✓	✓	✓
• Stainless steel 304	A02	✓	✓	✓	<b>Nom. press. rating PN 500 (MAWP 7250 psi)</b> (Only for measuring cell 600 mbar ... 30 bar (240 inH <sub>2</sub> O ... 435 psi), SIL- and Ex-options not possible) <sup>3)</sup>	D56	✓		
• Stainless steel 316L	A03	✓	✓	✓	<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	D59	✓	✓	✓
<b>O-rings for process flanges</b> (instead of FPM (Viton))					<b>Use in or on zone 1D/2D<sup>4)</sup></b> (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia)" and IP66)	E01	✓	✓	✓
• PTFE (Teflon)	A20	✓	✓	✓	<b>Export approval Korea</b>	E11	✓	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	✓	<b>CRN approval Canada</b> (Canadian Registration Number)	E22 <sup>5)</sup>	✓	✓	✓
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	✓	<b>Dual seal</b>	E24	✓	✓	✓
• NBR (Buna N)	A23	✓	✓	✓	<b>Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-B..)	E25 <sup>6)</sup>	✓	✓	✓
<b>Device plugs<sup>1)</sup></b>					<b>"Flameproof" explosion protection according to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-D..)	E26 <sup>6)</sup>	✓	✓	✓
• Han 7D (metal)	A30	✓			<b>Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)</b> (only for transmitter 7MF4...-.....-P..)	E28 <sup>6)</sup>	✓	✓	
• Han 8D (instead of Han 7D)	A31	✓			<b>Ex Approval IEC Ex (Ex ia)</b> (only for transmitter 7MF4...-.....-B..)	E45 <sup>6)</sup>	✓	✓	✓
• Angled	A32	✓			<b>Ex Approval IEC Ex (Ex d)</b> (only for transmitter 7MF4...-.....-D..)	E46 <sup>6)</sup>	✓	✓	✓
• Han 8D (metal)	A33	✓			<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-B..)	E55 <sup>6)</sup>	✓	✓	✓
<b>Sealing screws (2 units)</b> ¼-18 NPT, with valve in mat. of process flanges	A40	✓	✓	✓	<b>Ex prot. "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-D..)	E56 <sup>6)</sup>	✓	✓	✓
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	A50	✓	✓	✓	<b>Explosion-proof "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-E..)	E57 <sup>6)</sup>	✓	✓	✓
<b>Rating plate inscription</b> (instead of German)					<b>Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-.....-R..)	E58 <sup>6)</sup>	✓	✓	✓
• English	B11	✓	✓	✓	<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 <sup>6)</sup>	✓	✓	✓
• French	B12	✓	✓	✓	<b>Ex-protection Ex ia acc. to EAC Ex (Russia)</b>	E80	✓	✓	✓
• Spanish	B13	✓	✓	✓	<b>Ex-protection Ex d acc. to EAC Ex (Russia)</b>	E81	✓	✓	✓
• Italian	B14	✓	✓	✓	<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>	E82	✓	✓	✓
• Cyrillic (russian)	B16	✓	✓	✓	<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>	E83	✓	✓	✓
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓	✓					
<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2</b>	C11	✓	✓	✓					
<b>Inspection certificate</b> Acc. to EN 10204-3.1	C12	✓	✓	✓					
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	✓					
<b>Acceptance certificate (EN 10204-3.1)</b> PMI test of parts in contact with medium	C15	✓	✓	✓					
<b>Functional safety (SIL2)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓							
<b>Functional safety (PROFIsafe) Certificate and PROFIsafe protocol</b>	C21 <sup>2)</sup>		✓						
<b>Functional safety (SIL2/3)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓							
<b>PED for Russia with initial calibration mark</b>	C99	✓	✓	✓					

Selection and Ordering data	Order code		
<i>Further designs</i>	HART	PA	FF
Add "-Z" to Article No. and specify Order code.			
<b>Two coats of lacquer on casing and cover (PU on epoxy)</b>	<b>G10</b>	✓	✓
<b>Interchanging of process connection side</b>	<b>H01</b>	✓	✓
<b>Stainless steel process flanges for vertical differential pressure lines</b>	<b>H03</b>	✓	✓
<b>Transient protector 6 kV (lightning protection)</b>	<b>J01</b>	✓	✓
<b>Chambered graphite gasket for process flange</b>	<b>J02</b>	✓	✓
<b>EPDM O-rings for process flange with approval (WRC/WRAS)</b>	<b>J05</b>	✓	✓
<b>Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)<sup>7)</sup></b>	<b>J08</b>	✓	✓
<b>Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)<sup>7)</sup></b>	<b>J09</b>	✓	✓
<b>Marine approvals</b>			
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	<b>S10</b>	✓	✓
• Lloyds Register (LR)	<b>S11</b>	✓	✓
• French marine classification society Bureau Veritas (BV)	<b>S12</b>	✓	✓
• American Bureau of Shipping (ABS)	<b>S14</b>	✓	✓
• Russian Maritime Register (RMR)	<b>S16</b>	✓	✓
• Korean Register of Shipping (KR)	<b>S17</b>	✓	✓

Selection and Ordering data	Order code		
<i>Additional data</i>	HART	PA	FF
Please add "-Z" to Article No. and specify Order code(s) and plain text.			
<b>Measuring range to be set</b>			
Specify in plain text:			
• in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	<b>Y01</b>	✓	✓ <sup>1)</sup>
• in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	<b>Y02</b>	✓	
<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>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 pressure indication in non-pressure units<sup>2)</sup></b>	<b>Y22 + Y01 or Y02</b>	✓	
Specify in plain text: Y22: ..... up to ..... l/min, m <sup>3</sup> /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" 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: .....			
<b>Damping adjustment in seconds (0 ... 100 s)</b>	<b>Y30</b>	✓	✓

1) Device plug Han IP65

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

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

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

5) Cannot be ordered with remote seal.

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

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

Factory mounting of valve manifolds, see accessories.

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

✓ = available

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

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

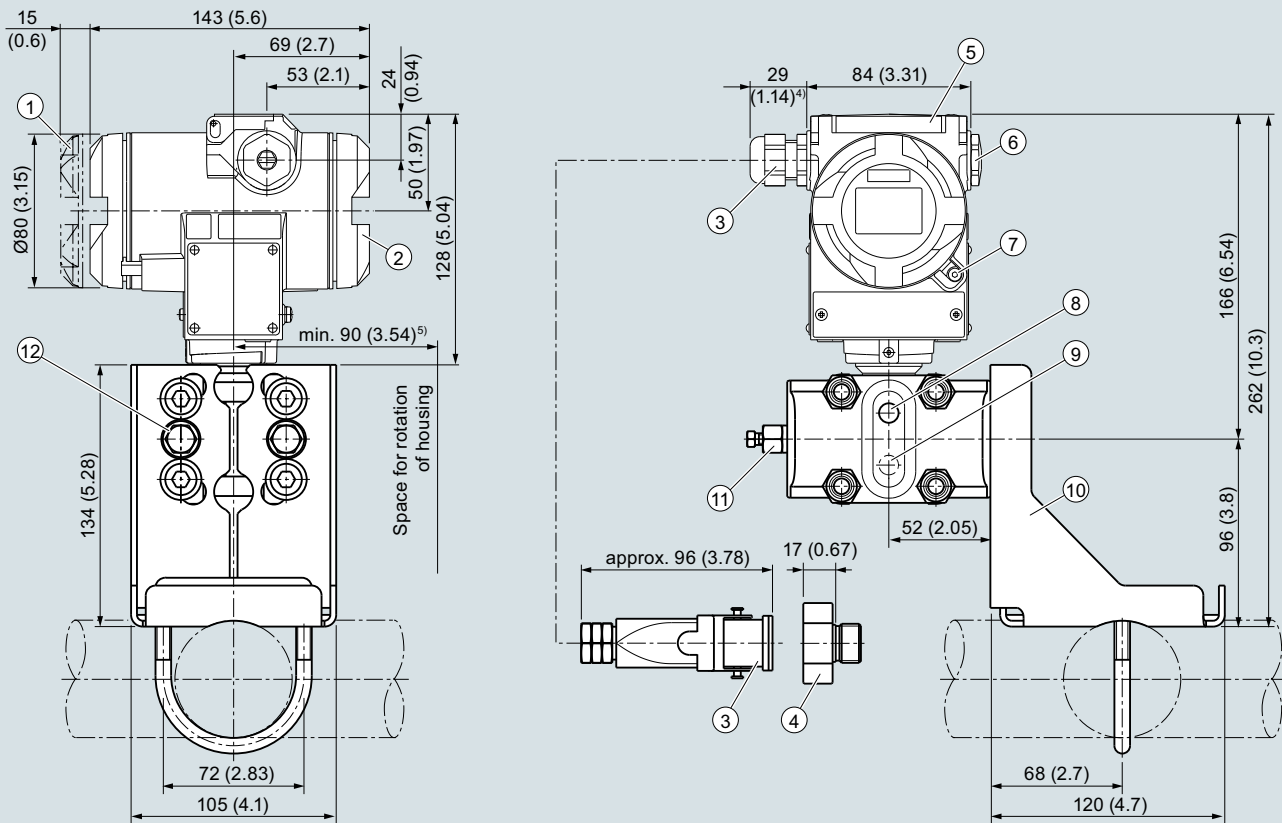
# Pressure Measurement

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

for differential pressure and flow

1

## Dimensional drawings

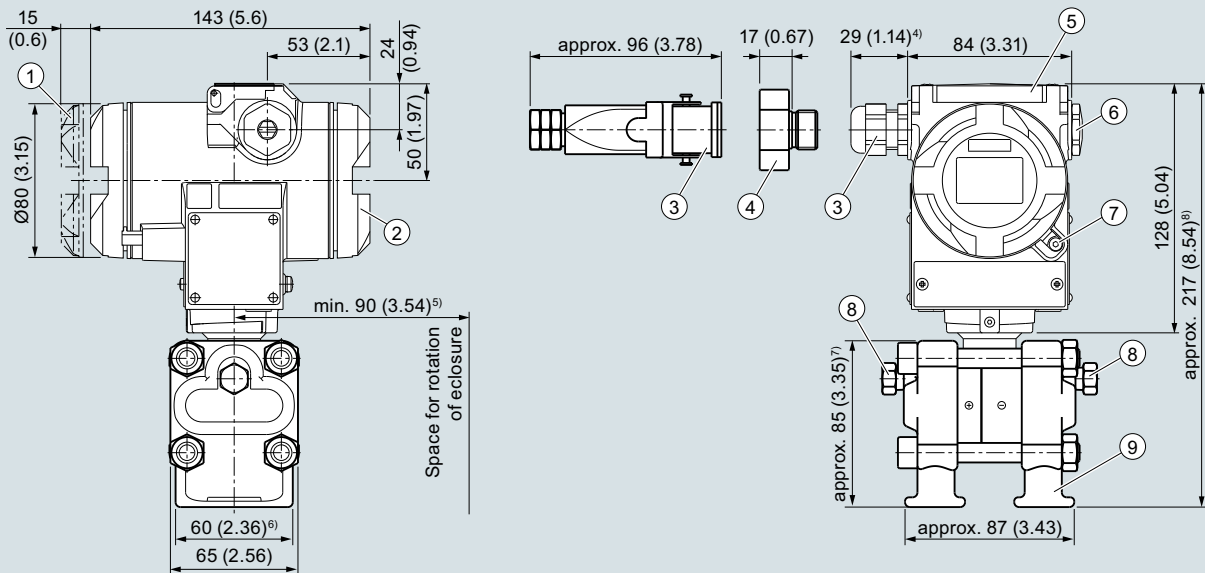


- ① Electronics side, local display  
(longer overall length for cover with inspection window)<sup>1)</sup>
- ② Connection side<sup>1)</sup>
- ③ Electrical connection:
  - Pg 13.5 screw gland (adapter)<sup>2) 3)</sup>
  - M20 x 1,5 screw gland
  - ½-14 NPT screw gland
  - Han 7D/Han 8D<sup>2) 3)</sup>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

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

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

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



- ① Electronics side, local display (longer overall length for cover with inspection window)<sup>1)</sup>
- ② Connection side<sup>1)</sup>
- ③ Electrical connection:
  - Pg 13.5 screw gland (adapter)<sup>2)3)</sup>
  - M20 x 1,5 screw gland
  - ½-14 NPT screw gland
  - Han 7D/Han 8D<sup>2)3)</sup> device plug
- ④ Harting adapter

- ⑤ Cover over buttons
- ⑥ Blanking plug
- ⑦ Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
- ⑧ Sealing plug with valve (optional)
- ⑨ Process connection: ¼-18 NPT (IEC 61518)

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

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



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