

# Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

1

## Technical specifications

### SITRANS P410 for gauge pressure

#### Input

Measured variable

Gauge pressure

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)	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
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

Lower measuring limit

- Measuring cell with silicone oil filling

30 mbar a/3 kPa a/0.44 psi a

Upper measuring limit

100 % of max. span

#### Output

Output signal

HART	PROFIBUS PA/FOUNDATION Fieldbus
4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
3.55 mA, factory preset to 3.84 mA	-
23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-
$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$ $U_H$ : Power supply in V	-
$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)	-
-	IEC 61158-2
Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.	
Set to 2 s (0 ... 100 s)	

- Lower limit (infinitely adjustable)

- Upper limit (infinitely adjustable)

Load

- Without HART

- With HART

Physical bus

Protection against polarity reversal

Electrical damping (step width 0.1 s)

**SITRANS P410 for gauge pressure****Measuring accuracy**

Reference conditions

Acc. to IEC 60770-1

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

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

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

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

 $r \leq 5 : \leq 0.04 \%$   
 $5 < r \leq 100 : \leq (0.004 \cdot r + 0.045) \%$ 
Influence of ambient temperature  
(in percent per 28 °C (50 °F))

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

 $\leq (0.05 \cdot r + 0.1) \%$   
 $\leq (0.025 \cdot r + 0.125) \%$ 
Long-term stability (temperature change  $\pm 30$  °C ( $\pm 54$  °F))

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

 $\leq (0.25 \cdot r) \%$  in 5 years  
 $\leq (0.125 \cdot r) \%$  in 5 years

Effect of mounting position

 $\leq 0.05 \text{ mbar}/0.005 \text{ kPa}/0.000725 \text{ psi}$  per 10° inclination  
 (zero point correction is possible with position error compensation)
Effect of auxiliary power supply  
(in percent per change in voltage)

0.005 % per 1 V

Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus

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

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#### 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
- Measuring cell with inert filling liquid
- In conjunction with dust explosion protection

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- Ambient temperature

- Transmitter

-40 ... +85 °C (-40 ... +185 °F)

- Display readable

-30 ... +85 °C (-22 ... +185 °F)

- Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

- Climatic class

- Condensation

Relative humidity 0 ... 100 %

Condensation permissible, suitable for use in the tropics

- Electromagnetic Compatibility

- Emitted interference and interference immunity

Acc. to IEC 61326 and NAMUR NE 21

#### Design

Weight (without options)

Die-cast aluminum: ≈ 2.0 kg (≈ 4.4 lb)

Stainless steel precision casting: ≈ 4.6 kg (≈ 10.1 lb)

Enclosure material

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

Wetted parts materials

- Connection shank
- Oval flange
- Seal diaphragm

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

Stainless steel, mat. no. 1.4404/316L

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

Measuring cell filling

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

Process connection

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

Material of mounting bracket

- Steel
- Stainless steel 304
- Stainless steel 316L

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

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

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

#### Power supply $U_H$

Terminal voltage on transmitter

#### 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  $\leq$  basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

**SITRANS P410 for gauge pressure****Certificates and approvals**

Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection	PTB 13 ATEX 2007 X	
• Intrinsic safety "i"	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Marking		
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ ; $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$ , $I_o = 174 \text{ mA}$ , $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20 (pending)	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 100 \text{ mA}$ , $P_i = 750 \text{ mW}$ , $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$ , $I_o = 380 \text{ mA}$ , $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$ , $I_o = 250 \text{ mA}$ , $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22 (pending)	PTB 01 ATEX 2055	
- Marking	Ex II 2 D Ex tb IIIC T120°C Db	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ ; $P_{\max} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$ ; $P_{\max} = 1 \text{ W}$
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	$U_m = 45 \text{ V}$	$U_m = 32 \text{ V}$
- Connections (Ex ic)	To circuits with values: $U_i = 45 \text{ V}$	FISCO supply unit ic: $U_o = 17.5 \text{ V}$ , $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$ , $I_o = 132 \text{ mA}$ , $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$ , $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$ , $C_i = 1.1 \text{ nF}$
• Explosion protection acc. to FM (pending)	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA (pending)	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

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HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
<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		

Selection and Ordering data	Article No.	Order code
<b>Pressure transmitter for gauge pressure, SITRANS P410 with HART</b>	7MF4033-	-Z C41
<a href="#">Click on the Article No. for the online configuration in the PIA Life Cycle Portal.</a>		
<b>Measuring cell filling</b> Silicone oil		
<b>Measuring cell cleaning</b> normal		
<b>Measuring span (min. ... max.)</b>		
0.01 ... 1 bar (0.15 ... 14.5 psi)	B	
0.04 ... 4 bar (0.58 ... 58 psi)	C	
0.16 ... 16 bar (2.32 ... 232 psi)	D	
0.63 ... 63 bar (9.14 ... 914 psi)	E	
1.6 ... 160 bar (23.2 ... 2320 psi)	F	
<b>Wetted parts materials</b>		
Seal diaphragm		
Stainless steel	A	
Hastelloy	B	
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)</sup>	Y 1	
Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" <sup>1) 2) 3) 4)</sup>	Y 0	
<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)		
- 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>		
• Housing made of die-cast aluminium	0	
• Housing stainless steel precision casting <sup>5)</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		
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		A
- "Explosion-proof (Ex d)" <sup>6)</sup>		B
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) <sup>7)</sup>		D
- "Ex nA/ic (Zone 2)" <sup>8)</sup>		P
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" <sup>7)9)</sup>		E
• FM + CSA intrinsic safe (is) (pending) <sup>10)</sup>		R
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D <sup>7)9)10)</sup>		F
• With FM + CSA, Type of protection:		S
- "Intrinsic Safe and Explosion Proof (is + xp)" <sup>6)10)</sup>		NC
<b>Electrical connection / cable entry</b>		
• Screwed gland M20 x1 .5		B
• Screwed gland 1/2-14 NPT		C
• Device plug Han 7D (plastic housing) incl. mating connector <sup>11)</sup>		D
• Device plugs M12 (stainless steel) <sup>11)12)</sup>		F

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### Selection and Ordering data

Article No.

Order code

#### Pressure transmitter for gauge pressure, SITRANS P410 with HART

7MF4033-

-Z C41

#### Display

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

Power supply units 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 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) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF4033-...Y.-... and 7MF4900-1...-B
- 4) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
- 5) Not in conjunction with Electrical connection "device plug Han 7D".
- 6) Without cable gland, with blanking plug
- 7) With enclosed cable gland Ex ia and blanking plug
- 8) Configurations with device plugs Han and M12 are only available in Ex ic.
- 9) Only in connection with IP66.
- 10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 11) Only in connection with Ex approval A, B or E.
- 12) M12 delivered without cable socket

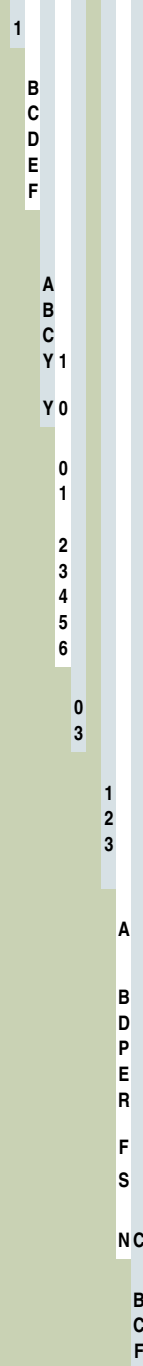
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Selection and Ordering data	Article No.	Order code
<b>Pressure transmitter for gauge pressure</b>		
<b>SITRANS P410 with PROFIBUS PA (PA)</b>	➤ 7MF4034-	-Z C41
<b>SITRANS P410 with FOUNDATION Fieldbus (FF)</b>	➤ 7MF4035-	-Z C41
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
<b>Measuring cell filling</b> <b>Measuring cell cleaning</b>		
Silicone oil		normal
<b>Nominal measuring range</b>		
1 bar      (14.5 psi)		
4 bar      (58 psi)		
16 bar     (232 psi)		
63 bar     (914 psi)		
160 bar    (2320 psi)		
<b>Wetted parts materials</b>		
Seal diaphragm		Process connection
Stainless steel		Stainless steel
Hastelloy		Stainless steel
Hastelloy		Hastelloy
Version for diaphragm seals in conjunction with process connector "female thread 1/2-14 NPT" <b>(recommended version)</b> <sup>1) 2) 3) 4)</sup>		
Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" <sup>1) 2) 3) 4)</sup>		
<b>Process connection</b>		
<ul style="list-style-type: none"> <li>• Connection shank G1/2B to EN 837-1</li> <li>• Female thread 1/2-14 NPT</li> <li>• Stainless steel oval flange with process connection (Oval flange has no female thread) <sup>5)</sup> <ul style="list-style-type: none"> <li>- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518</li> <li>- Mounting thread M10 to DIN 19213</li> <li>- Mounting thread M12 to DIN 19213</li> </ul> </li> <li>• Male thread M20 x 1.5</li> <li>• Male thread 1/2 -14 NPT</li> </ul>		
<b>Non-wetted parts materials</b>		
<ul style="list-style-type: none"> <li>• Housing made of die-cast aluminium</li> <li>• Housing stainless steel precision casting</li> </ul>		
<b>Version</b>		
<ul style="list-style-type: none"> <li>• Standard version, German label inscription, setting of pressure unit: bar</li> <li>• International version, English label inscription, setting of pressure unit: psi</li> <li>• Chinese version, English label inscription, setting of pressure unit: kPa</li> </ul> All versions include DVD with compact operating instructions in various EU languages.		
<b>Explosion protection</b>		
<ul style="list-style-type: none"> <li>• None</li> <li>• With ATEX, Type of protection:                             <ul style="list-style-type: none"> <li>- "Intrinsic safety (Ex ia)"</li> <li>- "Explosion-proof (Ex d)"<sup>6)</sup></li> <li>- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)<sup>7)</sup></li> <li>- "Ex nA/ic (Zone 2)"<sup>8)</sup></li> <li>- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"<sup>7) 9)</sup></li> </ul> </li> <li>• FM + CSA intrinsic safe (is)<sup>10)</sup></li> <li>• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D<sup>7)9)10)</sup></li> <li>• With FM + CSA, Type of protection:                             <ul style="list-style-type: none"> <li>- "Intrinsic Safe and Explosion Proof (is + xp)"<sup>6)10)</sup></li> </ul> </li> </ul>		
<b>Electrical connection/cable entry</b>		
<ul style="list-style-type: none"> <li>• Screwed gland M20 x 1.5</li> <li>• Screwed gland 1/2-14 NPT</li> <li>• Device plugs M12 (stainless steel)<sup>11) 12)</sup></li> </ul>		





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<b>Pressure transmitter for gauge pressure</b>		
<b>SITRANS P410 with PROFIBUS PA (PA)</b>	<b>7MF4034-</b>  - 	<b>-Z C41</b>
<b>SITRANS P410 with FOUNDATION Fieldbus (FF)</b>	<b>7MF4035-</b>  - 	<b>-Z C41</b>
<b>Display</b>		
• Without display		0
• Without visible display (display concealed, setting: bar)		1
• With visible display (setting: bar)		6
• with customer-specific display (setting as specified, Order code "Y21" required)		7

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

- 1) 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) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-..Y.-.... and 7MF4900-1...-B
- 4) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
- 5) M10 fastening thread: Max. span 160 bar (2320 psi)  
7/16-20 UNF and M12 fastening thread: Max. span 400 bar (5802 psi)
- 6) Without cable gland, with blanking plug.
- 7) With enclosed cable gland Ex ia and blanking plug.
- 8) Configurations with device plugs Han and M12 are only available in Ex ic.
- 9) Only in connection with IP66.
- 10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 11) M12 delivered without cable socket.
- 12) Only in connection with Ex approval A, B, E or F.

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>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	✓	✓	✓
• Steel	A01	✓	✓	✓	<b>CRN approval Canada</b> (Canadian Registration Number)	E22 <sup>5)</sup>	✓	✓	✓
• Stainless steel 304	A02	✓	✓	✓	<b>Dual seal</b>	E24	✓	✓	✓
• Stainless steel 316L	A03	✓	✓	✓	<b>Explosion-proof "Intrinsic safety" to NEPSI (China)</b> (only for transmitter 7MF4...-...-B..)	E55 <sup>6)</sup>	✓	✓	✓
<b>Device plugs<sup>1)</sup></b>					<b>Explosion protection "Explosion-proof" to NEPSI (China)</b> (only for transmitter 7MF4...-...-D..)	E56 <sup>6)</sup>	✓	✓	✓
• Han 7D (metal)	A30	✓			<b>Ex protection "Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-...-E..)	E57 <sup>6)</sup>	✓	✓	✓
• Han 8D (instead of Han 7D)	A31	✓			<b>Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China)</b> (only for transmitter 7MF4...-...-R..)	E58 <sup>6)</sup>	✓	✓	✓
• Angled	A32	✓			<b>"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)</b> (pending)	E70 <sup>6)</sup>	✓	✓	✓
• Han 8D (metal)	A33	✓			(only for transmitter 7MF4...-...-[B, D]..-Z + E11)				
<b>Cable sockets for device plugs M12 (metal (CuZn))</b>	A50	✓	✓	✓	<b>Ex-protection Ex ia according to EAC Ex (Russia)</b>	E80	✓	✓	✓
<b>Rating plate inscription</b> (instead of German)					<b>Ex-protection Ex d according to EAC Ex (Russia)</b>	E81	✓	✓	✓
• English	B11	✓	✓	✓	<b>Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)</b>	E82	✓	✓	✓
• French	B12	✓	✓	✓	<b>Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)</b>	E83	✓	✓	✓
• Spanish	B13	✓	✓	✓	<b>Two coats of lacquer on casing and cover (PU on epoxy)</b>	G10	✓	✓	✓
• Italian	B14	✓	✓	✓	<b>Transient protector 6 kV (lightning protection)</b>	J01	✓	✓	✓
<b>English rating plate</b> Pressure units in inH <sub>2</sub> O and/or psi	B21	✓	✓	✓	<b>Oval flange NAM (ASTAVA)</b>	J06	✓	✓	✓
<b>Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2<sup>2)</sup></b>	C11	✓	✓	✓	<b>Marine approvals</b>				
<b>Inspection certificate<sup>3)</sup></b> Acc. to EN 10204-3.1	C12	✓	✓	✓	• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓	✓
<b>Factory certificate</b> Acc. to EN 10204-2.2	C14	✓	✓	✓	• Lloyds Register (LR)	S11	✓	✓	✓
<b>Acceptance certificate (EN 10204-3.1)</b> PMI test of parts in contact with medium	C15	✓	✓	✓	• French marine classification society Bureau Veritas (BV)	S12	✓	✓	✓
<b>Functional safety (SIL2) (pending)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓			• American Bureau of Shipping (ABS)	S14	✓	✓	✓
<b>Functional safety (SIL2/3)</b> Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓			• Russian Maritime Register (RMR)	S16	✓	✓	✓
<b>Increased measuring accuracy</b> (mandatory specification for SITRANS P410)	C41	✓	✓	✓	• Korean Register of Shipping (KR)	S17	✓	✓	✓
<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>Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)</b>	D07	✓	✓	✓					
<b>Degree of protection IP66/IP68</b> (only for M20x1.5 and ½"-14 NPT)	D12	✓	✓	✓					
<b>Supplied with oval flange</b> (1 item), PTFE packing and screws in thread of oval flange	D37	✓	✓	✓					
<b>Capri cable gland 4F CrNi and clamping device (848699 + 810634) included</b>	D59	✓	✓	✓					
<b>TAG plate empty (no inscription)</b>	D61	✓	✓	✓					

Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/254).

- 1) Device plug Han IP65
- 2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 3) If the acceptance test certificate 3.1. is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 4) 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.

# Pressure Measurement

Pressure transmitters  
for applications with advanced requirements (Advanced)  
SITRANS P410

## for gauge pressure

1

Selection and Ordering data	Order code			
<i>Additional data</i>		HART	PA	FF
Please add <b>"-Z"</b> to Article No. and specify Order code(s) and plain text.				
<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>Stainless steel tag plate and entry in device variable (measuring point description)</b> Max. 16 characters, specify in plain text: Y15: .....	Y15	✓	✓	✓
<b>Measuring point text (entry in device variable)</b> Max. 27 characters, specify in plain text: Y16: .....	Y16	✓	✓	✓
<b>Entry of HART address (TAG)</b> Max. 8 characters, specify in plain text: Y17: .....	Y17	✓		
<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>Setting of pressure indication 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" is essential, unit with max. 5 characters)	Y22 + Y01	✓		

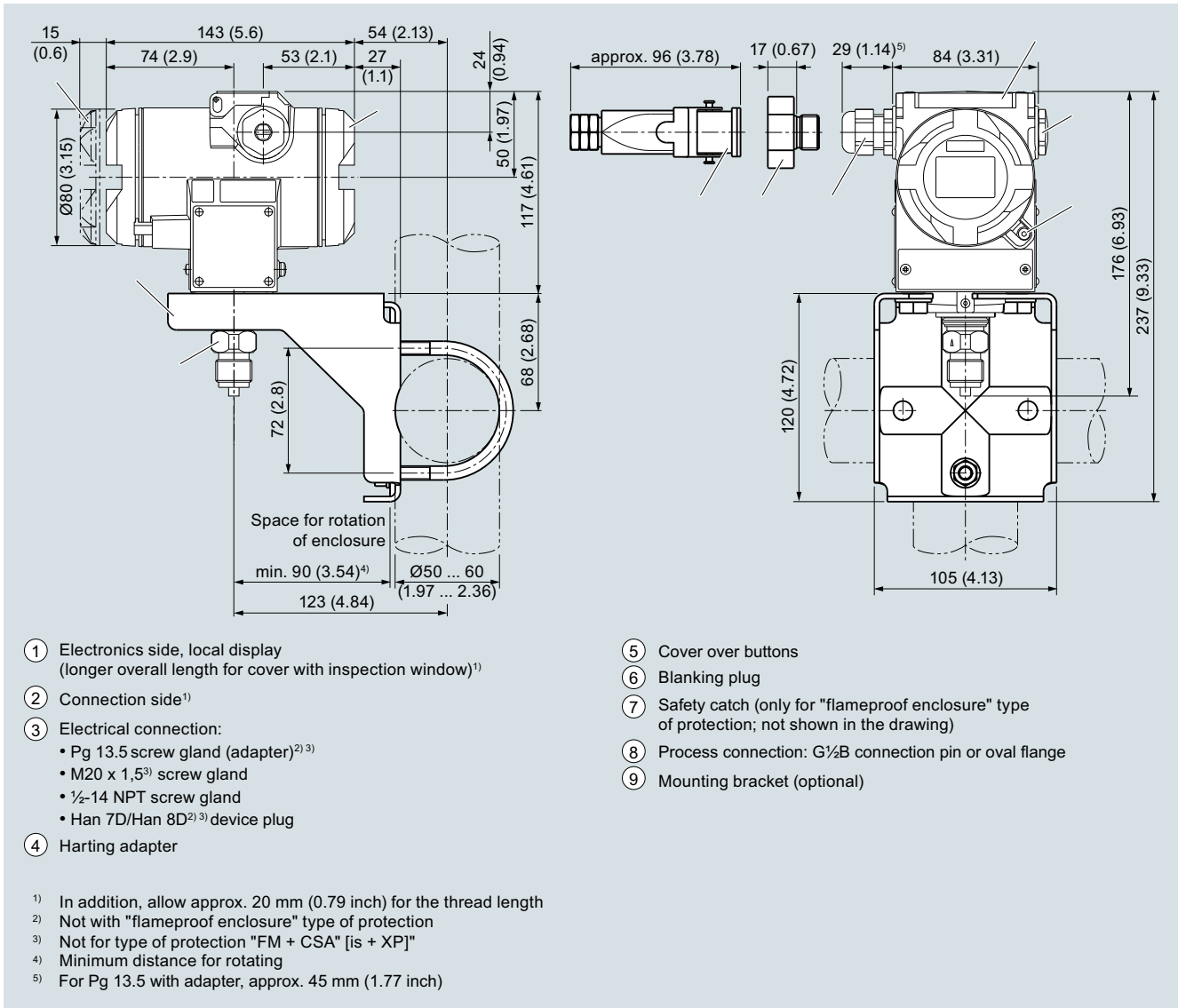
✓ = available

### Ordering example

Item line: 7MF4033-1EA00-1AA7-Z C41  
B line: A01 + Y01 + Y21  
C line: Y01: 10 ... 20 bar (145 ... 290 psi)  
C line: Y21: bar (psi)

- 1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.  
2) Preset values can only be changed over SIMATIC PDM.

## Dimensional drawings



SITRANS P410 pressure transmitters for gauge pressure, dimensions in mm (inch)