Technical description

Overview

SITRANS P410 pressure transmitters are digital pressure transmitters with a high level of operating convenience. Technically, they are based on the SITRANS P DS III but offer an increased measuring accuracy of 0.04%. This means the SITRANS P 410 is perfectly suited for measuring tasks with increased accuracy requirements. The parameterization is performed using input buttons or via HART or via PROFIBUS PA or FOUNDATION Fieldbus interface.

The comprehensive functionality makes for precise adjustment of the pressure transmitter to the requirements of the plant. Operation is very simple, despite the variety of setting options.

Pressure transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed in hazardous areas (zone 1) or in zone 0. The transmitters are provided with an EC type examination certificate and comply with the respective harmonized European standards (ATEX).

The transmitters can be equipped with various designs of remote seals for special applications such as the measurement of highly viscous substances.

SITRANS P410 pressure transmitters are available in various versions for measuring:

- Gauge pressure
- Differential pressure
- Volume flow
- Mass flow

Benefits

- High quality and service life
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnostics and simulation functions
- Minimal conformity error
- Good long-term stability
- Wetted parts made of high-grade materials (e.g., stainless steel, Hastelloy)
- Infinitely adjustable spans from 0.01 bar to 160 bar (0.15 psi to 2321 psi) for P410 with HART interface
- Nominal measuring ranges from 1 bar to 160 bar (14.5 psi to 2321 psi) for P410 with PROFIBUS PA and FOUNDATION Fieldbus interface
- High measuring accuracy
- Parameterization over input buttons and HART, PROFIBUS PA or FOUNDATION Fieldbus interface.

Application

SITRANS P410 pressure transmitters can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes the P410 suitable for locations with high electromagnetic emissions.

Pressure transmitters with type of protection "Flameproof enclosure" may be installed in hazardous areas (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 input buttons or programmed externally over HART or over PROFIBUS PA or FOUNDATION Fieldbus interface.

Pressure transmitter for gauge pressure

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

Span (infinitely adjustable)
for P410 with HART: 0.01 bar to 160 bar (0.15 psi to 2321 psi)

Nominal measuring range
for P410 with PROFIBUS PA and FOUNDATION Fieldbus:
1 bar to 160 bar (14.5 psi to 2321 psi)

Pressure transmitters for differential pressure and flow

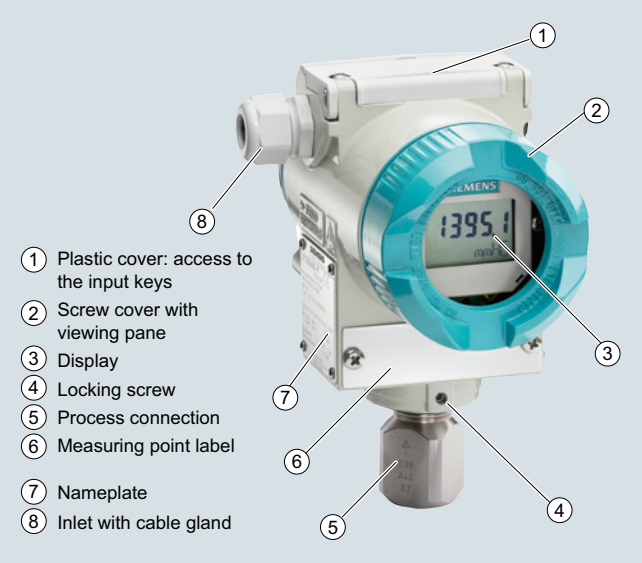
Measured variables:

- Differential pressure
- Small positive or negative pressure
- Flow $q \sim \sqrt{\Delta p}$ (together with a primary differential pressure device (see Chapter "Flow Meters"))

Span (infinitely adjustable)
for P410 with HART: 1 mbar ... 30 bar (0.0145 ... 435 psi)

Nominal measuring range
for P410 with PROFIBUS PA and FOUNDATION Fieldbus:
20 mbar ... 30 bar (0.29 ... 435 psi)

Design



Front view

The transmitter consists of various components depending on the order. The possible versions are listed in the ordering information. The components described below are the same for all transmitters.

The rating plate (7, Figure "Front view") with the Article No. is located on the side of the 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).

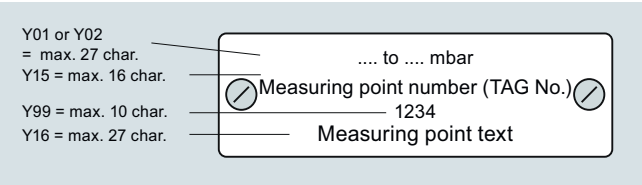
The approval label is located on the opposite side.

The housing is made of die-cast aluminium or stainless steel precision casting. A round cover (6) is screwed on at the front and rear of the housing. The front cover can be fitted with a viewing pane so that the measured values can be read directly on the display. The inlet (8) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the 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.

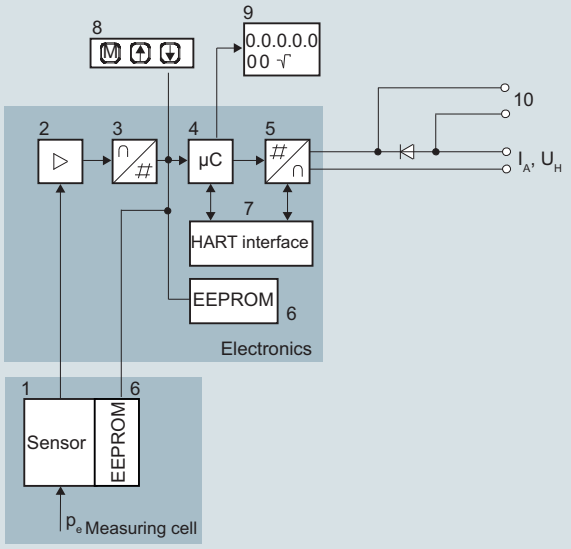
At the top of the housing is a plastic cover (1), which hides the input keys.

Example for an attached measuring point label



Function

Operation of electronics with HART communication



1 Measuring cell sensor
2 Instrument amplifier
3 Analog-to-digital converter
4 Microcontroller
5 Digital-to-analog converter
6 One non-volatile memory each in the measuring cell and electronics
7 HART interface
8 Three input keys (local operation)
9 Digital display
10 Diode circuit and connection for external ammeter
I_A Output current
U_H Power supply
P_e Input variable

Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in a microcontroller, its linearity and temperature response corrected, and converted in a digital-to-analog converter (5) into an output current of 4 to 20 mA.

The diode circuit (10) protects against incorrect polarity.

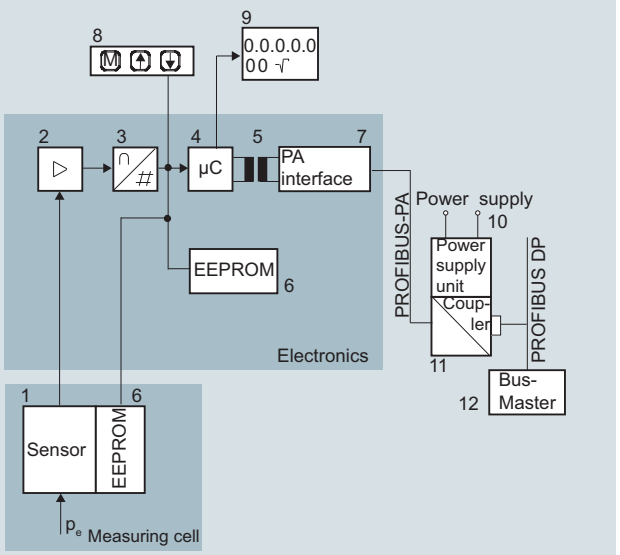
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

Using the 3 input keys (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

The HART modem (7) permits parameterization using a protocol according to the HART specification.

The pressure transmitters with spans ≤ 63 bar measure the input pressure compared to atmosphere, transmitters with spans ≥ 160 bar compared to vacuum.

Operation of electronics with PROFIBUS PA communication



1 Measuring cell sensor
2 Instrument amplifier
3 Analog-to-digital converter
4 Microcontroller
5 Electrical isolation
6 One non-volatile memory each in the measuring cell and electronics
7 PROFIBUS-PA interface
8 Three input keys (local operation)
9 Digital display
10 Power supply
11 DP/PA coupler or link
12 Bus master
p_e Input variable

Function diagram of electronics

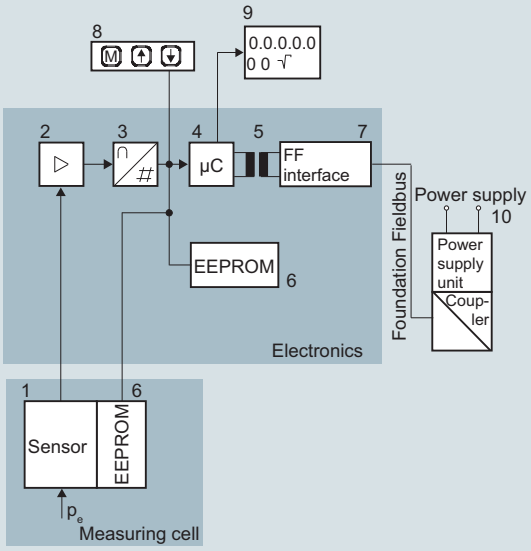
The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the PROFIBUS PA through an electrically isolated PA interface (7).

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

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

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

Operation of electronics with FOUNDATION Fieldbus communication



1	Measuring cell sensor	8	Three input keys (local operation)
2	Instrument amplifier	9	Digital display
3	Analog-to-digital converter	10	Power supply
4	Microcontroller		
5	Electrical isolation	p_e	Input variable
6	One non-volatile memory each in the measuring cell and electronics		
7	FF interface		

Function diagram of electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, and provided on the FOUNDATION Fieldbus through an electrically isolated FOUNDATION Fieldbus interface (7).

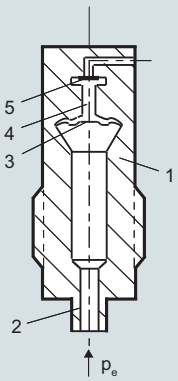
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

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

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

Mode of operation of the measuring cells

Measuring cell for gauge pressure

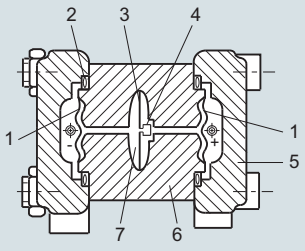


1	Measuring cell
2	Process connection
3	Seal diaphragm
4	Filling liquid
5	Silicon pressure sensor
p_e	Pressure as input variable

Measuring cell for gauge pressure, function diagram

The pressure p_e is applied through the process connection (2, Figure "Measuring cell for gauge pressure, function diagram) to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the differential pressure.

Measuring cell for differential pressure and flow



1	Seal diaphragm
2	O-ring
3	Overload diaphragm
4	Silicon pressure sensor
5	Process flange
6	Body of measuring cell
7	Filling liquid

Measuring cell for differential pressure and flow, function diagram

The differential pressure is transmitted through the seal diaphragms (1, Figure "Measuring cell for differential pressure and flow, function diagram") and the filling liquid (7) to the silicon pressure sensor (4).

The measuring diaphragm is flexed by the applied differential pressure. This changes the resistance of the four piezo-resistors fitted in the diaphragm in a bridge circuit. This change in resistance results in a bridge output voltage proportional to the differential pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (3) is flexed until the seal diaphragm rests on the body of the measuring cell (6), thus protecting the silicon pressure sensor from overloads.

Parameterization SITRANS P410

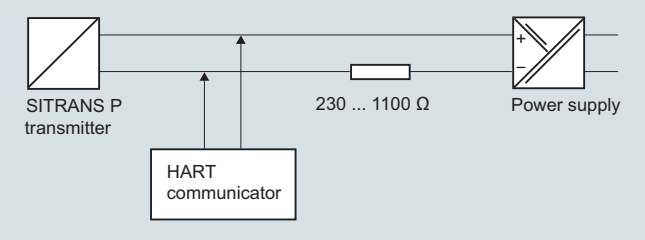
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

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

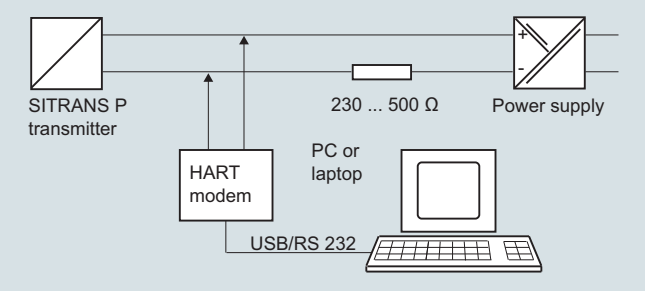
Parameterization using HART

Parameterization using HART is performed with a HART Communicator or a PC.



Communication between a HART Communicator and a pressure transmitter

When parameterizing with the HART Communicator, the connection is made directly to the 2-wire cable.



HART communication between a PC communicator and a pressure transmitter

When parameterizing with a PC, the connection is made through a HART modem.

The signals needed for communication in conformity with the HART 5.x or 6.x protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

Adjustable parameters, SITRANS P410 with HART

Parameters	Input keys (DS III HART)	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[1)]
Type of dimension and actual dimension	x	x
Characteristic (linear / square-rooted)	x[2)]	x[2)]
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

1) Cancel apart from write protection
2) Only differential pressure

Diagnostic functions for SITRANS P410 with HART

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

Available physical units of display for SITRANS P410 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^2, kg/cm^2, inH$_2$O, inH$_2$O (4 °C), mmH$_2$O, ftH$_2$O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m^3, dm^3, hl, yd^3, ft^3, in^3, US gallon, Imp. gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
volume flow	m^3/d, m^3/h, m^3/s, l/min, l/s, ft^3/d, ft^3/min, ft^3/s, US gallon/min, US gallon/s
Mass flow	t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/d, g/h, g/min, g/s, lb/d, lb/h, lb/min, lb/s, LTon/d, LTon/h, STon/d, STon/h, STon/min
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

Parameterization through PROFIBUS PA interface

Fully digital communication through PROFIBUS PA, profile 3.0, is particularly user-friendly. Through the PROFIBUS the DS III with PROFIBUS PA is connected to a process control system, e. g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

For parameterization through PROFIBUS you need suitable software, e.g. SIMATIC PDM (Process Device Manager).

Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the DS III with FOUNDATION Fieldbus is connected to a process control system. Communication is possible even in a potentially explosive environment.

For parameterization through the FOUNDATION Fieldbus you need suitable software, e.g. National Instruments Configurator.

Adjustable parameters for SITRANS P410 with PROFIBUS PA and FOUNDATION Fieldbus

Parameters	Input keys	PROFIBUS PA and FOUNDATION Fieldbus interface
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Buttons and/or function disabling	x	x
Source of measured-value display	x	x
Physical dimension of display	x	x
Position of decimal point	x	x
Bus address	x	x
Adjustment of characteristic	x	x
Input of characteristic		x
Freely-programmable LCD		x
Diagnostics functions		x

Diagnostic functions for SITRANS P410 with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Slave pointer
- Maintenance timer
- Simulation functions
- Display of zero correction
- Limit transmitter
- Saturation alarm

Physical dimensions available for the display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	MPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm^2, kg/cm^2, mmH_2O, mmH_2O (4 °C), inH_2O, in$H_2$0 (4 °C), ftH_2O (20 °C), mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Volume	m^3, dm^3, hl, yd^3, ft^3, in^3, US gallon, Imp. gallon, bushel, barrel, barrel liquid
volume flow	m^3/s, m^3/min, m^3/h, m^3/d, l/s, l/min, l/h, l/d, Ml/d, ft^3/s, ft^3/min, ft^3/h, ft^3/d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d
Mass flow	g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, /t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d
Total mass flow	t, kg, g, lb, oz, LTon, STon
Temperature	K, °C, °F, °R
Miscellaneous	%

Technical specifications

SITRANS 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**		
	Span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 psi	10 bar 1 MPa 145 psi
	0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
	0.63 ... 63 bar 63 ... 6300 kPa 9.1 ... 914 psi	63 bar 6300 kPa 914 psi	67 bar 6.7MPa 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	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-
Load		
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V	-
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)	-
Physical bus	-	IEC 61158-2
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.	
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)	

SITRANS P410 for gauge pressure	
Measuring accuracy	Acc. to IEC 60770-1
Reference conditions	• 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 = 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	$r \leq 5$: ≤ 0.04 % $5 < r \leq 100$: ≤ (0.004 · r + 0.045) %
Influence of ambient temperature (in percent per 28 °C (50 °F))	
• 1 bar/100 kPa/14.5 psi	≤ (0.05 · r + 0.1) %
• 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi	≤ (0.025 · r + 0.125) %
Long-term stability (temperature change ± 30 °C (± 54 °F))	
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi	≤ (0.25 · r) % in 5 years
• 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi	≤ (0.125 · r) % in 5 years
Effect of mounting position	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° inclination (zero point correction is possible with position error compensation)
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range

SITRANS P410 for gauge pressure		
Rated conditions		
Degree of protection		
• according to EN 60529	IP66 (optional IP66/IP68)	
• according to NEMA 250	Type 4X	
Temperature of medium		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)	
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
• Ambient temperature		
- Transmitter	-40 ... +85 °C (-40 ... +185 °F)	
- Display readable	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
• Electromagnetic Compatibility		
- Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21	
Design		
Weight (without options)	Die-cast aluminum: ≈ 2.0 kg (≈ 4.4 lb) Stainless steel precision casting: ≈ 4.6 kg (≈ 10.1 lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
• Connection shank	Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4602	
• Oval flange	Stainless steel, mat. no. 1.4404/316L	
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819	
Measuring cell filling	Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))	
Process connection	Connection shank G½B to DIN EN 837-1, female thread ½ -14 NPT or oval flange (PN 160 (MAWP 2320 psi)) to DIN 19213 with mounting thread M10 or $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518	
Material of mounting bracket		
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)	
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)	
Power supply U_H	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate 24 V power supply necessary	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS 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		
• Intrinsic safety "i"	PTB 13 ATEX 2007 X	
- Marking	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 174 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 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 ... 45 V DC	To circuits with values: U_H = 9 ... 32 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 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 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 ... 45 V DC; P_{max} = 1.2 W	To circuits with values: U_H = 9 ... 32 V DC; P_{max} = 1 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 V	U_m = 32 V
- Connections (Ex ic)	To circuits with values: U_i = 45 V	FISCO supply unit ic: U_o = 17.5 V, I_o = 570 mA Linear barrier: U_o = 32 V, I_o = 132 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 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	

for gauge pressure

HART communication	
HART	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- 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

FOUNDATION Fieldbus communication	
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function

Selection and Ordering data	Article No.	Order code
Pressure transmitter for gauge pressure, SITRANS P410 with HART ↗	**7MF4033-** ▪▪▪▪▪ - ▪▪▪▪	**-Z C41**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling / **Measuring cell cleaning**		
Silicone oil / normal	1	
Measuring span (min. ... max.)		
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	
Wetted parts materials		
Seal diaphragm / Process connection		
Stainless steel / Stainless steel	A	
Hastelloy / Stainless steel	B	
Hastelloy / Hastelloy	C	
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" **(recommended version)** [1) 2) 3) 4)]	Y 1	
Version for diaphragm seals in conjunction with process connector "G½B connection shank" [1) 2) 3) 4)]	Y 0	
Process connection		
• Connection shank G½B to EN 837-1	0	
• Female thread ½-14 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 ½ -14 NPT	6	
Non-wetted parts materials		
• Housing made of die-cast aluminium	0	
• Housing stainless steel precision casting[5)]	3	
Version		
• Standard version, German plate inscription, setting for pressure unit: bar	1	
• International version, English plate inscription, setting for pressure unit: bar	2	
• Chinese version, English plate inscription, setting for pressure unit: Pascal	3	
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None	A	
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"	B	
- "Explosion-proof (Ex d)"[6)]	D	
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[7)]	P	
- "Ex nA/ic (Zone 2)"[8)]	E	
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[7)9)]	R	
• FM + CSA intrinsic safe (is) (pending)[10)]	F	
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[7)9)10)]	S	
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)"[6)10)]	N C	
Electrical connection / cable entry		
• Screwed gland M20 x1 .5	B	
• Screwed gland ½-14 NPT	C	
• Device plug Han 7D (plastic housing) incl. mating connector[11)]	D	
• Device plugs M12 (stainless steel)[11)12)]	F	

for gauge pressure

Selection and Ordering data	Article No.		Order code
Pressure transmitter for gauge pressure, SITRANS P410 with HART	**7MF4033-** ■■■■■ - ■■■■		**-Z C41**
Display			
• Without display		**0**	
• Without visible display (display concealed, setting: mA)		**1**	
• With visible display (setting: mA)		**6**	
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)		**7**	

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

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

1) 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) 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

Selection and Ordering data		Article No.	Order code
Pressure transmitter for gauge pressure			
SITRANS P410 with PROFIBUS PA (PA)	↗	**7MF4034-** ▢▢▢▢▢ - ▢▢▢▢	**-Z C41**
SITRANS P410 with FOUNDATION Fieldbus (FF)	↗	**7MF4035-** ▢▢▢▢▢ - ▢▢▢▢	**-Z C41**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring cell filling	**Measuring cell cleaning**		
Silicone oil	normal	1	
Nominal measuring range			
1 bar (14.5 psi)		B	
4 bar (58 psi)		C	
16 bar (232 psi)		D	
63 bar (914 psi)		E	
160 bar (2320 psi)		F	
Wetted parts materials			
Seal diaphragm	Process connection		
Stainless steel	Stainless steel	A	
Hastelloy	Stainless steel	B	
Hastelloy	Hastelloy	C	
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" **(recommended version)** [1) 2) 3) 4)]		Y 1	
Version for diaphragm seals in conjunction with process connector "G½B connection shank" [1) 2) 3) 4)]		Y 0	
Process connection			
• Connection shank G½B to EN 837-1		0	
• Female thread ½-14 NPT		1	
• Stainless steel oval flange with process connection (Oval flange has no female thread) [5)]			
- 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 ½ -14 NPT		6	
Non-wetted parts materials			
• Housing made of die-cast aluminium		0	
• Housing stainless steel precision casting		3	
Version			
• Standard version, German label inscription, setting of pressure unit: bar		1	
• International version, English label inscription, setting of pressure unit: psi		2	
• Chinese version, English label inscription, setting of pressure unit: kPa		3	
All versions include DVD with compact operating instructions in various EU languages.			
Explosion protection			
• None		A	
• With ATEX, Type of protection:			
- "Intrinsic safety (Ex ia)"		B	
- "Explosion-proof (Ex d)" [6)]		D	
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" [7)]		P	
- "Ex nA/ic (Zone 2)" [8)]		E	
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" [7) 9)]		R	
• FM + CSA intrinsic safe (is) [10)]		F	
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D [7)9)10)]		S	
• With FM + CSA, Type of protection:			
- "Intrinsic Safe and Explosion Proof (is + xp)" [6)10)]		N	C
Electrical connection/cable entry			
• Screwed gland M20 x 1.5			B
• Screwed gland ½-14 NPT			C
• Device plugs M12 (stainless steel) [11) 12)]			F

for gauge pressure

Selection and Ordering data	Article No.	Order code
Pressure transmitter for gauge pressure		
SITRANS P410 with PROFIBUS PA (PA)	**7MF4034-** ■■■■■ - ■■■■	**-Z C41**
SITRANS P410 with FOUNDATION Fieldbus (FF)	**7MF4035-** ■■■■■ - ■■■■	**-Z C41**
Display		
• Without display	**0**	
• Without visible display (display concealed, setting: bar)	**1**	
• With visible display (setting: bar)	**6**	
• with customer-specific display (setting as specified, Order code "Y21" required)	**7**	

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

1) 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	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:				
• Steel	**A01**	✓	✓	✓
• Stainless steel 304	**A02**	✓	✓	✓
• Stainless steel 316L	**A03**	✓	✓	✓
Device plugs[1]				
• Han 7D (metal)	**A30**	✓		
• Han 8D (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
• Han 8D (metal)	**A33**	✓		
Cable sockets for device plugs M12 (metal (CuZn))	**A50**	✓	✓	✓
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
English rating plate Pressure units in inH_20 and/or psi	**B21**	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2[2]	**C11**	✓	✓	✓
Inspection certificate[3] Acc. to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	**C14**	✓	✓	✓
Acceptance certificate (EN 10204-3.1) PMI test of parts in contact with medium	**C15**	✓	✓	✓
Functional safety (SIL2) (pending) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C20**	✓		
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C23**	✓		
Increased measuring accuracy (mandatory specification for SITRANS P410)	**C41**	✓	✓	✓
PED for Russia with initial calibration mark	**C99**	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	✓		
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)	**D07**	✓	✓	✓
Degree of protection IP66/IP68 (only for M20x1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Supplied with oval flange (1 item), PTFE packing and screws in thread of oval flange	**D37**	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	**D59**	✓	✓	✓
TAG plate empty (no inscription)	**D61**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Use in or on zone 1D/2D[4] (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-.B.. Ex ia)" and IP66)	**E01**	✓	✓	✓
CRN approval Canada (Canadian Registration Number)	**E22**[5]	✓	✓	✓
Dual seal	**E24**	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-.B..)	**E55**[6]	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-.D..)	**E56**[6]	✓	✓	✓
Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.E..)	**E57**[6]	✓	✓	✓
Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.R..)	**E58**[6]	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (pending) (only for transmitter 7MF4...-.....-.[B, D]..-Z + E11)	**E70**[6]	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)	**E80**	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)	**E81**	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	**E82**	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	**E83**	✓	✓	✓
Two coats of lacquer on casing and cover (PU on epoxy)	**G10**	✓	✓	✓
Transient protector 6 kV (lightning protection)	**J01**	✓	✓	✓
Oval flange NAM (ASTAVA)	**J06**	✓	✓	✓
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	**S10**	✓	✓	✓
• Lloyds Register (LR)	**S11**	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	**S12**	✓	✓	✓
• American Bureau of Shipping (ABS)	**S14**	✓	✓	✓
• Russian Maritime Register (RMR)	**S16**	✓	✓	✓
• Korean Register of Shipping (KR)	**S17**	✓	✓	✓

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.

for gauge pressure

Selection and Ordering data	Order code	HART	PA	FF
Additional data Please add "**-Z**" to Article No. and specify Order code(s) and plain text.				
Measuring range to be set Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	**Y01**	✓	✓[1]	
Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15:	**Y15**	✓	✓	✓
Measuring point text (entry in device variable) Max. 27 characters, specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART address (TAG) Max. 8 characters, specify in plain text: Y17:	**Y17**	✓		
Setting of pressure indication in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H_2O*), inH_2O*), ftH_2O*), mmHG, inHG, psi, Pa, kPa, MPa, g/cm^2, kg/cm^2, Torr, ATM or % *) ref. temperature 20 °C	**Y21**	✓	✓	✓
Setting of pressure indication in non-pressure units[2] Specify in plain text: Y22: ..... up to ..... l/min, m^3/h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	**Y22 + Y01**	✓		

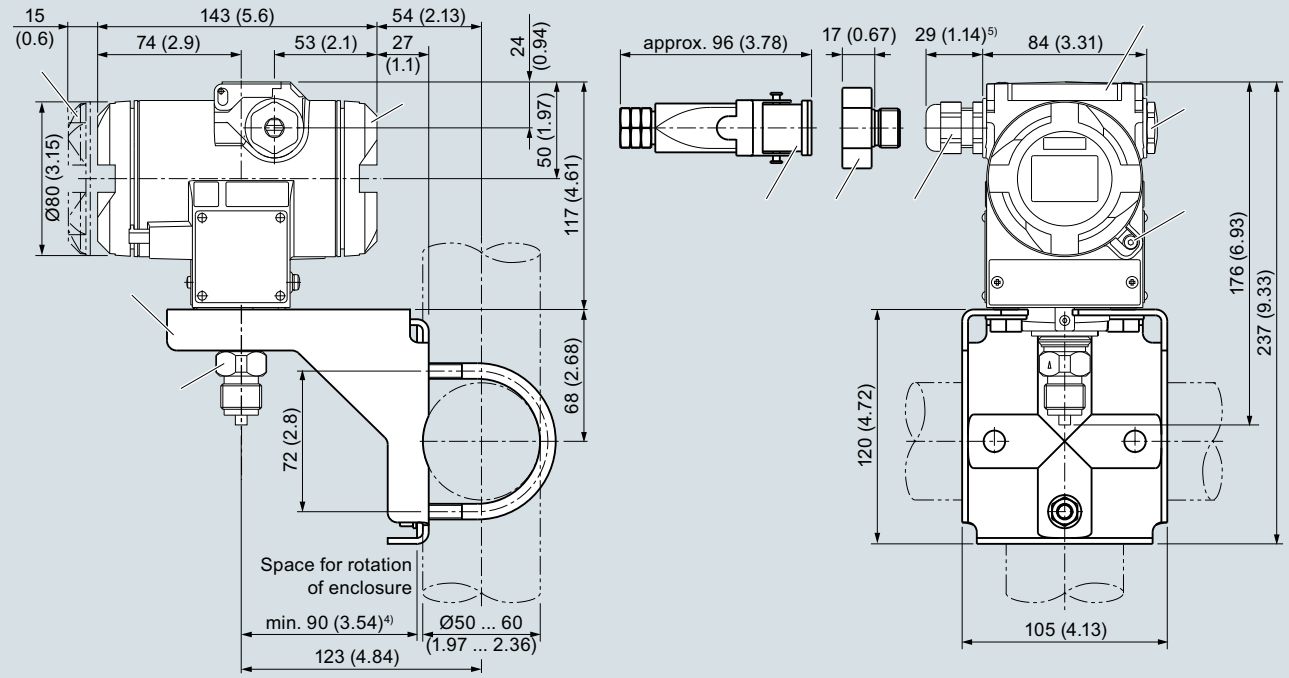
✓ = available

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



1. Electronics side, local display (longer overall length for cover with inspection window)[1]
2. Connection side[1]
3. Electrical connection:
   - Pg 13.5 screw gland (adapter)[2] [3]
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] device plug
4. Harting adapter
5. Cover over buttons
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
8. Process connection: G½B connection pin or oval flange
9. Mounting bracket (optional)

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

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

Technical specifications

SITRANS P410 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)	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**	
	Span	Nominal measuring range	Max. operating pressure MAWP (PS)
	2.5 ... 250 mbar 0.2 ... 25 kPa 1 ... 100 inH_2O	250 mbar 25 kPa 100 inH_2O	160 bar 16 MPa 2320 psi
	6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH_2O	600 mbar 60 kPa 240 inH_2O	
	16 ... 1600 mbar 1.6 ...160 kPa 6.4 ... 642 inH_2O	1600 mbar 160 kPa 642 inH_2O	
	50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH_2O	5000 mbar 500 kPa 2000 inH_2O	
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi	
	6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH_2O	600 mbar 60 kPa 240 inH_2O	420 bar 42 MPa 6091 psi
	16 ... 1600 mbar 1.6 ...160 kPa 6.4 ... 642 inH_2O	1600 mbar 160 kPa 642 inH_2O	
	50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH_2O	5000 mbar 500 kPa 2000 inH_2O	
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi	
Lower measuring limit			
• Measuring cell with silicone oil filling	-100 % of max. span (-33 % with measuring cell 30 bar/3 MPa/435 psi) or 30 mbar a/3 kPa a/0.44 psi a		
Upper measuring limit	100 % of max. span		
Start of scale value	Between the measuring limits (fully adjustable)		
Output	**HART**		**PROFIBUS PA/ FOUNDATION Fieldbus**
Output signal	4 ... 20 mA		Digital PROFIBUS PA and FOUNDATION Fieldbus signal
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-
Load			
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V		-
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)		-
Physical bus	-		IEC 61158-2
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.		
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)		

SITRANS P410 for differential pressure and flow	
Measuring accuracy	Acc. to IEC 60770-1
Reference conditions	• 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 = max. measuring span/set measuring span or nom. pressure range
Error in measurement at limit setting incl. hysteresis and reproducibility	
• Linear characteristic	
- 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	$r \leq 5$: ≤ 0.04 % $5 < r \leq 100$: ≤ (0.004 · r + 0.045) %
• Square-rooted characteristic (flow > 50 %)	
- 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	$r \leq 5$: ≤ 0.04 % $5 < r \leq 100$: ≤ (0.004 · r + 0.045) %
• Square-rooted characteristic (flow > 25 ... 50 %)	
- 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	$r \leq 5$: ≤ 0.08 % $5 < r \leq 100$: ≤ (0.008 · r + 0.09) %
Influence of ambient temperature (in percent per 28 °C (50 °F))	
• 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	≤ (0.025 · r + 0.125) %
Influence of static pressure	
• on the zero point (PKN)	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi	≤ (0.1 · 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	≤ (0.2 · r) % per 70 bar (zero offset is possible with position error adjustment)
• on the span (PKS)	
- 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	≤ 0.14 % per 70 bar
Long-term stability (temperature change ± 30 °C (± 54 °F))	Static pressure max. 70 bar/7 MPa/1015 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	≤ (0.125 · r) % in 5 years
• 30 bar/3 MPa/435 psi	≤ (0.25 · r) % in 5 years
Effect of mounting position (in pressure per change in angle)	≤ 0.7 mbar/0.07 kPa/0.028 inH_2O 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 P410 for differential pressure and flow		
Rated conditions		
Degree of protection		
• according to EN 60529	IP66 (optional IP66/IP68)	
• according to NEMA 250	Type 4X	
Temperature of medium		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) with 30 bar measuring cell	
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
• Ambient temperature		
- Transmitter	-40 ... +85 °C (-40 ... +185 °F)	
- Display readable	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
• Electromagnetic Compatibility		
- Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21	
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-AlSi12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819	
• Process flanges and sealing screw	Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602	
• 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 ¼-18 NPT and flange connection with mounting thread M10 to DIN 19213 or $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518	
Material of mounting bracket		
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)	
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)	
Power supply U_H	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate 24 V power supply necessary	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P410 for differential pressure and flow		
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 13 ATEX 2007 X	
- Marking	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 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 ... 45 V DC	To circuits with values: U_H = 9 ... 32 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 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 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 ... 45 V DC; P_{max} = 1.2 W	To circuits with values: U_H = 9 ... 32 V DC; P_{max} = 1 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 V	U_m = 32 V
- Connection (Ex ic)	To circuits with values: U_i = 45 V	FISCO supply unit ic: U_o = 17.5 V, I_o = 570 mA Linear barrier: U_o = 32 V, I_o = 132 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 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	

for differential pressure and flow

HART communication	
HART	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for PC	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- 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

FOUNDATION Fieldbus communication	
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function

Selection and Ordering data		Article No.	Order Code
SITRANS P410 with HART pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)	↗	**7MF4433-** ■■■■■ - ■■■■	**-Z C41**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring cell filling	**Measuring cell cleaning**		
Silicone oil	normal	**1**	
Measuring span (min. ... max.)			
2.5 ... 250 mbar	(1.004 ... 100.4 inH_2O)	**D**	
6 ... 600 mbar	(2.409 ... 240.9 inH_2O)	**E**	
16 ... 1600 mbar	(6.424 ... 642.4 inH_2O)	**F**	
50 ... 5000 mbar	(20.08 ... 2008 inH_2O)	**G**	
0.3 ... 30 bar	(4.35 ... 435 psi)	**H**	
Wetted parts materials			
(stainless steel process flanges)			
Seal diaphragm	Parts of measuring cell		
Stainless steel	Stainless steel	**A**	
Hastelloy	Stainless steel	**B**	
Hastelloy	Hastelloy	**C**	
Version for diaphragm seal[1) 2) 3) 4)]		**Y**	
Process connection			
Female thread ¼-18 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[5)]			
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		**6**	
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		**4**	
Non-wetted parts materials			
process flange screws	Electronics housing		
Stainless steel	Die-cast aluminum	**2**	
Stainless steel	Stainless steel precision casting[6)]	**3**	
Version			
• Standard version, German plate inscription, setting for pressure unit: bar		**1**	
• International version, English plate inscription, setting for pressure unit: bar		**2**	
• Chinese version, English plate inscription, setting for pressure unit: Pascal		**3**	
All versions include DVD with compact operating instructions in various EU languages.			
Explosion protection			
• None		**A**	
• With ATEX, Type of protection:			
- "Intrinsic safety (Ex ia)"		**B**	
- "Explosion-proof (Ex d)"[7)]		**D**	
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[8)]		**P**	
- "Ex nA/ic (Zone 2)"[9)]		**E**	
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"[8)10)]		**R**	
• FM + CSA intrinsic safe (is) (pending)[11)]		**F**	
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[8)10)11)]		**S**	
• With FM + CSA, Type of protection:			
- "Intrinsic Safe and Explosion Proof (is + xp)"[7)11)]		**N C**	

for differential pressure and flow

Selection and Ordering data	Article No.	Order Code
SITRANS P410 with HART pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)	**7MF4433-** ■■■■■ - ■■■■	**-Z C41**
Electrical connection/cable entry		
• Screwed gland M20 x 1.5	**B**	
• Screwed gland ½-14 NPT	**C**	
• Device plug Han 7D (plastic housing) incl. mating connector[12)13)]	**D**	
• Device plugs M12 (stainless steel)[14)15)]	**F**	
Display		
• Without display	**0**	
• Without visible display (display concealed, setting: mA)	**1**	
• With visible display (setting: mA)	**6**	
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)	**7**	

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

Included in delivery of the device:
- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

1) 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 wiht the transmitter order number, for example 7MF443.-..Y..-.... and 7MF4900-1...-.B

4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.

5) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).

6) Not in conjunction with Electrical connection "device plug Han 7D".

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 or E.

13) Permissible only for crimp-contact of conductor cross-section 1 mm^2

14) Only in connection with Ex approval A, B, E or F.

15) M12 delivered without cable socket.

Selection and Ordering data	Article No.	Order code
Pressure transmitters for differential pressure and flow PN 160 (MAWP 2320 psi)		
SITRANS P410 with PROFIBUS PA (PA)	↗ **7MF4434-** ■■■■■ - ■■■■	**-Z C41**
SITRANS P410 with FOUNDATION Fieldbus (FF)	↗ **7MF4435-** ■■■■■ - ■■■■	**-Z C41**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		

Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	**1**

Nominal measuring range		
250 mbar	(100.4 inH_2O)	**D**
600 mbar	(240.9 inH_2O)	**E**
1600 mbar	(642.4 inH_2O)	**F**
5 bar	(2008 inH_2O)	**G**
30 bar	(435 psi)	**H**

Wetted parts materials (stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	**A**
Hastelloy	Stainless steel	**B**
Hastelloy	Hastelloy	**C**
Version as diaphragm seal [1) 2) 3) 4)]		**Y**

Process connection	
Female thread ¼-18 NPT with flange connection	
• Sealing screw opposite process connection	
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518	**2**
- Mounting thread M10 to DIN 19213 (only for replacement requirement)	**0**
• Venting on side of process flanges [5)]	
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518	**6**
- Mounting thread M10 to DIN 19213 (only for replacement requirement)	**4**

Non-wetted parts materials		
process flange screws	Electronics housing	
Stainless steel	Die-cast aluminum	**2**
Stainless steel	Stainless steel precision casting	**3**

Version	
• Standard version, German plate inscription, setting for pressure unit: bar	**1**
• International version, English plate inscription, setting for pressure unit: bar	**2**
• Chinese version, English plate inscription, setting for pressure unit: Pascal	**3**
All versions include DVD with compact operating instructions in various EU languages.	

Explosion protection	
• None	**A**
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	**B**
- "Explosion-proof (Ex d)"[6)]	**D**
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[7)]	**P**
- "Ex nA/ic (Zone 2)" [8)]	**E**
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[7) 9)] (not for DS III FF)	**R**
• FM + CSA intrinsic safe (is) (pending)[10)]	**F**
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[7)9)10)]	**S**
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)"[8)10)]	**N C**

Electrical connection/cable entry	
• Screwed gland M20 x 1.5	**B**
• Screwed gland ½-14 NPT	**C**
• Device plugs M12 (stainless steel)[11) 12)]	**F**

for differential pressure and flow

Selection and Ordering data	Article No.		Order code
Pressure transmitters for differential pressure and flow PN 160 (MAWP 2320 psi)			
SITRANS P410 with PROFIBUS PA (PA)	**7MF4434-** ■■■■■ - ■■■■		**-Z C41**
SITRANS P410 with FOUNDATION Fieldbus (FF)	**7MF4435-** ■■■■■ - ■■■■		**-Z C41**
Display			
• Without display		**0**	
• Without visible display (display concealed, setting: bar)		**1**	
• With visible display (setting: bar)		**6**	
• With customer-specific display (setting as specified, Order code "Y21" required)		**7**	

Included in delivery of the device:
- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

1) 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 wiht the transmitter order number, for example 7MF443.-..Y..-.... and 7MF4900-1...-.B
4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
5) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).
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, E or F.
12) M12 delivered without cable socket

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:				
• Steel	**A01**	✓	✓	✓
• Stainless steel 304	**A02**	✓	✓	✓
• Stainless steel 316L	**A03**	✓	✓	✓
O-rings for process flanges (instead of FPM (Viton))				
• PTFE (Teflon)	**A20**	✓	✓	✓
• FEP (with silicone core, approved for food)	**A21**	✓	✓	✓
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	**A22**	✓	✓	✓
• NBR (Buna N)	**A23**	✓	✓	✓
Device plugs[1]				
• Han 7D (metal)	**A30**	✓		
• Han 8D (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
• Han 8D (metal)	**A33**	✓		
Sealing screws (2 units) ¼-18 NPT, with valve in mat. of process flanges	**A40**	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))	**A50**	✓	✓	✓
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
English rating plate Pressure units in inH_2O and/or psi	**B21**	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2[2]	**C11**	✓	✓	✓
Inspection certificate[3] to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate to EN 10204-2.2	**C14**	✓	✓	✓
Acceptance certificate (EN 10204-3.1) PMI test of parts in contact with medium	**C15**	✓	✓	✓
Functional safety (SIL2) (pending) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C20**	✓		
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C23**	✓		
Increased measuring accuracy (mandatory specification for SITRANS P410)	**C41**	✓	✓	✓
PED for Russia with initial calibration mark	**C99**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	✓		
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	**D07**	✓	✓	✓
Degree of protection IP66/IP68 (only for M20 x 1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Supplied with oval flange set (2 items), PTFE packings and screws in thread of process flanges	**D37**	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	**D59**	✓	✓	✓
TAG plate empty (no inscription)	**D61**	✓	✓	✓
Use in or on zone 1D/2D[4] (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-.B.. Ex ia)"and IP66)	**E01**	✓	✓	✓
Dual seal	**E24**	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-.B..)	**E55**[5]	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-.D..)	**E56**[5]	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.E..)	**E57**[5]	✓	✓	✓
Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.R..)	**E58**[5]	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (pending) (only for transmitter 7MF4...-.....-.[B, D]..-Z + E11)	**E70**[5]	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)	**E80**	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)	**E81**	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	**E82**	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	**E83**	✓	✓	✓
Two coats of lacquer on casing and cover (PU on epoxy)	**G10**	✓	✓	✓
Interchanging of process connection side	**H01**	✓	✓	✓
Vent on side for gas measurements	**H02**	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines (not together with K01, K02 and K04)[6]	**H03**	✓	✓	✓

for differential pressure and flow

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Transient protector 6 kV (lightning protection)	**J01**	✓	✓	✓
Chambered graphite gasket for process flange	**J02**	✓	✓	✓
Chambered PTFE graphite gasket	**J03**	✓	✓	✓
EPDM O-rings for process flange with approval (WRC/WRAS)	**J05**	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)[7]	**J08**	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)[7]	**J09**	✓	✓	✓
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	**S10**	✓	✓	✓
• Lloyds Register (LR)	**S11**	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	**S12**	✓	✓	✓
• American Bureau of Shipping (ABS)	**S14**	✓	✓	✓
• Russian Maritime Register (RMR)	**S16**	✓	✓	✓
• Korean Register of Shipping (KR)	**S17**	✓	✓	✓

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).

✓ = available

1) Device plug Han IP65
2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
3) If the 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) 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.
6) Not suitable for connection of remote seal.
7) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

Selection and Ordering data	Order code	HART	PA	FF
Additional data Please add "**-Z**" to Article No. and specify Order code(s) and plain text.				
Measuring range to be set Specify in plain text:				
• in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	**Y01**	✓	✓[1]	
• in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	**Y02**	✓		
Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15:	**Y15**	✓	✓	✓
Measuring point text (entry in device variable) Max. 27 char., specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART address (TAG) Max. 8 char., specify in plain text: Y17:	**Y17**	✓		
Setting of pressure indicator in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm $H_2O^{*)}$, in$H_2O^{*)}$, ft$H_2O^{*)}$, mmHG, inHG, psi, Pa, kPa, MPa, g/cm², kg/cm², Torr, ATM or % *) ref. temperature 20 °C	**Y21**	✓	✓	✓
Setting of pressure indicator in non-pressure units[2] Specify in plain text: Y22: ..... up to ..... l/min, m³/h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)	**Y22[3] + Y01** *or* **Y02**	✓		
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	**Y25**		✓	✓
Damping adjustment in seconds (0 ... 100 s)	**Y30**	✓	✓	✓

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

✓ = available

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

Selection and Ordering data		Article No.	Order code
SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)	↗	**7MF4533-**	**-Z C41**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring cell filling	**Measuring cell cleaning**		
Silicone oil	normal	1	
Measuring span (min. ... max.)			
6 ... 600 mbar	(2.4 ... 240 inH_2O)	E	
16 ... 1600 mbar	(6.4 ... 642 inH_2O)	F	
50 ... 5000 mbar	(20 ... 2000 inH_2O)	G	
0.3 ... 30 bar	(4.35 ... 435 psi)	H	
Wetted parts materials			
(stainless steel process flanges)			
Seal diaphragm	Parts of measuring cell		
Stainless steel	Stainless steel	A	
Hastelloy	Stainless steel	B	
Version for diaphragm seal [1) 2) 3) 4)]		Y	
Process connection			
Female thread ¼-18 NPT with flange connection			
• Sealing screw opposite process connection			
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		3	
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		1	
• Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing)			
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		7	
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		5	
Non-wetted parts materials			
process flange screws	Electronics housing		
Stainless steel	Die-cast aluminum	2	
Stainless steel	Stainless steel precision casting[5)]	3	
Version			
• Standard version, German plate inscription, setting for pressure unit: bar		1	
• International version, English plate inscription, setting for pressure unit: bar		2	
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3	
All versions include DVD with compact operating instructions in various EU languages.			
Explosion protection			
• None		A	
• With ATEX, Type of protection:			
- "Intrinsic safety (Ex ia)"		B	
- "Explosion-proof (Ex d)"[6)]		D	
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[7)]		P	
- "Ex nA/ic (Zone 2)"[8)]		E	
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"[7)9)]		R	
• FM + CSA intrinsic safe (is) (pending)[10)]		F	
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[7)9)10)]		S	
• With FM + CSA, Type of protection:			
- "Intrinsic safety and explosion-proof (is + xp)" [6)10)], max PN 360		N	C
Electrical connection/cable entry			
• Screwed gland M20x1.5			B
• Screwed gland ½-14 NPT			C
• Device plug Han 7D (plastic housing) incl. mating connector[11) 12)]			D
• Device plugs M12 (stainless steel)[13)14)]			F

for differential pressure and flow

Selection and Ordering data	Article No.	Order code
SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)	**7MF4533-** ▢▢▢▢▢ - ▢▢▢▢	**-Z C41**
Display		
• Without display	**0**	
• Without visible display (display concealed, setting: mA)	**1**	
• With visible display (setting: mA)	**6**	
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)	**7**	

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

Scope of delivery: Pressure transmitter as ordered (Instruction Manual is extra ordering item)

1) 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 wiht the transmitter order number, for example 7MF453.-..Y..-.... and 7MF4900-1....-.B
4) The standard measuring cell filling for 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) Permissible only for crimp-contact of conductor cross-section 1 mm^2
13) Only in connection with Ex approval A, B, E or F.
14) M12 delivered without cable socket.

Selection and Ordering data		Article No.	Order Code
Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)			
SITRANS P410 with PROFIBUS PA (PA)		↗ **7MF4534-** ■■■■■ - ■■■■	**-Z C41**
SITRANS P410 with FOUNDATION Fieldbus (FF)		↗ **7MF4535-** ■■■■■ - ■■■■	**-Z C41**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring cell filling	**Measuring cell cleaning**		
Silicone oil	normal	**1**	
Nominal measuring range			
600 mbar	(240 inH_2O)	**E**	
1600 mbar	(642 inH_2O)	**F**	
5 bar	(2000 inH_2O)	**G**	
30 bar	(435 psi)	**H**	
Wetted parts materials			
(stainless steel process flanges)			
Seal diaphragm	Parts of measuring cell		
Stainless steel	Stainless steel	**A**	
Hastelloy	Stainless steel	**B**	
Version for diaphragm seal [1) 2) 3) 4)]		**Y**	
Process connection			
Female thread ¼-18 NPT with flange connection			
• Sealing screw opposite process connection			
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		**3**	
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		**1**	
• Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing).			
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		**7**	
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		**5**	
Non-wetted parts materials			
Process flange screws	Electronics housing		
Stainless steel	Die-cast aluminum	**2**	
Stainless steel	Stainless steel precision casting	**3**	
Version			
• Standard version, German plate inscription, setting for pressure unit: bar		**1**	
• International version, English plate inscription, setting for pressure unit: bar		**2**	
• Chinese version, English plate inscription, setting for pressure unit: Pascal		**3**	
All versions include DVD with compact operating instructions in various EU languages.			
Explosion protection			
• None		**A**	
• With ATEX, Type of protection:			
- "Intrinsic safety (Ex ia)"		**B**	
- "Explosion-proof (Ex d)"[5)]		**D**	
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[6)]		**P**	
- "Ex nA/ic (Zone 2)" [7)]		**E**	
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[6)8)]		**R**	
• FM + CSA intrinsic safe (is) (pending)[9)]		**F**	
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[6)7)9)]		**S**	
• With FM + CSA, Type of protection:			
- "Intrinsic safety and explosion-proof (is + xp)"[6)9)], max PN 360		**N**	**C**
Electrical connection/cable entry			
• Screwed gland M20 x 1.5			**B**
• Screwed gland ½-14 NPT			**C**
• Device plugs M12 (stainless steel) [10) 11)]			**F**

for differential pressure and flow

Selection and Ordering data	Article No.		Order Code
Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)			
SITRANS P410 with PROFIBUS PA (PA)	**7MF4534-** ■■■■■ - ■■■■		**-Z C41**
SITRANS P410 with FOUNDATION Fieldbus (FF)	**7MF4535-** ■■■■■ - ■■■■		**-Z C41**
Display			
• Without (display hidden)		**0**	
• Without visible display (display concealed, setting: bar)		**1**	
• With visible display (setting: bar)		**6**	
• With customer-specific display (setting as specified, Order code "Y21" required)		**7**	

Included in delivery of the device:
- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

1) 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 wiht the tranmitter order number, for example 7MF453.-..Y..-.... and 7MF4900-1....-.B
4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
5) Without cable gland, with blanking plug.
6) With enclosed cable gland Ex ia and blanking plug.
7) Configurations with device plugs Han and M12 are only available in Ex ic.
8) Only in connection with IP66.
9) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
10) Only in connection with Ex approval A, B, E or F.
11) M12 delivered without cable socket

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:				
• Steel	**A01**	✓	✓	✓
• Stainless steel 304	**A02**	✓	✓	✓
• Stainless steel 316L	**A03**	✓	✓	✓
O-rings for process flanges (instead of FPM (Viton))				
• PTFE (Teflon)	**A20**	✓	✓	✓
• FEP (with silicone core, approved for food)	**A21**	✓	✓	✓
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	**A22**	✓	✓	✓
• NBR (Buna N)	**A23**	✓	✓	✓
Device plugs[1]				
• Han 7D (metal)	**A30**	✓		
• Han 8D (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
• Han 8D (metal)	**A33**	✓		
Sealing screws (2 units) ¼-18 NPT, with valve in mat. of process flanges	**A40**	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))	**A50**	✓	✓	✓
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
English rating plate Pressure units in inH_2O and/or psi	**B21**	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	**C11**	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	**C14**	✓	✓	✓
Functional safety (SIL2) (pending) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C20**	✓		
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C23**	✓		
Increased measuring accuracy (mandatory specification for SITRANS P410)	**C41**	✓	✓	✓
PED for Russia with initial calibration mark	**C99**	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	✓		
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	**D07**	✓	✓	✓
Degree of protection IP66/IP68 (only for M20 x 1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	**D59**	✓	✓	✓
TAG plate empty (no inscription)	**D61**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Use in or on zone 1D/2D[2] (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-.B.. Ex ia)"and IP66)	**E01**	✓	✓	✓
Dual seal	**E24**	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-.B..)	**E55**[3]	✓	✓	✓
Ex prot. "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-.D..)	**E56**[3]	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.E..)	**E57**[3]	✓	✓	✓
Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.R..)	**E58**[3]	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (pending) (only for transmitter 7MF4...-.....-.[B, D]..-Z + E11)	**E70**[3]	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)	**E80**	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)	**E81**	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	**E82**	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	**E83**	✓	✓	✓
Two coats of lacquer on casing and cover (PU on epoxy)	**G10**	✓	✓	✓
Interchanging of process connection side	**H01**	✓	✓	✓
Vent on side for gas measurements	**H02**	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines	**H03**	✓	✓	✓
Transient protector 6 kV (lightning protection)	**J01**	✓	✓	✓
Chambered graphite gasket for process flange	**J02**	✓	✓	✓
Chambered PTFE graphite gasket	**J03**	✓	✓	✓
EPDM O-rings for process flange with approval (WRC/WRAS)	**J05**	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)[4]	**J08**	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)[4]	**J09**	✓	✓	✓
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	**S10**	✓	✓	✓
• Lloyds Register (LR)	**S11**	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	**S12**	✓	✓	✓
• American Bureau of Shipping (ABS)	**S14**	✓	✓	✓
• Russian Maritime Register (RMR)	**S16**	✓	✓	✓
• Korean Register of Shipping (KR)	**S17**	✓	✓	✓

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) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.
3) 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.
4) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

for differential pressure and flow

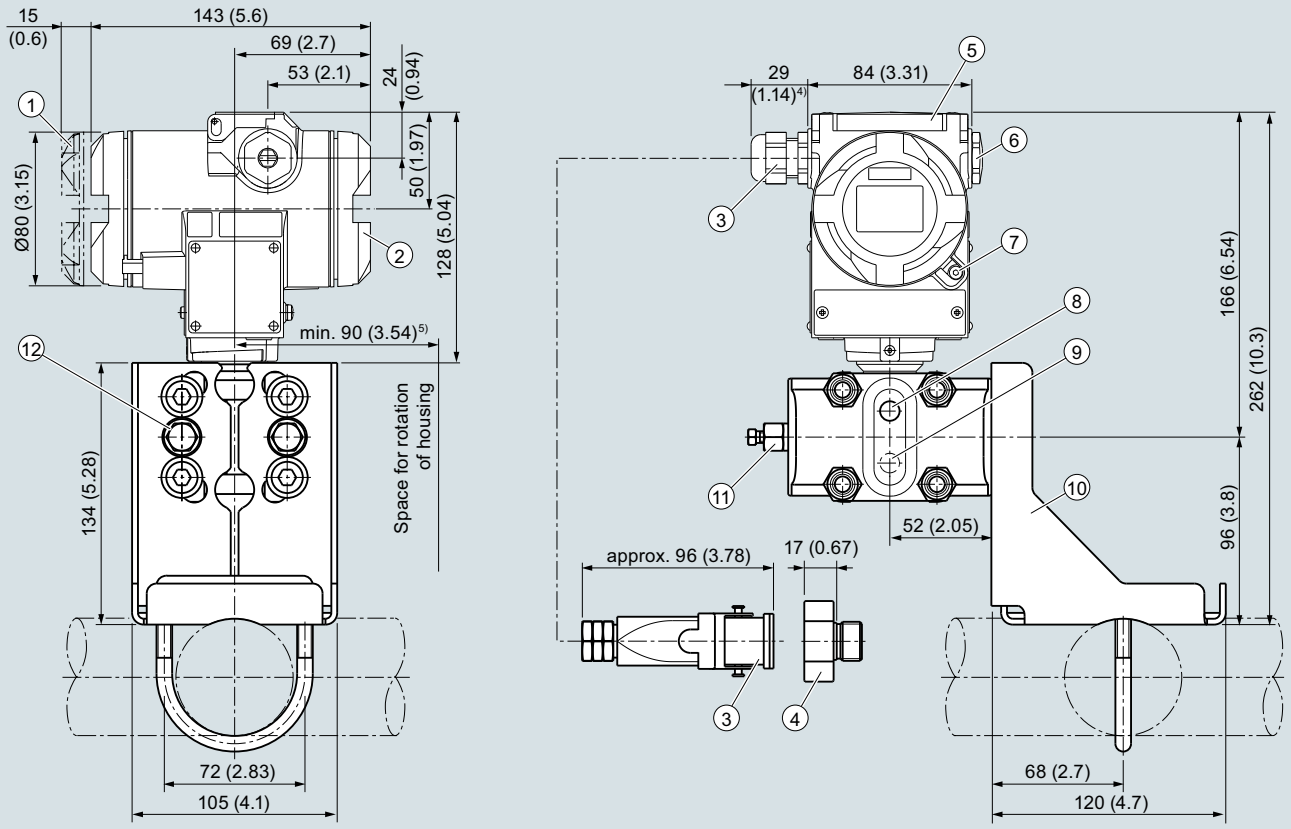
Selection and Ordering data	Order code	HART	PA	FF
Additional data				
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.				
Measuring range to be set				
Specify in plain text:				
• in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	**Y01**	✓	✓[1]	
• in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	**Y02**	✓		
Stainless steel tag plate and entry in device variable (measuring point description)	**Y15**	✓	✓	✓
Max. 16 characters, specify in plain text: Y15:				
Measuring point text (entry in device variable)	**Y16**	✓	✓	✓
Max. 27 char., specify in plain text: Y16:				
Entry of HART address (TAG)	**Y17**	✓		
Max. 8 char., specify in plain text: Y17:				
Setting of pressure indication in pressure units	**Y21**	✓	✓	✓
Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ...				
Note: The following pressure units can be selected: bar, mbar, mm H_2O*), inH_2O*), ftH_2O*), mmHG, inHG, psi, Pa, kPa, MPa, g/cm^2, kg/cm^2, Torr, ATM or % *) ref. temperature 20 °C				
Setting of pressure indication in non-pressure units[2]	**Y22 + Y01** *or* **Y02**	✓		
Specify in plain text: Y22: ..... up to ..... l/min, m^3/h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)				
Preset bus address	**Y25**		✓	✓
possible between 1 and 126				
Specify in plain text: Y25:				
Damping adjustment in seconds (0 ... 100 s)	**Y30**	✓	✓	✓

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

✓ = available

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

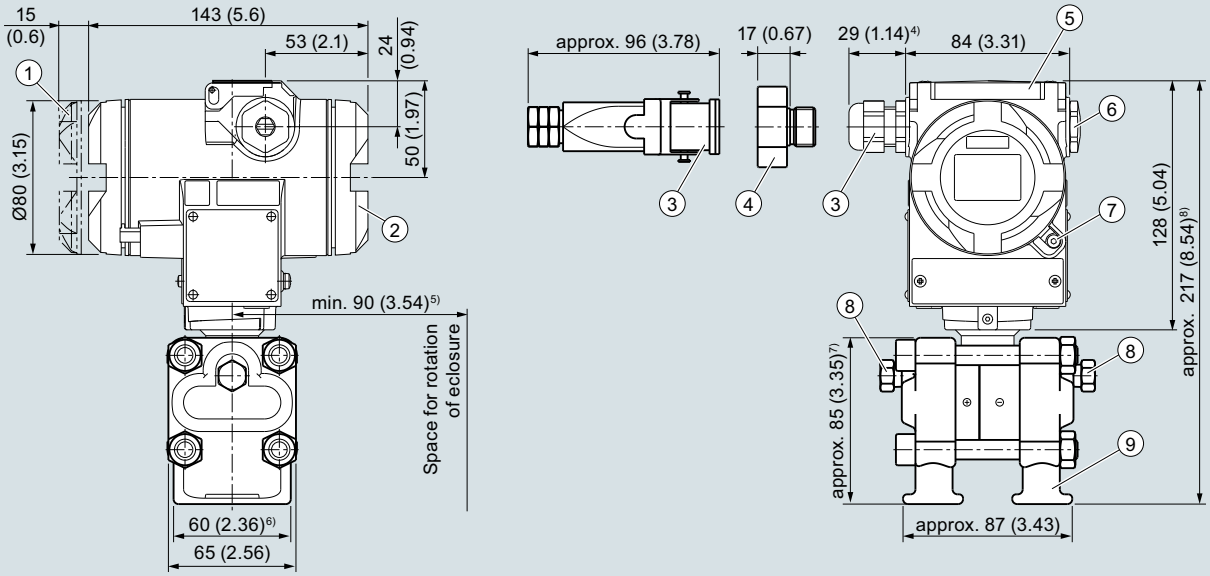
Dimensional drawings



1. Electronics side, local display (longer overall length for cover with inspection window)[1]
2. Connection side[1]
3. Electrical connection:
   - Pg 13.5 screw gland (adapter)[2] [3]
   - M20 x 1,5 screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] device plug
4. Harting adapter
5. Cover over buttons
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
8. Lateral ventilation for liquid measurement (Standard)
9. Lateral ventilation for gas measurement (order option H02)
10. Mounting bracket (optional)
11. Sealing plug with valve (optional)
12. Process connection: ¼-18 NPT (IEC 61518)

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

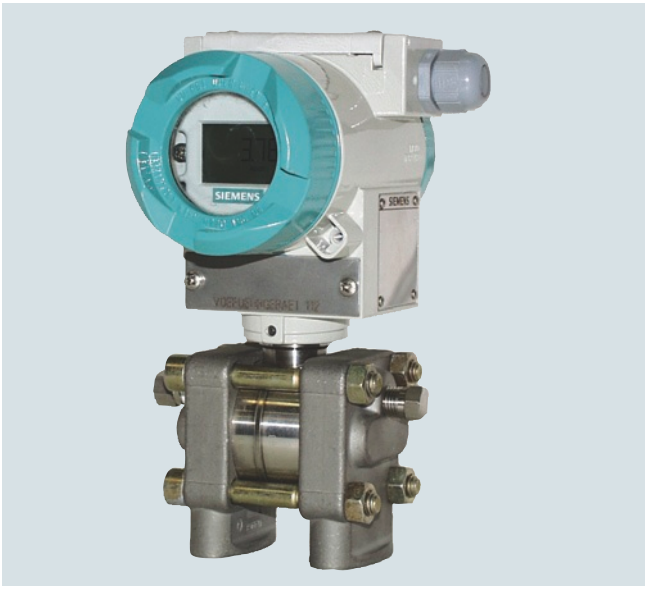
SITRANS P410 pressure transmitters for differential pressure and flow, dimensions in mm (inch)



1. Electronics side, local display (longer overall length for cover with inspection window)[1)]
2. Connection side[1)]
3. Electrical connection:
   - Pg 13.5 screw gland (adapter)[2) 3)]
   - M20 x 1,5 screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2) 3)] device plug
4. Harting adapter
5. Cover over buttons
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
8. Sealing plug with valve (optional)
9. Process connection: ¼-18 NPT (IEC 61518)

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

SITRANS P410 pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines, optional "H03" , dimensional drawing, dimensions in mm (inch)



SITRANS P410 pressure transmitters for differential pressure and flow, with process covers for vertical differential pressure lines

Selection and Ordering data	Article No.
Accessories/Spare parts	
Mounting bracket and fastening parts for pressure transmitters	
SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF403.-.....-..C.)	
• made of steel	**7MF4997-1AB**
• made of stainless steel 304/1.4301	**7MF4997-1AH**
• made of stainless steel 316L/1.4404	**7MF4997-1AP**
Mounting bracket and fastening parts for pressure transmitters	
SITRANS P410 with HART, P410 with PROFIBUS PA and P10with FOUNDATION Fieldbus (7MF403-.....-..A., -..B., ..D. and ..F.)	
• made of steel	**7MF4997-1AC**
• made of stainless steel 304/1.4301	**7MF4997-1AJ**
• made of stainless steel 316L/1.4404	**7MF4997-1AQ**
Mounting and fastening brackets For differential pressure transmitters with flange thread M10	
SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF443.-...)	
• made of steel	**7MF4997-1AD**
• made of stainless steel 304/1.4301	**7MF4997-1AK**
• made of stainless steel 316L/1.4404	**7MF4997-1AR**
Mounting and fastening brackets For differential pressure transmitters with flange thread M12	
SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF453.-...)	
• made of steel	**7MF4997-1AE**
• made of stainless steel 304/1.4301	**7MF4997-1AL**
• made of stainless steel 316L/1.4404	**7MF4997-1AS**
Mounting and fastening brackets For differential pressure transmitters with flange thread 7/16 -20 UNF	
SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF443.-... and 7MF453.-...)	
• made of steel	**7MF4997-1AF**
• made of stainless steel 304/1.4301	**7MF4997-1AM**
• made of stainless steel 316L/1.4404	**7MF4997-1AT**
Cover	
Made of die-cast aluminum, including gasket, for SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus. Compatible for Ex and non-Ex transmitters	
• without window	**7MF4997-1BB**
• with window	**7MF4997-1BE**
Cover	
Made of stainless steel, including gasket, or SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus. Compatible for Ex and non-Ex transmitters	
• without window	**7MF4997-1BC**
• with window	**7MF4997-1BF**
Digital indicator Including mounting material, for SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus	**7MF4997-1BR**
Measuring point label	
• without inscription (5 units)	**7MF4997-1CA**
• Printed (1 unit) Data according to Y01 or Y02, Y15, Y16 and Y99 (see "Pressure transmitters")	**7MF4997-1CB-Z Y..: .....**

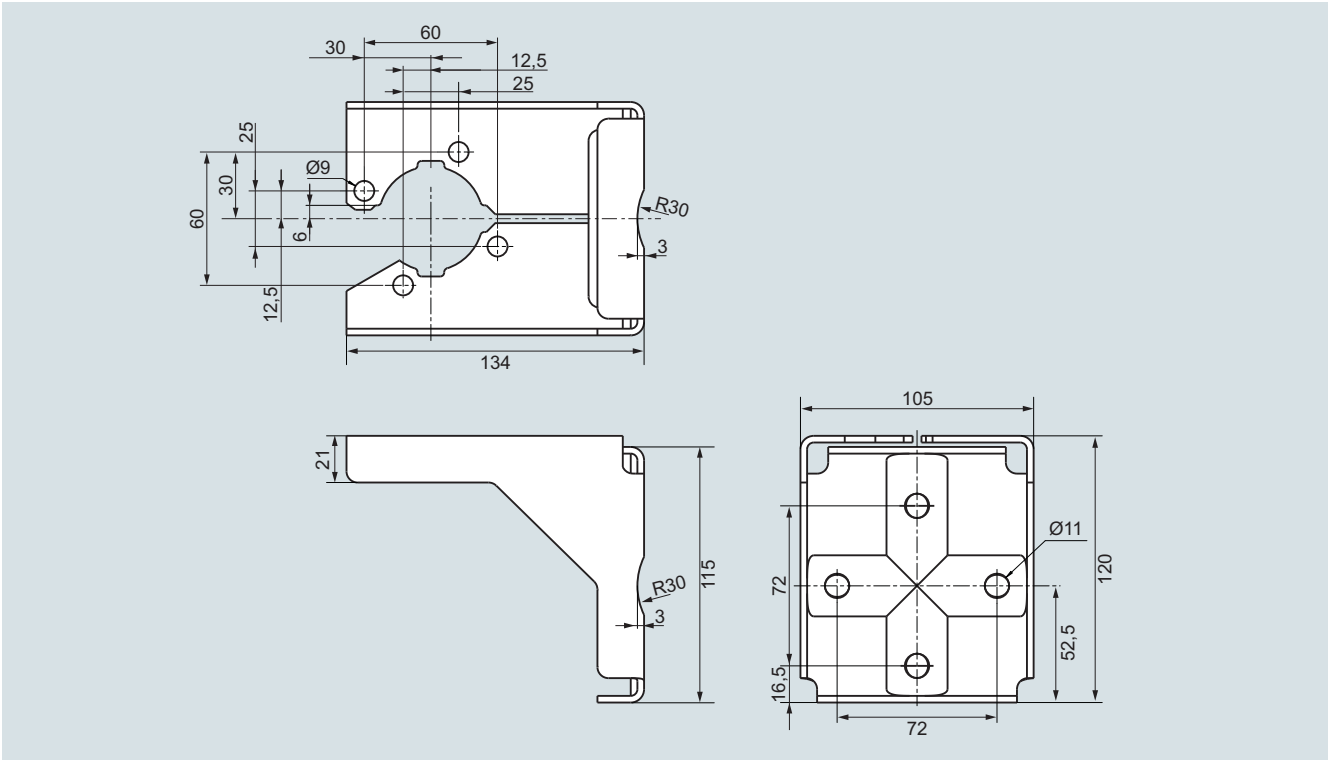
Selection and Ordering data	Article No.
Mounting screws For measuring point label, grounding and connection terminals or for display (50 units)	**7MF4997-1CD**
Sealing screws (1 set = 2 units) for process flange	
• made of stainless steel	**7MF4997-1CG**
• made of Hastelloy	**7MF4997-1CH**
Sealing screws with vent valve Complete (1 set = 2 units)	
• made of stainless steel	**7MF4997-1CP**
• made of Hastelloy	**7MF4997-1CQ**
Connection board	
• for SITRANS P410	**7MF4997-1DN**
• for SITRANS P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus	**7MF4997-1DP**
O-rings for process flanges made of:	
• FPM (Viton)	**7MF4997-2DA**
• PTFE (Teflon)	**7MF4997-2DB**
• FEP (with silicone core, approved for food)	**7MF4997-2DC**
• FFPM (Kalrez)	**7MF4997-2DD**
• NBR (Buna N)	**7MF4997-2DE**
Sealing ring for process connection	**see "Fittings"**

Accessories/Spare parts

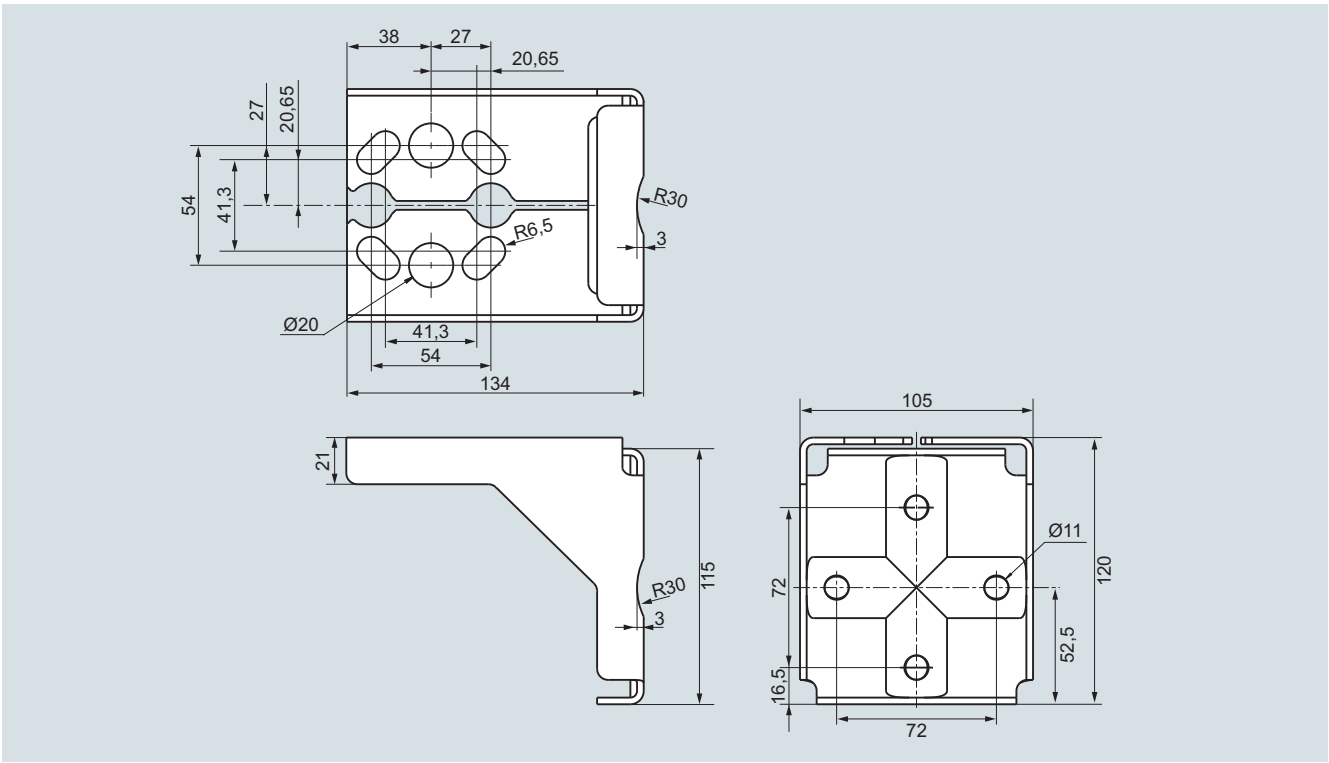
Selection and Ordering data	Article No.
Documentation	
The entire documentation is available for download free-of-charge in various languages at: http://www.siemens.com/processinstrumentation/documentation	
Compact operating instructions SITRANS P DS III/P410	
• English, German, Spanish, French, Italian,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

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

Dimensional drawings



Mounting bracket for SITRANS P410 gauge pressure-transmitters, dimensions in mm
mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)



Mounting bracket for SITRANS P410 differential pressure transmitter, dimensions in mm
mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)