SIEMENS

SITRANS™ P, DS III Series

Transmitters for Pressure, Absolute Pressure, Differential Pressure, Flow and Level

SITRANS P, DS III Series

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Introduction

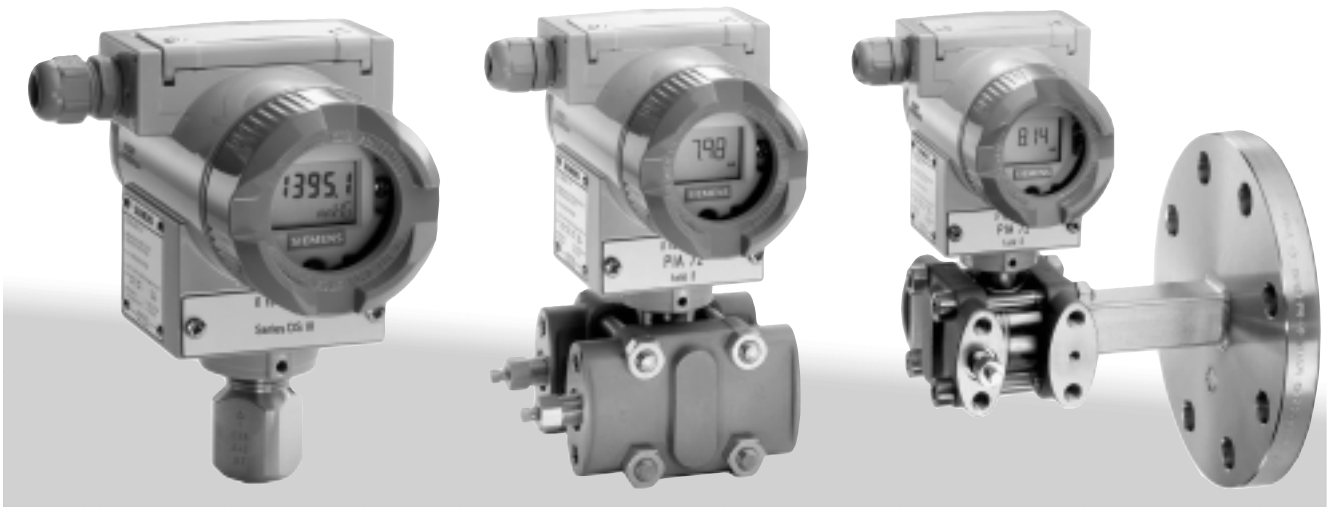


Fig. 1 SITRANS P transmitters, DS III series for pressure, absolute pressure, differential pressure, flow and level, with visible digital display

Application

All versions of the SITRANS P transmitter, DS III series, are two-wire transmitters. The output signal is a load-independent direct current of 4 to 20 mA linearly proportional to the input pressure.

Transmitters conforming to the type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or zone 0. The transmitters are provided with an EU prototype test certificate and comply with the corresponding harmonized European standards of the CENELEC.

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 transmitters can be programmed locally using three input keys or externally via HART. The following table describes the fundamental parameters. Further parameters for special applications are accessible via HART.

Elements for configuration of transmitter

Configuration using	Input keys	HART communication
Start-of-scale value	●	●
Full-scale value	●	●
Electric damping	●	●
Start-of-scale value without application of a pressure ("Blind setting")	●	●
Full-scale value without application of a pressure ("Blind setting")	●	●
Zero adjustment (correction of position)	●	●
Current transmitter	●	●
Fault current	●	●
Disabling of keys, write protection	●	● [1]
Type of dimension and actual dimension	●	●
Characteristic (linear, square-rooted)	● [2]	● [2]
Diagnostics - Event counter - Slave pointer - Maintenance timer - Simulation functions		●

[1]) Cancel apart from write protection

[2]) Only differential pressure

● Possible

Transmitter for pressure

This type of transmitter measures the pressure of corrosive and non-corrosive gases, vapors and liquids. Spans range from 0.15 psi to 5800 psi.

Pressure limit of medium for pressure transmitters

Span	Upper pressure limit of medium
0.15 to 14.5 psi	87 psi
0.60 to 60 psi	145 psi
2.3 to 230 psi	464 psi
9 to 915 psi	1459 psi
23 to 2325 psi	3626 psi
58 to 5800 psi	8700 psi

Transmitter for absolute pressure

This type of transmitter measures the absolute pressure of corrosive and non-corrosive gases, vapors and liquids.

Two series are available:

- "Pressure" series
- "Differential pressure" series

The "Differential pressure" series has a higher process pressure limit.

Spans range from 3.3" H_2O to 2325 psi .

Process pressure limit of medium for absolute pressure transmitters from the "Pressure" series (7MF4233)

Span	Upper pressure limit
3.3" to 100 " H_2O (abs.)	87 psi
18" to 525" H_2O (abs.)	145 psi
64" to 2000" H_2O (abs.)	425 psi
400" to 12,000" H_2O (abs.)	1450 psi

Process pressure limit for absolute pressure transmitters from the "Differential pressure" series (7MF4333)

Span	Upper pressure limit
3.3" to 100 " H_2O (abs.)	464 psi
18" to 525" H_2O (abs.)	464 psi
64" to 2000" H_2O (abs.)	464 psi
400" to 12,000" H_2O (abs.)	2325 psi
77 psi to 2325 psi (abs.)	2325 psi with pressure flange screws M10
	3625 psi with pressure flange screws $^7/_{16}$-20 UNF

Transmitter for differential pressure and flow

This type of transmitter is used to measure

- the differential pressure
- a small positive or negative pressure
- the flow q ~ $\sqrt{Dp}$ (together with a primary differential pressure device)

Spans range from 0.4" H_2O to 435 psi.

Process pressure limit for differential pressure and flow transmitters

Span	Upper pressure limit (nominal pressure)	
	PN (7MF4433)	PN (7MF4533)
0.4" to 8" H_2O	464 psi	-
0.4" to 24" H_2O	2325 psi	-
1.0" to 100" H_2O	2325 psi	6090 psi
2.4" to 240" H_2O	2325 psi	6090 psi
6.4" to 640" H_2O	2325 psi	6090 psi
20" to 2000" H_2O	2325 psi	6090 psi
120" to 12,0000" H_2O	2325 psi	6090 psi

Transmitter for level

This type of transmitter with mounting flange measures the level of corrosive and non-corrosive liquids in open or closed containers. Spans range between 10" H_2O and 2000" H_2O. The nominal mounting flange diameter is 3 or 4 inch.

In the case of level measurements in open containers, the low-pressure connection of the measuring cell remains open (measurement with respect to atmosphere), while for measurements in closed containers, this connection must be connected to the container in order to compensate the static pressure.

The wetted parts are constructed from a variety of materials depending on the degree of corrosion resistance required.

Process pressure limit level transmitters

Span	Upper pressure limit of medium (nominal pressure)
10" to 100" H_2O	See mounting flange on page 17
10" to 240" H_2O	See mounting flange on page 17
20" to 640" H_2O	See mounting flange on page 17
64" to 2000" H_2O	See mounting flange on page 17

Introduction

Design and mode of operation

The SITRANS P transmitter, DS III series, is immediately ready for operation following installation. The adjustable span corresponds to the data on the rating plate. If a customer-specific setting is made in the factory, the zero and full-scale values are printed on the rating plate.

If necessary, the parameters can also be changed during commissioning using simple input operations on the transmitter.

Design

The transmitter consists of various components depending on the customer-specific order. The possible versions are listed in the ordering information.

The rating plate (3, Fig. 2) with the Order No. is located on the side of the housing. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

The approval label is located on the opposite side.

The housing is made of die-cast aluminium or stainless steel precision casting. A round cover is screwed on at the front and rear. The front cover (6) can be fitted with a viewing pane so that the measured values can be read directly on the digital display. The inlet (4) to the electrical junction box is located either on the left or right side. The unused opening in each case is sealed by a blanking plug. The protective earth connection is located on the rear of the housing.

The electrical junction box for the power supply and screen is accessible by unscrewing the rear cover. The bottom part of the housing contains the measuring cell with process connection (1). This is protected from rotating by a locking screw (8). The modular design of the SITRANS P, DS III series, means that the measuring cell and electronics can be replaced if necessary.

At the top of the housing is a plastic cover (5). The input keys are located underneath this cover.

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

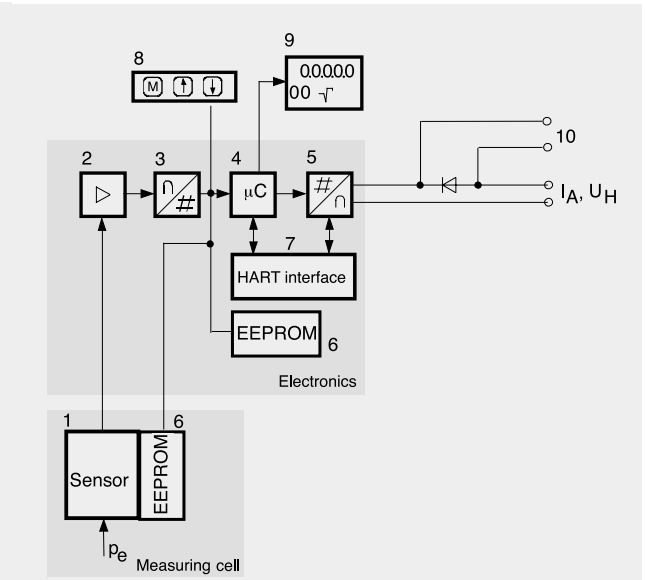
Fig. 2 SITRANS P transmitter for pressure, DS III series, front view

Mode of operation

Mode of operation of the electronics

The input variable is converted by the sensor (1, Fig. 3) into an electric signal which is amplified by the instrument amplifier (2) and digitized in an 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 the output current of 4 to 20 mA. A diode circuit (10) protects against incorrect polarity. The data specific to the measuring cell, the electronics data, and the parameter data are stored in two non-volatile memories (6). The first memory is coupled to the measuring cell, the second to the electronics. Thus the electronic unit is independent of the measuring cell if replacement of either is required.

The three input keys (8) can be used to directly parameterize the transmitter at the position of measurement, and also to view results, error messages and operating modes on the digital display (9). The HART modem (7) permits configuration using a protocol according to the HART specification.



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

Fig. 3 SITRANS P transmitter, DS III series, electronics

Introduction

SITRANS P transmitter, DS III series, for pressure

The pressure p_e is applied via the process connection (2, Fig. 4) to the measuring cell (1). It is transmitted further via the process diaphragm (3) and the filling liquid (4) to the silicon pressure sensor (5) whose measuring diaphragm is then flexed. The resistance of four piezo-resistors fitted in the diaphragm in a bridge circuit thus changes. This change in resistance results in a bridge output voltage proportional to the input pressure.

The pressure transmitters with spans < 915 psi measure the input pressure compared to atmospheric, transmitters with spans >915 psi compared to a vacuum.

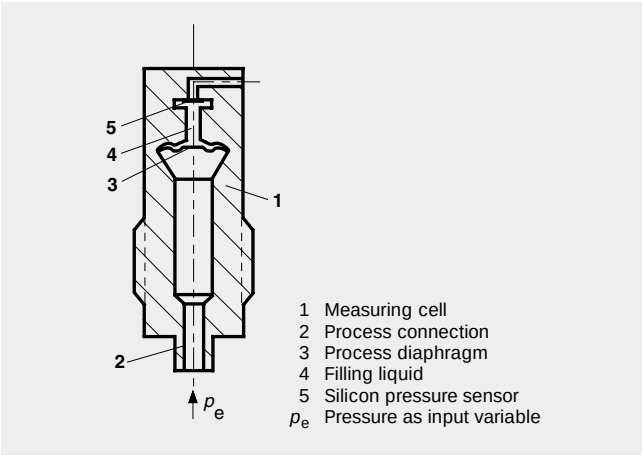


Fig. 4 Measuring cell for pressure, functional diagram

SITRANS P transmitter, DS III series, for absolute pressure, from the pressure series

The absolute pressure is transmitted via the process diaphragm (3, Fig. 5) and the filling liquid (4) to the silicon absolute pressure sensor (5) whose measuring diaphragm is then flexed. The resistance of four piezo-resistors fitted in the diaphragm in a bridge circuit thus changes. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

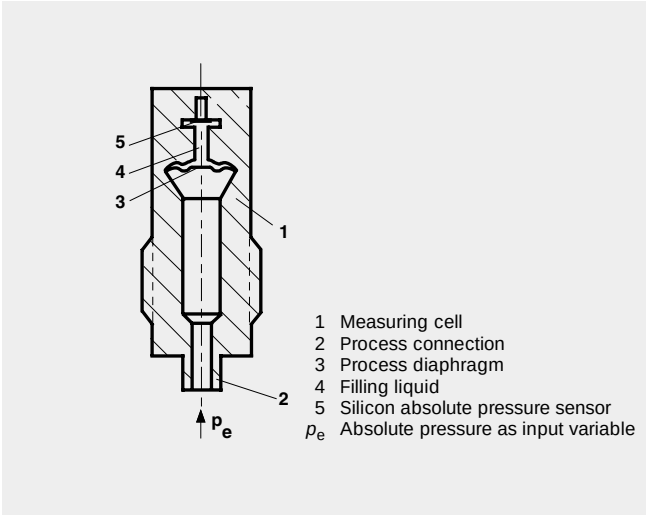


Fig. 5 Measuring cell for absolute pressure from the pressure series, functional diagram

SITRANS P transmitter, DS III series, for absolute pressure, from the differential pressure series

The absolute pressure is transmitted via the process diaphragm (6, Fig. 6) and the filling liquid (8) to the silicon pressure sensor (3). If the measuring limits are exceeded, the overload diaphragm (2) is flexed until the process diaphragm rests on the body of the measuring cell (7), thus protecting the silicon pressure sensor from overloads. The difference in pressure between the input pressure (p_e) and the reference vacuum (1) on the low-pressure side of the measuring cell flexes the measuring diaphragm. The resistance of four piezo-resistors fitted in the diaphragm in a bridge circuit thus changes. This change in resistance results in a bridge output voltage proportional to the absolute pressure.

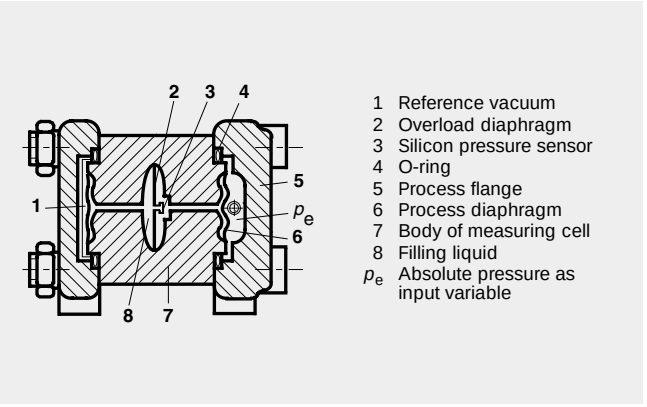


Fig. 6 Measuring cell for absolute pressure from differential pressure series, functional diagram

SITRANS P transmitter, DS III series, for differential pressure and flow

The differential pressure is transmitted via the process diaphragms (1, Fig. 7) and the filling liquid (7) to the silicon pressure sensor (4). If the measuring limits are exceeded, the overload diaphragm (3) is flexed until one of the process diaphragms rests on the body of the measuring cell (6), thus protecting the silicon pressure sensor from overloads. The measuring diaphragm is flexed by the applied differential pressure. The resistance of four piezo-resistors fitted in the diaphragm in a bridge circuit thus changes. This change in resistance results in a bridge output voltage proportional to the differential pressure.

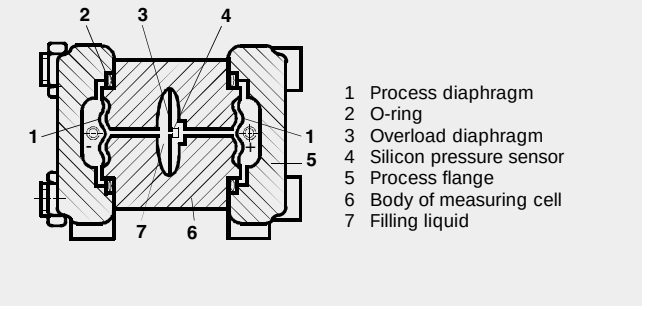
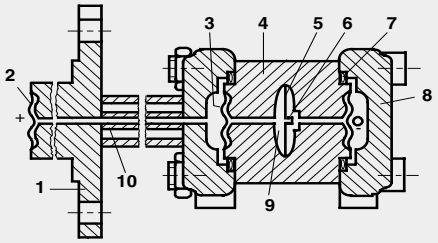


Fig. 7 Measuring cell for differential pressure and flow, functional diagram

Introduction

SITRANS P transmitter, DS III series, for flow

The input pressure (hydrostatic pressure) acts hydraulically on the measuring cell via the process diaphragm on the mounting flange (2, Fig. 8). The differential pressure applied to the measuring cell is transmitted via the seal diaphragm (3) and the filling liquid (9) to the silicon pressure sensor (6). If the measuring limits are exceeded, the overload diaphragm (5) is flexed until the process diaphragm rests on the measuring cell body (4), thus protecting the silicon pressure sensor from overloading. The measuring diaphragm is flexed by the differential pressure. The resistance of four piezo-resistors fitted in the diaphragm in a bridge circuit thus changes. This change in resistance results in a bridge output voltage proportional to the differential pressure.



1 Flange with tube
2 Process diaphragm on mounting flange
3 Process diaphragm
4 Body of measuring cell
5 Overload diaphragm
6 Silicon pressure sensor
7 O-ring
8 Process flange
9 Filling liquid
10 Capillary with filling liquid of mounting flange

Fig. 8 Measuring cell for flow, functional diagram

Configuration

Depending on the version, there are different possibilities for configuring the transmitter and for setting or scanning the parameters.

Configuration using the input keys (local operation)

The input keys can be used to simply set the most important parameters without any additional equipment.

Configuration using HART communication

When configuring with the HART communicator, the connection is made directly to the two-wire system (Fig. 9). When parameterizing with a laptop or PC, the connection is made via a HART modem (Fig. 10).

The signals required for communication according to the HART protocol 5.x are superimposed on the output current according to frequency shift keying (FSK).

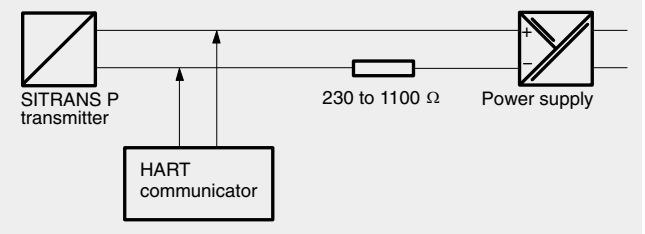


Fig. 9 Communication between HART communicator and transmitter

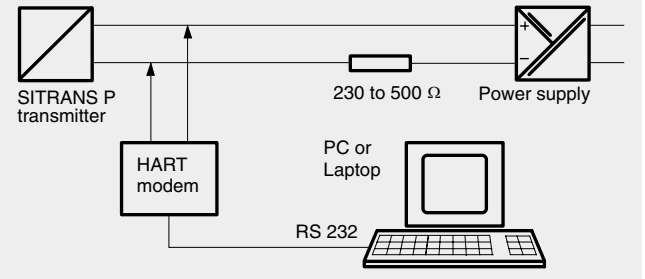


Fig. 10 Communication between PC or laptop and transmitter

Technical data

SITRANS P, DS III series, for	Pressure 7MF4033	Absolute pressure: Pressure transmitter series 7MF4233	Absolute pressure: Differential pressure transmitter series 7MF4333	Differential pressure and flow 7MF4433/ 7MF4533	Level 7MF4633
Application	See page 2				
Mode of operation Measuring principle	See page 4 Piezo-resistive				
Input					
Measured variable	Pressure	Absolute pressure		Differential pressure and flow	Level
Measuring range					
• Span (continuously adjustable)	0.15 psi to 5800 psi	3.3" H_2O (abs.) to 435 psi (abs.)	3.3" H_2O (abs.) to 2325 psi (abs.)		10" to 2000" H_2O
- Max static pressure 470 psi				0.4" to 8" H_2O	
- Max static pressure 2325 psi				0.4" H_2O to 435 psi	
- Max static pressure 6090 psi				1" H_2O to 435 psi	
• Lower measuring limit					
- Measuring cell with silicone oil filling	-14.5 psi	0" H_2O (absolute)		-100 % of max. span or 12" H_2O (absolute)	-100 % of max. span or 12" H_2O (abs.) depending on mounting flange
- Measuring cell with inert filling liquid					
For process temperature -20 °C (-4°F) < ϑ ≤ 60 °C (140°F)	12" H_2O				
For process temperature +60 °C (140°F) < ϑ ≤ 100 °C (212°) (max. +85 °C (185°F) for 435 psi measuring cell)	12" H_2O (abs.) + 8" H_2O (abs.) · (ϑ - 60 °C)/°C (or -76°F/°F)				
• Upper measuring limit	100 % of max. span (max. 2325 psi with oxygen measurement and inert filling liquid)				100 % of max. span
• Zero (continuously adjustable)	Between the measuring limits				
Output Output signal	4 to 20 mA				
• Lower limit (continuously adjustable)	3.55 mA, factory-set to 3.84 mA				
• Upper limit (continuously adjustable)	23.0 mA, factory-set to 20.5 mA or optional 22.0 mA				
• Ripple (without HART communication)	I_{pp} ≤ 0.5 % of max. output current				
• Electric damping					
- Adjustable time constant (T_{63})	0 to 100 s in steps of 0.1 s, factory-set to 0.1 s				
• Current transmitter	Adjustable from 3.55 to 23 mA				
• Signal on alarm	Adjustable from 3.55 to 23 mA				
Load					
• Without HART communication	R_B ≤ (U_H - 10.5 V) / 0.023 A in Ω, U_H: power supply in V				
• With HART communication	R_B = 230 to 500 Ω (HART modem) / 230 to 1100 Ω (HART communicator)				
Characteristic	Linear rising or falling			or square-rooted	
Accuracy					
Reference conditions	Positive going, zero-based, stainless steel process diaphragm (with level: mounting flange without tube), silicone oil fill and room temperature (25 °C) r = max. span/set span = span ratio				
Error in measurement with fixed-point setting (including hysteresis and repeatability)					
- Linear characteristic					
r ≤ 10	≤ 0.1 %				≤ 0.15 %
10 < r ≤ 30	≤ 0.2 %				≤ 0.3 %
30 < r ≤ 100	≤ (0.005 · r + 0.05 %)			≤ (0.005 · r + 0.05 %)	≤ (0.0075 · r + 0.075 %)
- Square-root characteristic					
Flow > 50 %				≤ 0.1 % at r ≤ 10 ≤ 0.2 % at 10 < r ≤ 30	
Flow 25 to 50 %				≤ 0.2 % at r ≤ 10 ≤ 0.4 % at 10 < r ≤ 30	
• Repeatability	Included in error in measurement				
• Hysteresis	Included in error in measurement				

Transmitters for pressure, absolute pressure, differential pressure, flow and level

Technical data

SITRANS P, DS III series, for	Pressure 7MF4033	Absolute pressure: Pressure transmitter series 7MF4233	Absolute pressure: Differential pressure transmitter series 7MF4333	Differential pressure and flow 7MF4433/ 7MF4533	Level 7MF4633
Response time (T_{63}, without electric damping)	Approx. 0.2 s	Approx. 0.2 s		Approx. 0.2 s, approx. 0.3 s with 8" H_20 and 24" H_2O measuring cells	Approx. 0.2 s
Long-term drift per 12 months	≤ (0.1 · r) %	≤ (0.2 · r) %		≤ (0.1 · r) %	
- 8" H_2O measuring cell				≤ (0.2 · r) %	
Ambient temperature					
• At -10 to +60 °C (14 to 140°F)	≤ (0.1 · r + 0.2) %[1]				
- 100" H_2O measuring cell					≤ (0.5 · r + 0.2)[2] %
- 240" H_2O measuring cell					≤ (0.3 · r + 0.2)[2] %
- 640" H_2O and 2000" H_2O measuring cells					≤ (0.25 · r + 0.2)[2] %
• At -40 to -10 °C (-40 to 14°F) and +60 to +85 °C (140 to 185°F)	≤ (0.1 · r + 0.15) % / 10 K[1]				
- 100" H_2O measuring cell					≤ (0.25 · r + 0.15)[3] % / 10 K
- 240" H_2O measuring cell					≤ (0.15 · r + 0.15)[3] % / 10 K
- 640" H_2O and 2000" H_2O measuring cells					≤ (0.12 · r + 0.15)[3] % / 10 K
Influence of static pressure					
• On zero				≤ (0.15 · r) % per 1450 psi	
- 8" H_2O measuring cell				≤ (0.15 · r) % per 465 psi	
- 100" H_2O measuring cell					≤ (0.3 · r) % per nominal pres. (PN)
- 240" H_2O measuring cell					≤ (0.15 · r) % per nominal pres. (PN)
- 640" H_2O and 2000" H_2O meas. cell					≤ (0.1 · r) % per nominal pres. (PN)
• On span				≤ 0.2 % per 1450 psi	≤ (0.1 · r) % per nominal pres. (PN)
- 8" H_2O measuring cell				≤ 0.2 % per 465 psi	
Influence of mounting position	≤ 0.02" H_2O per 10° inclination	≤ 0.28" H_2O per 10° inclination			Dependent on filling liquid in mounting flange
Influence of power supply	0.005 % per 1 V change in voltage				
Rated operating conditions					
Installation conditions					
• Installation instructions	Process connection pointing vertically downwards	Any mounting position			Defined by flange
Ambient conditions					
• Ambient temperature (observe temperature class in potentially explosive atmospheres)					
- Measuring cell with silicone oil filling	-40 to +85 °C (-40 to 185°F)				
30-bar measuring cell		-20 to +85 °C (-4 to 185°F)			
- Measuring cell with inert filling liquid	-20 to +85 °C (-4 to 185°F)				
- Digital display	-30 to +85 °C (-22 to 185°F)				
• Ambient temperature limits	See ambient temperature				
• Storage temperature	-50 to +85 °C (-58 to 185°F)				
• Climate class					
- Condensation	Permissible				
• Degree of protection (to EN 60 529)	IP 65				
• Electromagnetic compatibility					
- Emitted interference	To EN 50 081-1				
- Noise immunity	To EN 50 082-2 and NAMUR NE 21				

[1] Twice the value with 8" measuring cell.
[2] 0.4 instead of 0.2 for 10 < r ≤ 30.
[3] Twice the value for 10 < r ≤ 30.

Technical data

SITRANS P, DS III series, for	Pressure 7MF4033	Absolute pressure		Differential pressure and flow 7MF4433/ 7MF4533	Level 7MF4633
		Pressure transmitter series 7MF4233	Differential pressure transmitter series 7MF4333		
Medium conditions					
• Process temperature					
- Measuring cell with silicone oil filling	-40 to +100 °C (-40 to 212°F)				High-press. side: see mounting flange Low-press. side: -40 to +100 °C (-40 to 212°F)
435 psi measuring cell			-40 to +85 °C (-40 to 185°F) (-20 to +85 °C (-4 to 185°F) for 7MF4533)		
- Measuring cell with inert filling liquid	-20 to +100 °C (-4 to 212°F)				
435 psi measuring cell			-20 to +85 °C (-4 to 185°F)		
• Process temperature limits	See process temperature				
• Process pressure limits	See page 3			Nominal pressure (PN)	
Design					
Weight (without options)	Approx. 3.3 lbs		Approx. 9.9 lbs		
• To DIN (transmitter with mounting flange, without extension)					Approx. 24.2 lbs to 28.6 lbs
• To ANSI (transmitter with mounting flange, without extension)					Approx. 24.2 lbs to 28.6 lbs
Dimensions	See Fig. 12		See Fig. 13	See Fig. 14	See Fig. 15
Material					
• Wetted parts materials					
- Connection shank	Stainless steel, mat. No. 1.4401 or Hastelloy C4, mat. No. 2.4610				
- Oval flange	Stainless steel, mat. No. 1.4401				
- Process diaphragm	Stainless steel, mat. No. 1.4404 or Hastelloy C276, mat. No. 2.4819		Stainless steel, mat. No. 1.4404, Hastelloy C276, mat. No. 2.4819, Monel, mat. No. 2.4360, tantalum or gold		
- Process flanges and sealing screw			Stainless steel, mat. No. 1.4408, Hastelloy C4, mat. No. 2.4610 or Monel, mat. No. 2.4360		
- O-ring			FPM (Viton) or as option: PTFE, FEP, FEPM and NBR		
- High-pressure side					
Process diaphragm of mounting flange					Stainl. st., mat. No. 1.4571, Monel 400, mat. No. 2.4360, Hastelloy B2, mat. No. 2.4617, Hastelloy C276, mat. No. 2.4819, Hastelloy C4, mat. No. 2.4610, tantalum, PTFE, ECTFE
Sealing face					Smooth to DIN 2526 form D or ANSI B16.5 RF for stainl. steel, mat. No. 1.4571, DIN 2526 form E or ANSI B16.5 RFSF for other materials
- Sealing material in the process flanges					
for standard applications					Viton
for vacuum application of mounting flange					Copper
- Low-pressure side					
Process diaphragm					Stainless steel, mat. No. 1.4404
Process flanges and sealing screw					Stainless steel, mat. No. 1.4408
Connection shank					Stainless steel, mat. No. 1.4401
O-ring					FPM (Viton)

Transmitters for pressure, absolute pressure, differential pressure, flow and level

Technical data

SITRANS P, DS III series, for	Pressure 7MF4033	Absolute pressure		Differential pressure and flow 7MF4433/ 7MF4533	Level 7MF4633
		Pressure transmitter series 7MF4233	Differential pressure transmitter series 7MF4333		
• Non-wetted parts materials					
- Electronics housing	Die-cast aluminium, low in copper, GD-ALSi 12, or stainless steel precision casting, polyester-based "epoxy", stainless steel rating plate				
- Process flange screws			Steel, galvanized and yellow-passivated, or stainless steel		
- Mounting bracket (option)	Steel, galvanized and yellow-passivated, or stainless steel				
Measuring cell filling	Silicone oil or inert filling liquid (max. 2325 psi with oxygen measurement)				Silicone oil
• Filling liquid of mounting flange					Silicone oil or other material
Process connection	Connection shank G $^1/_2$ A to DIN 16 288, female thread $^1/_2$ - 14 NPT or oval flange (PN 160) with mounting thread M10 or 7/16-20 UNF		Female thread $^1/_4$ - 18 NPT and flange connection to DIN 19 213 with mounting thread M10 (M12 for PN 420) or 7/16-20 UNF		
• High-pressure side					Flange to DIN and ANSI
• Low-pressure side					Female thread $^1/_4$- 18 NPT and flange connection to DIN 19 213 with mounting thread M10 or 7/16-20 UNF
Electrical connection	Screw terminals, cable inlet via screwed gland Pg 13.5 (adapter), M20 x 1.5 or $^1/_2$- 14 NPT, or Han 7D/Han 8U plug				
Displays and controls					
Input keys	3 for local programming directly on transmitter				
Digital display	Built-in, cover with window (option)				
Power supply (U_H)					
Terminal voltage on transmitter	DC 10.5 to 45 V and DC 10.5 to 30 V in intrinsically-safe mode				
Ripple	$U_{pp} \leq 0.2$ V (47 to 125 Hz)				
Noise	$U_{rms} \leq 1.2$ mV (0.5 to 10 kHz)				
Certificates and approvals	Exclusively decisive are the data in the official EU prototype test certificate and the respectively valid supplements				
CENELEC	To DIN EN 50 014: 1997, EN 50 020: 1994 and EN 50 284: 1999				
• Intrinsic safety	Ⓔx II $^1/_2$ G EEx ia/ib IIC/IIB T6				
- EU prototype test certificate	PTB 99 ATEX 2122				
- Max. ambient temperature	+85 ˚C (185˚F) temperature class T4; +70 ˚C (158˚F) temperature class T5; +60 ˚C (140˚F) temperature class T6				
- Connection to certified intrinsically-safe circuits with maximum values	U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω				
- Effective internal inductance	L_i = 0.25 mH				
- Effective internal capacitance	C_i = 6 nF				
• Explosion-proof	Ⓔx II $^1/_2$ G EEx d IIC T4 / T6				
- Conformity certificate	PTB 99 ATEX 1160				
- Max. ambient temperature	+85 ˚C (185˚F) temperature class T4 +60 ˚C (140˚F) temperature class T6				
• Ex-approved zone 2	planned				
- Registration number					
FMRC (Factory Mutual Research Corp.)					
• Intrinsic safety and explosion-proof	3008490 (3610, 3615)				
• Explosion-proof	For class I, division, 1, groups A, B, C and D				
• Dust-ignition proof	For class II, div. 1, groups E, F and G, indoor and outdoor (NEMA 4X) hazardous (classified) locations				
• Intrinsically safe	With entity, for use in class I, div. 1, group A, B, C, D, E, F and G, indoor and outdoor (NEMA 4X) hazardous (classified) locations				
- Entity parameters	V_{max} = 30 V; I_{max} = 100 mA; L_i = 0.4 mH; C_i = 5nF				
CSA (Certificate of Compliance)	No. 1153651 (LR104225); Class 2258 02 ans Class 2258 03				
Communication Load when connecting a					
• HART communicator	230 to 1100 Ω				
• HART modem	230 to 500 Ω				
Cable	2-wire screened: ≤ 3.0 km, multi-core screened: ≤ 1.5 km				
Protocol	HART, version 5.x				
PC/laptop requirements	IBM-compatible, main memory > 32 Mbyte, hard disk > 70 Mbyte, RS 232 interface, VGA graphics				
Software for PC/laptop	Windows 95 / 98 / NT 4.0 and SIMATIC PDM				

Ordering data 7MF4033

Ordering data — Order No.

SITRANS P transmitter for pressure, two-wire system, DS III series

7MF4033- ■■■■■ - ■■■■

Meas. cell filling	Meas. cell cleaning	
Silicone oil	Normal	1
Inert liquid	Grease-free	3

Span

0.15	to	1 5 psi	B
0.6	to	60 psi	C
2.3	to	230 psi	D
9.0	to	925 psi	E
23	to	2325 psi	F
58	to	5800 psi	G

Wetted parts materials

Process diaphragm	Connection shank	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version for remote seal		Y 0

Process connection

- Connection shank $G^1/_2$ A — 0
- Female thread $^1/_2$ - 14 NPT — 1
- Oval flange and connection shank made of stainless steel, max. span 2325 psi
  - Mounting thread $^7/_{16}$- 20 UNF — 2
  - Mounting thread M10 — 3

Non-wetted parts materials

- Housing made of die-cast aluminium — 0
- Housing stainl. steel precision casting — 3

Design

- Standard version — 1
- International version (available soon), English label inscriptions, documentation in 5 languages on CD — 2

Explosion protection

- Without explosion protection — A
- With explosion protection (CENELEC) Type of protection:
  - "Intrinsic safety" (EEx ia) — B
  - "Explosion-proof" (EEx d) [1] — D
  - "Intrinsic safety and explosion-proof" (EEx ia and EEx d) [1] (planned) — P
- Use in zone 2 (planned) — E
- With explosion protection
  - FM intrinsically safe and explosion-proof — H C
  - CSA intrisically safe and exposion-proof — L C
  - FM and CSA intrinsically safe and explosion-proof — N C

Electrical connection/ cable inlet

- Screwed gland Pg 13.5 [2] — A
- Screwed gland M20 x 1.5 — B
- Screwed gland $^1/_2$ - 14 NPT — C
- Han 7D plug [2] — D

Indicator

- Without indicator (digital display hidden, setting: mA) — 1
- With indicator (digital display visible, setting: mA) — 6
- With indicator (digital display visible, setting as specified, Order code Y21 required) — 7

Ordering data — Order code

Further designs	
Please add **"Z"** to Order No. and specify Order code(s).	
Transmitter with mounting bracket made of	
• Steel	**A01**
• Stainless steel	**A02**
Han 7D plug (metal, gray)	**A30**
Han 8U plug (instead of Han 7D)	**A31**
Rating plate inscription (instead of German)	
• English	**B11**
• French	**B12**
• Spanish	**B13**
• Italian	**B14**
Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 8402	**C11**
Acceptance test certificate B to DIN 50 049/EN 10 204-3.1 B	**C12**
Factory certificate to DIN 50 049-2.2/ EN 10 204-2.2	**C14**
Setting of upper limit of output signal to 22.0 mA	**D05**
Acid gas version to NACE (only together with seal diaphragm made of Hastelloy)	**D07**
IP 68 (not together with Han 7D/Han 8U plug, Pg 13.5 screwed gland and measuring cells ≤ 925 psi)	**D12**
Use in zone 0 (basic unit EEx ia)	**E02**
Oxygen application (max. 2325 psi with oxygen measurement and inert filling liquid)	**E10**
Additional information	
Please add **"Z"** to Order No. and specify Order code(s) and plain text.	
Measuring range to be set, specify in plain text:	
Y01: ... to ... psi, inches H_2O, feet H_2O, ...	**Y01**
Measuring-point number/identification (max. 16 characters), specify in plain text:	
Y15:	**Y15**
Measuring-point text (max. 27 characters), specify in plain text:	
Y16:	**Y16**
Setting for digital display, specify in plain text:	
Y21: psi, inches H_2O, feet H_2O, ...	**Y21**
Note on Y21	
The following pressure dimensions can be selected:	
bar, mbar, mm H_2O*), in H_2O*), ft H_2O*), mm HG, in HG, psi, Pa, kPa, MPa, g/cm^2, kg/cm^2, mA, Torr, ATM or % (*) reference temperature 20 °C)	

Only the settings for "Y01", "Y21" and "D05" can be made in the factory.

Example for ordering:

Item line 1:	7MF4033-1EA00-1AA7-Z
B line:	A01 + Y01 + Y21
C line	Y01: 145 to 290 psi
C line	Y21: psi

[1] Without cable gland.
[2] Not together with type of protection "Explosion-proof".

Transmitters for absolute pressure (from pressure transmitter series)

Ordering data
7MF4233

Ordering data — Order No.

SITRANS P transmitter for absolute pressure, from pressure transmitter series, two-wire system, DS III series

7MF4233- ■■■■■ - ■■■■

Meas. cell filling	Meas. cell cleaning	
Silicone oil	Normal	1
Inert liquid	Grease-free	3

Span

3.3"	to	100" H_2O (abs.)	D
17"	to	525" H_2O (abs.)	F
64"	to	2000" H_2O (abs.)	G
400"	to	12,000" H_2O (abs.)	H

Wetted parts materials

Process diaphragm	Parts of meas. cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version for remote seal [1])		Y 0

Process connection

- Connection shank $G^1/_2$ A — 0
- Female thread $^1/_2$ - 14 NPT — 1
- Oval flange and connection shank made of stainless steel, max. span 2325 psi
  - Mounting thread $^7/_{16}$ - 20 UNF — 2
  - Mounting thread M10 — 3

Non-wetted parts materials

- Housing made of die-cast aluminium — 0
- Housing stainl. steel precision casting — 3

Design

- Standard version — 1
- International version (available soon), English label inscriptions, documentation in 5 languages on CD — 2

Explosion protection

- Without explosion protection — A
- With explosion protection (CENELEC) Type of protection:
  - "Intrinsic safety" (EEx ia) — B
  - "Explosion-proof" (EEx d) [2]) — D
  - "Intrinsic safety and explosion-proof" (EEx ia and EEx d) [2]) (planned) — P
- Use in zone 2 (planned) — E
- With explosion protection
  - FM intrinsically safe and explosion-proof — H C
  - CSA intrisically safe and exposion-proof — L C
  - FM and CSA intrinsically safe and explosion-proof — N C

Electrical connection/ cable inlet

- Screwed gland Pg 13.5 [3]) — A
- Screwed gland M20 x 1.5 — B
- Screwed gland $^1/_2$ - 14 NPT — C
- Han 7D plug [3]) — D

Indicator

- Without indicator (digital display hidden, setting: mA) — 1
- With indicator (digital display visible, setting: mA) — 6
- With indicator (digital display visible, setting as specified, Order code Y21 required) — 7

Ordering data — Order code

Further designs	
Please add **"Z"** to Order No. and specify Order code(s).	
Transmitter with mounting bracket made of	
• Steel	**A01**
• Stainless steel	**A02**
Han 7D plug (metal, gray)	**A30**
Han 8U plug (instead of Han 7D)	**A31**
Rating plate inscription (instead of German)	
• English	**B11**
• French	**B12**
• Spanish	**B13**
• Italian	**B14**
Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 8402	**C11**
Acceptance test certificate B to DIN 50 049/EN 10 204-3.1 B	**C12**
Factory certificate to DIN 50 049-2.2/ EN 10 204-2.2	**C14**
Setting of upper limit of output signal to 22.0 mA	**D05**
Acid gas version to NACE (only together with seal diaphragm made of Hastelloy)	**D07**
IP 68 (not together with Han 7D/Han 8U plug, Pg 13.5 screwed gland)	**D12**
Use in zone 0 (basic unit EEx ia)	**E02**
Oxygen application (max. 2325 psi with oxygen measurement and inert filling liquid)	**E10**
Additional information	
Please add **"Z"** to Order No. and specify Order code(s) and specify in plain text.	
Measuring range to be set, specify in plain text:	
Y01: ... to ... psi, inches H_2O, feet H_2O, ...	**Y01**
Measuring-point number/identification (max. 16 characters), specify in plain text:	
Y15:	**Y15**
Measuring-point text (max. 27 characters), specify in plain text:	
Y16:	**Y16**
Setting for digital display, specify in plain text:	
Y21: psi, inches H_2O, feet H_2O, ...	**Y21**
(see "Additional information" on page 11 for pressure dimensions selectable for "Y21")	

Only the settings for "Y01", "Y21" and "D05" can be made in the factory.

Example for ordering: see page 11

[1]) Version 7MF4233-1DY... only up to max. span 80" H_2O.
[2]) Without cable gland.
[3]) Not together with type of protection "Explosion-proof".

Transmitters for absolute pressure (from differential pressure transmitter series)

Ordering data 7MF4333

Ordering data — Order No.

SITRANS P transmitter for absolute pressure, from differential pressure transmitter series, two-wire system, DS III series

7MF4333- ■■■■■ - ■■■■

Meas. cell filling	Meas. cell cleaning	
Silicone oil Inert liquid	Normal Grease-free	1 3

Span

3.3"	to	100" H_2O (abs.)	D
18"	to	525" H_2O (abs.)	F
64"	to	2000" H_2O (abs.)	G
400"	to	12,000" H_2O (abs.)	H
77 psi	to	2325 psi	K E

Wetted parts materials

Process diaphragm	Parts of meas. cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Tantalum	Tantalum	E
Monel	Monel	H
Gold [1]	Gold	L
Version for remote seal [2]		Y

Process connection

Female thread $^1/_4$ - 18 NPT with flange connection to DIN 19 213

- With sealing screw opposite process connection
  - Mounting thread M10 — 0
  - Mounting thread $^7/_{16}$ - 20 UNF — 2
- Sealing screw on side of process flanges [3]
  - Mounting thread M10 — 4
  - Mounting thread $^7/_{16}$ - 20 UNF — 6

Non-wetted parts materials

Process flange screws	Electronics housing	
Steel	Die-cast aluminium	0
Stainless steel	Die-cast aluminium	2
Stainless steel	Stain. steel prec. cast.	3

Design

- Standard version — 1
- International version (available soon), English label inscriptions, documentation in 5 languages on CD — 2

Explosion protection

- Without explosion protection — A
- With explosion protection (CENELEC) Type of protection:
  - "Intrinsic safety" (EEx ia) — B
  - "Explosion-proof" (EEx d) [4] — D
  - "Intrinsic safety and explosion-proof" (EEx ia +EEx d) [4] (planned) — P
- Use in zone 2 (planned) — E
- With explosion protection
  - FM intrinsically safe & explosion-proof — H C
  - CSA intrisically safe & explosion-proof — L C
  - FM and CSA intrinsically safe and explosion-proof — N C

Electrical connection/cable inlet

- Screwed gland Pg 13.5 [5] — A
- Screwed gland M20 x 1.5 — B
- Screwed gland $^1/_2$ - 14 NPT — C
- Han 7D plug [5] — D

Indicator

- Without indicator (digital display hidden, setting: mA) — 1
- With Indicator (digital display visible, setting: mA) — 6
- With indicator (digital display visible, setting as specified, Order code Y21 required) — 7

Ordering data — Order code

Further designs	
Please add **"Z"** to Order No. and specify Order code(s).	
Transmitter with mounting bracket made of • Steel • Stainless steel	 **A01** **A02**
Instead of FPM (Viton), process flange O-ring made of: • PTFE (Teflon) • FEP (with silicone core, approved for food) • FFPM (Kalrez) • NBR (Buna N)	 **A20** **A21** **A22** **A23**
Han 7D plug (metal, gray) Han 8U plug (instead of Han 7D)	**A30** **A31**
Sealing screws ($^1/_4$ - 18 NPT) with valve in material of process flange	**A40**
Rating plate inscription (instead of German) • English • French • Spanish • Italian	 **B11** **B12** **B13** **B14**
Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 8402 Acceptance test certificate B to DIN 50 049/EN 10 204-3.1 B Factory certificate to DIN 50 049-2.2/ EN 10 204-2.2	**C11** **C12** **C14**
Setting of upper limit of output signal to 22.0 mA	**D05**
Acid gas version to NACE (only together with seal diaphragm made of Hastelloy and process screws made of stainless steel)	**D07**
IP 68 (not together with Han 7D/Han 8U plug, Pg 13.5 screwed gland)	**D12**
Use in zone 0 (basic unit EEx ia)	**E02**
Oxygen application (max. 2325 psi with oxygen measurement and inert filling liquid)	**E10**
Interchanging of process connection side	**H01**
Vent on side for gas measurements	**H02**
Process flange made of: • Hastelloy • Monel	 **K01** **K02**
Additional information	
Please add **"Z"** to Order No. and specify Order code(s) and plain text.	
Measuring range to be set, specify in plain text: **Y01: ... to ... psi, inches H_2O, feet H_2O, ...**	**Y01**
Measuring-point number/identification (max. 16 characters), specify in plain text: **Y15: .....**	**Y15**
Measuring-point text (max. 27 characters), specify in plain text: **Y16: .....**	**Y16**
Setting for digital display, specify in plain text: **Y21: psi, inches H_2O, feet H_2O, ...** (see "Additional information" on page 11 for pressure dimensions selectable for "Y21")	**Y21**

Only the settings for "Y01", "Y21" and "D05" can be made in the factory.

Example for ordering: see page 11

[1] Only together with process flange screws made of stainless steel.
[2] Version 7MF4333-1DY... only up to max. span 80" H_2O.
[3] Not for measuring cells 77 psi to 2325 psi.
[4] Without cable gland.
[5] Not together with type of protection "Explosion-proof".

Transmitters for differential pressure and flow

Ordering data
7MF4433

Ordering data

Order No.

SITRANS P transmitter for differential pressure and flow, two-wire system, DS III series, 464/2325 static

7MF4433- ■■■■■ - ■■■■

Meas. cell filling	Meas. cell cleaning	
Silicone oil	Normal	1
Inert liquid	Grease-free	3

Static 464, span

0.4"	to	8" H_2O [1])	B

Static 2325, span

0.4"	to	24" H_2O	C
1"	to	100" H_2O	D
2.4"	to	240" H_2O	E
6.4"	to	640" H_2O	F
20"	to	2000" H_2O	G
120"	to	12,000" H_2O	H

Wetted parts materials
(process flange made of stainless steel)

Process diaphragm	Parts of meas. cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Tantalum [2])	Tantalum	E
Monel [2])	Monel	H
Gold [2])[3])	Gold	L
Version for remote seal		Y

Process connection

Female thread $^1/_4$ - 18 NPT with flange connection to DIN 19 213

• Sealing screw opposite process conn.		
- Mounting thread	M10	0
- Mounting thread	$^7/_{16}$ - 20 UNF	2
• Sealing screw on side of process flanges		
- Mounting thread	M10	4
- Mounting thread	$^7/_{16}$ - 20 UNF	6

Non-wetted parts materials

Process flange screws	Electronics housing	
Steel	Die-cast aluminium	0
Stainless steel	Die-cast aluminium	2
Stainless steel	Stain. steel prec. cast.	3

Design

• Standard version	1
• International version (available soon), English label inscriptions, documentation in 5 languages on CD	2

Explosion protection

• Without explosion protection	A
• With explosion protection (CENELEC) Type of protection:	
- "Intrinsic safety" (EEx ia)	B
- "Explosion-proof" (EEx d) [4])	D
- "Intrinsic safety and explosion-proof" (EEx ia +EEx d) [4]) (planned)	P
• Use in zone 2 (planned)	E
• With explosion protection	
- FM intrinsically safe & explosion-proof	H C
- CSA intrinsically safe & explosion-proof	L C
- FM and CSA intrinsically safe and explosion-proof	N C

Electrical connection/cable inlet

• Screwed gland Pg 13.5 [5])	A
• Screwed gland M20 x 1.5	B
• Screwed gland $^1/_2$ - 14 NPT	C
• Han 7D plug [5])	D

Indicator

• Without indicator (hidden, setting: mA)	1
• With indicator (digital display visible, setting: mA)	6
• With indicator (digital display visible, setting as specified, Order code Y21 required)	7

Ordering data

Order code

Further designs

Please add **"Z"** to Order No. and specify Order code(s).

Transmitter with mounting bracket made of	
• Steel	**A01**
• Stainless steel	**A02**
Instead of FPM (Viton), process flange O-ring made of:	**A20**
• PTFE (Teflon)	**A21**
• FEP (with silicone core, approved for food)	**A22**
• FFPM (Kalrez)	**A23**
• NBR (Buna N)	
Han 7D plug (metal, gray)	**A30**
Han 8U plug (instead of Han 7D)	**A31**
Sealing screws ($^1/_4$ - 18 NPT) with valve in material of process flange	**A40**
Rating plate inscription (instead of German)	
• English	**B11**
• French	**B12**
• Spanish	**B13**
• Italian	**B14**
Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 8402	**C11**
Acceptance test certificate B to DIN 50 049/EN 10 204-3.1 B	**C12**
Factory cert. to DIN 50 049-2.2/EN 10 204-2.2	**C14**
Setting of upper limit of output signal to 22.0 mA	**D05**
Acid gas version to NACE (only together with seal diaphragm made of Hastelloy and process flange screws made of stainless steel)	**D07**
IP 68 (not together with Han 7D/Han 8U plug, Pg 13.5 screwed gland)	**D12**
Use in zone 0 (basic unit EEx ia)	**E02**
Over-filling safety device for flammable and non-flammable liquids (max. PN 32) (basic unit EEx ia)	**E08 (planned)**
Oxygen application (max. 2325 psi with oxygen measurement and inert filling liquid)	**E10**
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 or K02)	**H03**
Process flange made of Hastelloy	**K01**
Process flange made of Monel	**K02**

Additional information

Please add **"Z"** to Order No. and specify Order code(s) and plain text.

Measuring range to be set, specify in plain text:	
• With linear characteristic: **Y01: ... to ... psi, inches H_2O, feet H_2O, ...**	**Y01**
• With square-rooted characteristic: **Y02: ... to ... psi, inches H_2O, feet H_2O, ...**	**Y02**
Measuring-point number/identification (max. 16 characters), specify in plain text: **Y15: .....**	**Y15**
Measuring-point text (max. 27 characters), specify in plain text: **Y16: .....**	**Y16**
Setting for digital display, specify in plain text: **Y21: psi, inches H_2O, feet H_2O, ...** (see "Additional information" on page 11 for pressure dimensions selectable for "Y21")	**Y21**

Only the settings for "Y01", "Y02", "Y21" and "D05" can be made in the factory.

[1]) Not suitable for connection of remote seal.
[2]) Only together with max. spans 100", 640", 2000" and 12,000" H_2O.
[3]) Only together with process flange screws made of stainless steel.
[4]) Without cable gland.
[5]) Not together with type of protection "Explosion-proof".

Ordering data 7MF4533

Ordering data

Order No.

SITRANS P transmitter for differential pressure and flow, two-wire system, DS III series, 6090 psi static

7MF4533- 1 ■■■■ - ■■■■

Min. Span		Max. Span	
1"	to	100" H_2O	D
2.4"	to	240" H_2O	E
6.4"	to	640" H_2O	F
20"	to	2000" H_2O	G
4.35psi	to	435 psi	H

Wetted parts materials
(process flange made of stainless steel)

Process diaphragm	Parts of meas. cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Gold [1])	Gold	L

Process connection

Female thread $^1/_4$ - 18 NPT and flange connection to DIN 19213

- Sealing screw opposite process connection
  - Mounting thread M12 — 1
  - Mounting thread $^7/_{16}$ - 20 UNF — 3
- Sealing screw on side of process flanges
  - Mounting thread M12 — 5
  - Mounting thread $^7/_{16}$ - 20 UNF — 7

Non-wetted parts materials

Process flange screws	Electronics housing	
Steel	Die-cast aluminium	0
Stainless steel (≤ PN 315)	Die -cast aluminium	2
Stainless steel (≤ PN 315)	Stain. steel prec. cast.	3

Design

- Standard version — 1
- International version (available soon), English label inscriptions, documentation in 5 languages on CD — 2

Explosion protection

- Without explosion protection — A
- With explosion protection (CENELEC) Type of protection:
  - "Intrinsic safety" (EEx ia) — B
  - "Explosion-proof" (EEx d) [2]) — D
  - "Intrinsic safety and explosion-proof" (EEx ia +EEx d) [2]) (planned) — P
- Use in zone 2 (planned) — E
- With explosion protection
  - FM intrinsically safe & explosion-proof — H C
  - CSA intrinsically safe & explosion-proof — L C
  - FM and CSA intrinsically safe & explosion-proof — N C

Electrical connection/cable inlet

- Screwed gland Pg 13.5 [3]) — A
- Screwed gland M20 x 1.5 — B
- Screwed gland $^1/_2$ - 14 NPT — C
- Han 7D plug [3]) — D

Indicator

- Without indicator (digital display hidden, setting: mA) — 1
- With indicator (digital display visible, setting: mA) — 6
- With indicator (digital display visible, setting as specified, Order code Y21 required) — 7

Example for ordering: see page 11

) Only together with max. spans 100", 240", 2000" H2O, and 435 psi max. Static 4565 psi with stainless steel process flange screws .
[2]) Without cable gland.
[3]) Not together with type of protection "Explosion-proof".

Ordering data

Order code

Further designs

Please add **"Z"** to Order No. and specify Order code(s).

Transmitter with mounting bracket made of • Steel • Stainless steel	 **A01** **A02**
Instead of FPM (Viton), process flange O-ring made of: • PTFE (Teflon) • FEP (with silicone core, approved for food) • FFPM (Kalrez) • NBR (Buna N)	 **A20** **A21** **A22** **A23**
Han 7D plug (metal, gray)	**A30**
Han 8U plug (instead of Han 7D)	**A31**
Sealing screw ($^1/_4$ - 18 NPT) with valve in material of process flange	**A40**
Rating plate inscription (instead of German) • English • French • Spanish • Italian	 **B11** **B12** **B13** **B14**
Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 8402 Acceptance test certificate B to DIN 50 049/EN 10 204-3.1 B Factory cert. to DIN 50 049-2.2/EN 10 204-2.2	**C11** **C12** **C14**
Setting of upper limit of output signal to 22.0 mA	**D05**
Acid gas version to NACE (only together with seal diaphragm made of Hastelloy and process flange screws made of stainless steel) (max. PN 315)	**D07**
Process flange screws made of stainless steel for PN 420, basic unit with process flange screws made of stainless steel	**D09**
IP 68 (not together with Han 7D/Han 8U plug, Pg 13.5 screwed gland)	**D12**
Use in zone 0 (basic unit EEx ia)	**E02**
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 or K02)	**H03**

Additional information

Please add **"Z"** to Order No. and specify Order code(s) and plain text.

Measuring range to be set, specify in plain text: • With linear characteristic: **Y01: ... to ... psi, inches H_2O, feet H_2O, ...**	 **Y01**
• With square-rooted characteristic: **Y02: ... to ... psi, inches H_2O, feet H_2O, ...**	**Y02**
Measuring-point number/identification (max. 16 characters), specify in plain text: **Y15: .....**	**Y15**
Measuring-point text (max. 27 characters), specify in plain text: **Y16: .....**	**Y16**
Setting for digital display, specify in plain text: **Y21: psi, inches H_2O, feet H_2O, ...** (see "Additional information" on page 11 for pressure dimensions selectable for "Y21")	**Y21**

Only the settings for "Y01" or "Y02", "Y21" or "D05" can be made in the factory.

Ordering data
7MF4633

Ordering data — Order No.

SITRANS P transmitter for level, two-wire system, DS III series

Span

10"	to	100" H_2O
10"	to	240" H_2O
20"	to	640" H_2O
64"	to	2000" H_2O

Process connection of low-pressure side

Female thread $^1/_4$ - 18 NPT and flange connection to DIN 19213 with mounting thread

- M10
- $^7/_{16}$ - 20 UNF

Non-wetted parts materials

Process flange screws	Electronics housing
Steel	Die-cast aluminium
Stainless steel	Die-cast aluminium
Stainless steel	Stain. steel prec. cast.

Design

- Standard version
- International version (available soon), English label inscriptions, documentation in 5 languages on CD

Explosion protection

- Without explosion protection
- With explosion protection (CENELEC) Type of protection:
  - "Intrinsic safety" (EEx ia)
  - "Explosion-proof" (EEx d) [1])
  - "Intrinsic safety and explosion-proof" (EEx ia +EEx d) [1]) (planned)
- Use in zone 2 (planned)

Electrical connection/cable inlet

- Screwed gland Pg 13.5 [2])
- Screwed gland M20 x 1.5
- Screwed gland $^1/_2$ - 14 NPT
- Han 7D plug [2])

Indicator

- Without indicator (digital display hidden, setting: mA)
- With indicator (digital display visible, setting: mA)
- With indicator (digital display visible, setting as specified, Order code Y21 required)

7MF4633-

1	Y			-					
D									
E									
F									
G									
		0							
		2							
			0						
			2						
			3						
				1					
				2					
					A				
					B				
					D				
					P				
					E				
						A			
						B			
						C			
						D			
							1		
							6		
							7		

Ordering note: 1st order item: Transmitter 7MF4633-...
2nd order item: Mounting flange 7MF4912-3...

Example for ordering:

Item line 1:	7MF4633-1EY20-1AA1-Z
B line:	Y01
C line:	Y01: 32" to 160" H_2O
Item line 2:	7MF4912-3GE01

Ordering data — Order code

Further designs

Please add **"Z"** to Order No. and specify Order code(s).

Instead of FPM (Viton), process flange O-ring made of:	
• PTFE (Teflon)	**A20**
• FEP (with silicone core, approved for food)	**A21**
• FFPM (Kalrez)	**A22**
• NBR (Buna N)	**A23**
Han 7D plug (metal, gray)	**A30**
Han 8U plug (instead of Han 7D)	**A31**
Sealing screws ($^1/_4$ - 18 NPT) with valve in material of process flange	**A40**
Rating plate inscription (instead of German)	
• English	**B11**
• French	**B12**
• Spanish	**B13**
• Italian	**B14**
Manufacturer's test certificate M to DIN 55 350, Part 18 and to ISO 8402	**C11**
Acceptance test certificate B to DIN 50 049/EN 10 204-3.1 B	**C12**
Factory cert. to DIN 50 049-2.2/EN 10 204-2.2	**C14**
Setting of upper limit of output signal to 22.0 mA	**D05**
IP 68 (not together with Han 7D/Han 8U plug, Pg 13.5 screwed gland)	**D12**
Use in zone 0 (basic unit EEx ia)	**E02**
Over-filling safety device for flammable and non-flammable liquids (max. PN 32) (basic unit EEx ia)	**E08 (planned)**
Interchanging of process connection side	**H01**

Additional information

Please add **"Z"** to Order No. and specify Order code(s) and plain text.

Measuring range to be set, specify in plain text:	
Y01: ... to ... psi, inches H_2O, feet H_2O, ...	**Y01**
Measuring-point number/identification (max. 16 characters), specify in plain text:	
Y15:	**Y15**
Measuring-point text (max. 27 characters), specify in plain text:	
Y16:	**Y16**
Setting for digital display, specify in plain text:	
Y21: psi, inches H_2O, feet H_2O, ...	**Y21**
(see "Additional information" on page 11 for pressure dimensions selectable for "Y21")	

Only the settings for "Y01", "Y21" and "D05" can be made in the factory.

[1]) Without cable gland.
[2]) Not together with type of protection "Explosion-proof".

Ordering data
Mounting flange 7MF4912

Ordering data

Order No. Order code

Mounting flange
Directly fitted onto SITRANS P transmitter for level, for

DS III series

Flange	Nom. diam.	Nom. press.	Order code
Connection to DIN 2501	DN 80	PN 40	D
	DN 100	PN 16 PN 40	G H
Connection to ANSI B16.5	3 inch	class 150 class 300	Q R
	4 inch	class 150 class 300	T U
Other version Add Order code and plain text: Nominal diameter: ...; Nom. pressure: ...			Z J1Y

7MF4912- ■■■■■ ■■■

3

Wetted parts materials

	Order code
• Stainless steel, mat. No. 1.4571	A
- Coated with PFA [1]	D
- Coated with PTFE [1]	E
- Coated with ECTFE [1]	F
• Monel 400, mat. No. 2.4360	G
• Hastelloy B2, mat. No. 2.4617	H
• Hastelloy C276, mat. No. 2.4819	J
• Hastelloy C4, mat. No. 2.4610	U
• Tantalum	K
Other version Add Order code and plain text: Wetted parts materials: ...	Z K1Y

Sealing face: see "Technical data"

Extension length

	Order code
• Without tube	0
• 50 mm	1
• 100 mm	2
• 150 mm	3
• 200 mm	4

Filling liquid

	Order code
• Silicone oil M5	1
• Silicone oil M50	2
• High-temperature oil	3
• Halocarbon oil (for O_2 measurements)	4
• Vegetable oil	5
• Glycerine/water [2]	6
Other version Add Order code and plain text: Filling liquid:	9 M1Y

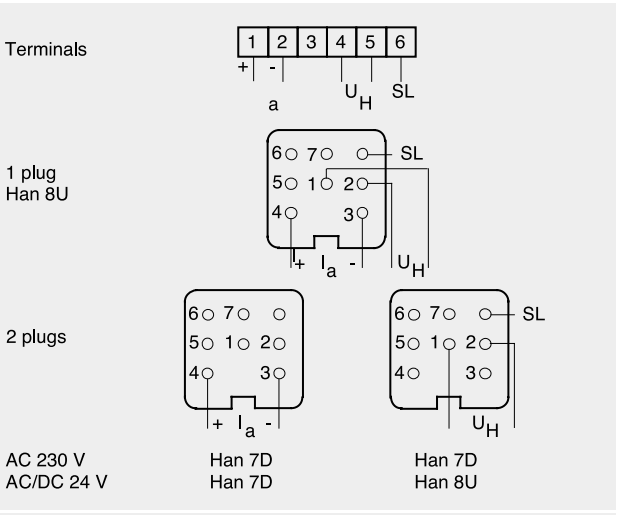
	Order code
Further designs Please add **"Z"** to Order No. and specify Order code(s).	
With flame flashover lock-out for mounting on zone 0 (including documentation)	**A01**
Manufacturer's test certificate M to DIN 55 350, Part 18, and to ISO 8402	**C11**
Acceptance test certificate B to DIN 50 049, Section 3.1/EN 10 204	**C12**
Vacuum-resistant design (for use in vacuum range)	**V04**
Calculation of span of associated transmitter (enclose filled-in questionnaire with order) **Note:** Suffix "Y01" required with transmitter!	**Y05**

Example for ordering: see page 16.

Supplementary electronics for four-wire connection

Description

By direct connection of the supplementary electronics to a SITRANS P transmitter, a transmitter for four-wire connection is produced. The supplementary electronics can be connected to all DS III series transmitters, with the exception of the explosion-proof designs. The supplementary electronics is fitted in a light metal housing which is mounted on the left side of the transmitter.



I_a Output current
SL Protective earth conductor
U_H Power supply

Fig. 11 Connection diagram

Ordering data

Order No. of transmitter

Order code[3]

7MF4■33 - ■■■■■ - 1AA■

V■■

Supplementary electronics for four-wire connection

Power supply	Electrical connection	Order code
UC 24 V	Terminals; 2 Pg screwed glands to the left	1
	2 Han 7D/Han 8U plugs to the left	3
	Terminals; 1 Pg screwed gland downwards	6
	1 Han 8U plug downwards[4]	9
AC 230 V	Terminals; 2 Pg screwed glands to the left	7
	2 Han 7D plugs to the left	8
Output current	0 to 20 mA	0
	4 to 20 mA	1 1

Accessories four-wire connection	Order No.
Instruction Manual (German)	**E86060-A6017-A131-A3**

[1] For vacuum on request.
[2] Not suitable for use in low-pressure range.
[3] Please add **"Z"** and specify Order code.
[4] Observe arrangement of plugs and differential pressure lines.

Transmitters for pressure, absolute pressure, differential pressure, flow and level

Accessories

Ordering data	Order No.
Spare parts	
Mounting bracket and mounting parts for pressure transmitters: MK II, MS, DS and DS III series (7MF4010/4013/4032/4033-■■■■■-1■C ■) For absolute pressure transmitters: DS and DS III series (7MF4232/4233-■■■■■-1■C ■)	
• Made of steel	**7MF4997-1AB**
• Made of stainless steel	**7MF4997-1AH**
Mounting bracket and mounting parts for pressure transmitters: MK II, MS, DS and DS III series (7MF4010/4013/4032/4033-■■■■■-1■A ■, -1■B ■ and -1■D ■), For absolute pressure transmitters: DS and DS III series (7MF4232/4233-■■■■■-1■A, ■-1■B ■ and -1■D ■),	
• Made of steel	**7MF4997-1AC**
• Made of stainless steel	**7MF4997-1AJ**
Mounting bracket and mounting parts for differential pressure transmitters with M10 flange thread (7MF43-■■-... and 7MF44-■■-...)	
• Made of steel	**7MF4997-1AD**
• Made of stainless steel	**7MF4997-1AK**
Mounting bracket and mounting parts for differential pressure transmitters with M12 flange thread (7MF45-■■-...)	
• Made of steel	**7MF4997-1AE**
• Made of stainless steel	**7MF4997-1AL**
Mounting bracket and mounting parts for differential pressure and absolute pressure transmitters with flange thread $^{7}/_{16}$- 20 UNF (7MF43-■■-..., 7MF44-■■-... and 7MF45-■■-...)	
• Made of steel	**7MF4997-1AF**
• Made of stainless steel	**7MF4997-1AM**
Cover (die-cast aluminium) without window, including gasket for MK II, MS, DS and DS III series	**7MF4997-1BB**
Cover (stainless steel) without window, including gasket, for DS and DS III series	**7MF4997-1BC**
Cover (die-cast aluminium) with window, including gasket, for MK II, MS, DS and DS III series	**7MF4997-1BE**
Cover (stainless steel) with window, including gasket, for DS and DS III series	**7MF4997-1BF**
Digital display including mounting material for MS and DS III series	**7MF4997-1BR**
Measuring-point label	
• Without inscription (5 off)	**7MF4997-1CA**
• Printed (1 off), data according to Y01 or Y02, Y15 and Y16 (see Ordering data for SITRANS P transmitters)	**7MF4997-1CB-Z Y■■: .....**
Mounting screws for measuring-point label for DS and DS III series, earthing and connection terminals or for digital display (50 off)	**7MF4997-1CD**
Sealing screws (1 set = 2 off) for process flange	
• Stainless steel	**7MF4997-1CG**
• Hastelloy	**7MF4997-1CH**

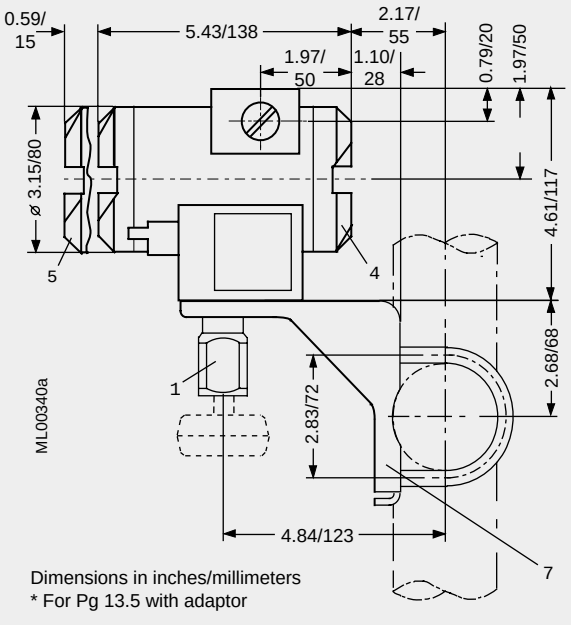
Available ex stock

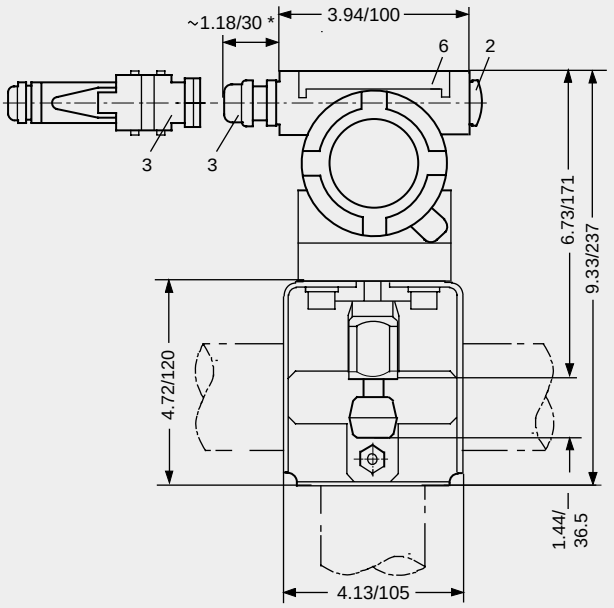
Ordering data	Order No.
Spare parts (continued)	
Vent valves complete (1 set = 2 off)	
• Stainless steel	**7MF4997-1CP**
• Hastelloy	**7MF4997-1CQ**
Process flange O-ring made of:	
• FPM (Viton)	**7MF4997-2DA**
• PTFE (Teflon)	**7MF4997-2DB**
• FEP (with silicone core, approved for food)	**7MF4997-2DC**
• FFPM (Kalrez)	**7MF4997-2DD**
• NBR (Buna N)	**7MF4997-2DE**
Instruction Manuals	
Instruction manual for SITRANS P, DS III series	
• German	**A5E00047090**
• English	**A5E00047092**
• French	**A5E00053218**
• Spanish	**A5E00053220**
• Italian	**A5E00053219**
Brief instructions (Leporello) for DS III (German/English)	**A5E00047093**
HART communication	
HART communicator, with accu, charger unit for AC 230 V and carrying case, type of protection "Intrinsic safety" EEx ia IIC T4	
• German	**7MF4998-8KF**
• English	**7MF4998-8KT**
HART modem	**7MF4997-1DA**

Ordering data	Order No.
SITRANS I isolating power supply HART (FSK) Rail-mounted to supply two-wire transmitters, output 4 to 20 mA, intrinsically-safe input 4 to 20 mA with EEx ia/ib IIB/IIC	**7NG4122 - 1 ■ A10**
Power supply	
• 24 V AC/DC (22.5 mm wide)	**A**
• 95 to 253 V AC (35 mm wide)	**B**

Ordering data	Order No.
SIMATIC PDM V5.0.1 for operation and parameterization of process devices, including communication via HART modem	**7MP5 000-0AA00-0AA0**
Options for SIMATIC PDM V5.0.1	**7MP4 000-■X ■■0 - ■■■0**
- Not integrated in STEP 7	**0**
- Integrated in STEP 7	**1**
- Without routing	**A**
- With routing via S7-400 [1])	**B**
- 16 tags from basic version	**0**
- Up to 128 tags	**1**
- Up to 512 tags	**2**
- Unlimited number of tags	**3**
- Without communication	**0**
- With communication via PROFIBUS-DP and -PA	**1**
- Without communication	**A**
- With communication via HART modules in ET 200M	**B**
- Without communication	**A**
- With communication via standard HART multiplexer	**B**

[1]) Only together with option "With integration in STEP 7".





[1]) Plus approx. 20 mm thread length to permit unscrewing.

1 Process connection $^1/_2$ – 14 NPT, connection shank G$^1/_2$ A or oval flange
2 Blanking plug
3 Electrical connection:
Screwed gland Pg 13.5 (adapter)
Screwed gland M20 x 1.5 or
Screwed gland $^1/_2$ - 14 NPT or
Han 7D/Han 8 U plug

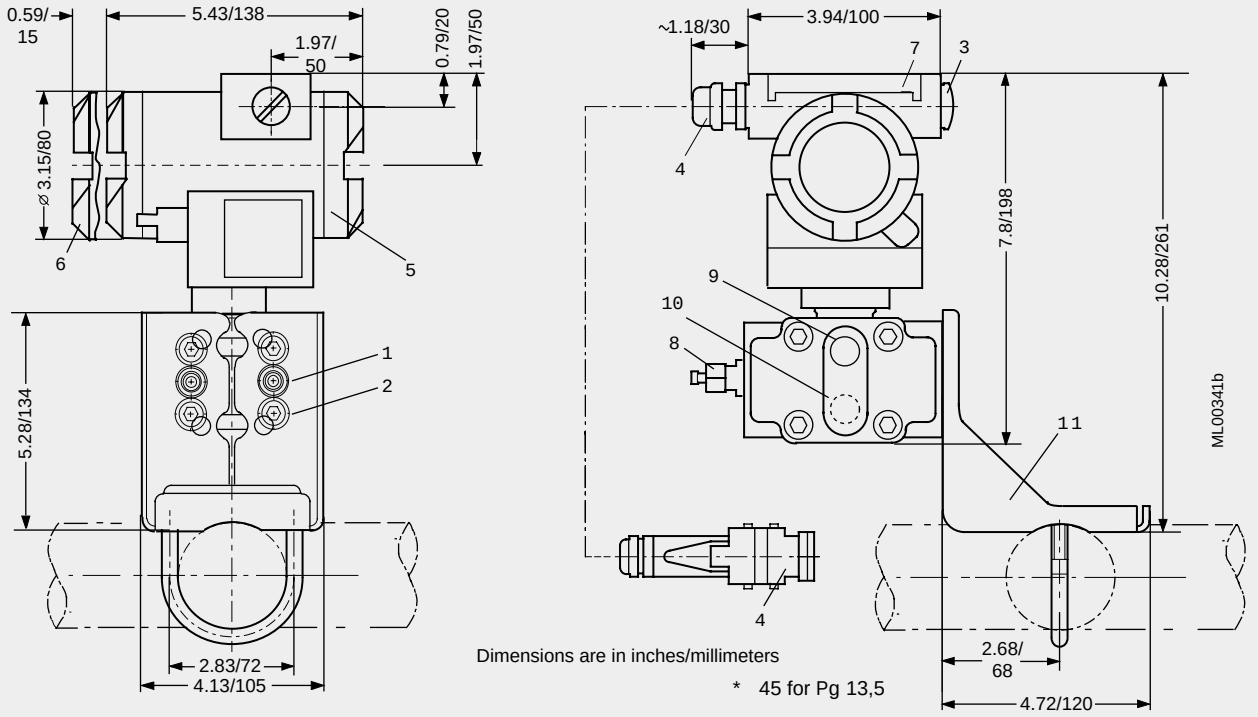
* 45 for Pg 13,5

4 Connector side
5 Electronics side, digital display (greater length for cover with window)
6 Protective cover over keys
7 Mounting bracket (option)

This Figure is for Models 7MF4033 and 7MF4233.

Fig. 12 Dimensions, Gauge Construction, Pressure and Absolute Models

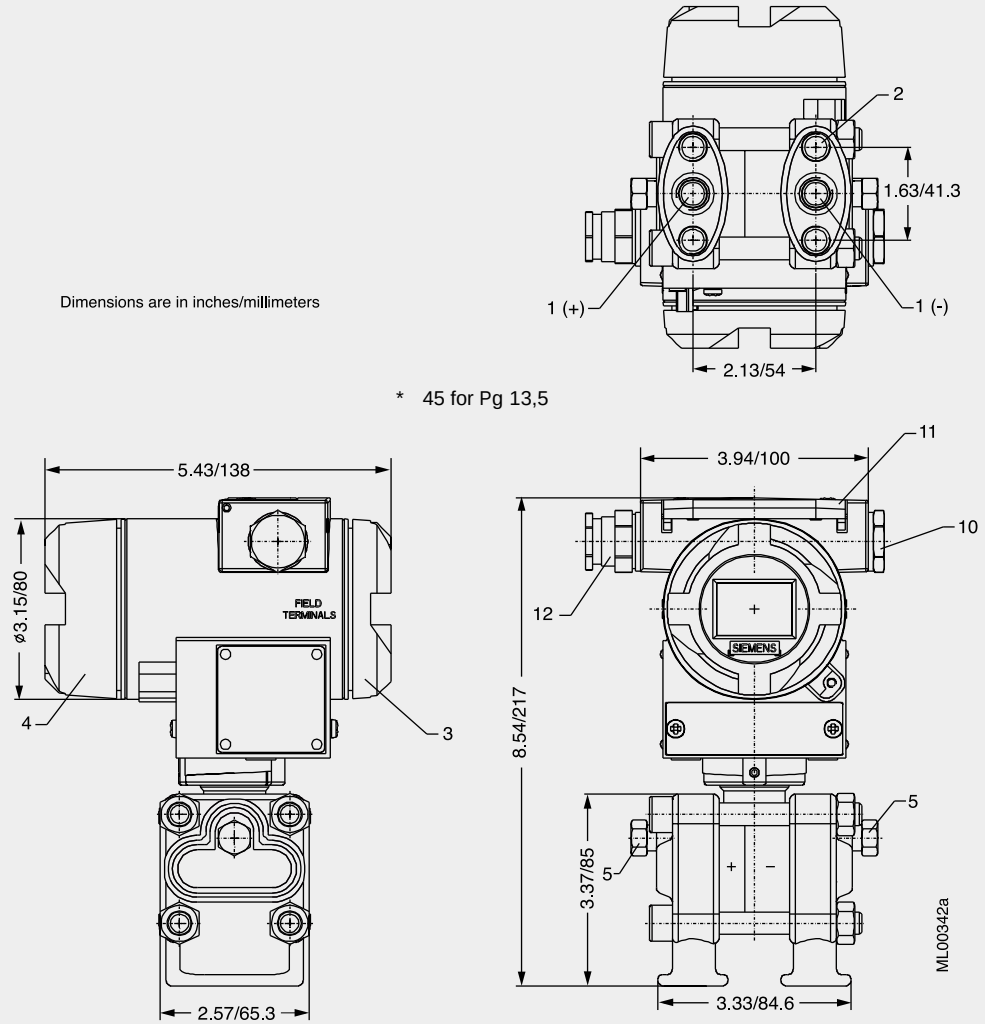
Dimensional drawings



1 Process connection of low-pressure side $^{1}/_{4}$ –18 NPT for absolute pressure (+) side
2 Mounting thread M10, M12 or $^{7}/_{16}$ – 20 UNF
3 Dummy plug
4 Electrical connection:
Screwed gland Pg 13.5 (adapter)
M20 x 1.5 or $^{1}/_{2}$ –14 NPT or
Han 7D/Han 8U plug
5 Connection side
6 Electronics side, digital display (greater length for cover with window)
7 Protective cover over keys
8 Sealing screw
9 Side vent for measuring liquid
10 Side vent for measuring gas (supplement H02)
11 Mounting bracket (option)

This Figure is for Models 7MF4333, 7MF4433, and 7MF4533.

Fig. 13 Dimensions, Differential Construction, Diff., Flow and Absolute Models



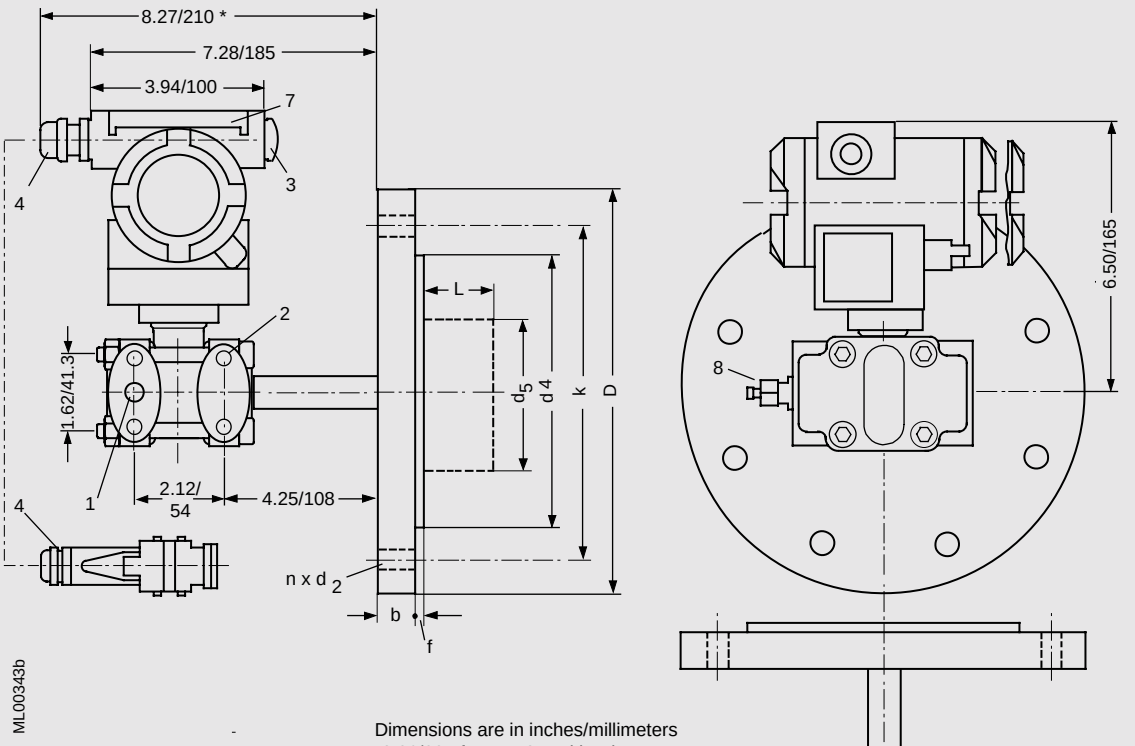
1 Process connection of low-pressure side $^{1}/_{4}$ –18 NPT
2 Mounting thread M10, M12 or $^{7}/_{16}$ – 20 UNF
3 Connection side
4 Electronics side, digital display
5 Sealing screw
6 Blanking plug (only for PG 13.5 and Han 7D)
Protective cover over keyboard
7 Electrical connection:
Cable gland Pg 13.5[1.2]
M20 x 1.5[2] or $^{1}/_{2}$ –14 NPT or
Han 7D plug[1.2]

1–not for explosion proof degree of protection
2–not in FM exp/CSA degree of protection

This Figure is for Models 7MF4433 and 7MF4533 with HO3 option.

Fig. 14 Dimensions, Differential Pressure and Flow Models with HO3 Option

Dimensional drawings



Dimensions are in inches/millimeters
*8.86/225 for Pg 13.5 with adapter

* 225 for Pg 13,5

1 Process connection of low-pressure side $^1/_4$ –18 NPT
2 Mounting thread M10, M12 or $^7/_{16}$ – 20 UNF
3 Blanking plug
4 Electrical connection:
Cable gland Pg 13.5 (with adapter)
M20 x 1.5 or $^1/_2$ –14 NPT or Han 7D/Han 8U plug
5 Connection side
6 Electronics side, digital display (greater length for cover with window)
7 Protective cover over keys
8 Sealing screw with valve

This Figure is for Models 7MF4633 and 7MF4912.

Fig. 15 Dimensions, Flagged Level Models

Connection to DIN 2501

Nom. diam.	Nom. press.	b	D	d	d_2	d_4	d_5	d_M	f	k	n	L
DN 80	PN 40	24	200	90	18	138	76	72 [1])	3	160	8	
DN 100	PN 16	20	220	115	18	158	94	89	3	180	8	0, 50, 100, 150, or 200
	PN 40	24	235	115	22	162	94	89	3	190	8	

Connection to ANSI B16.5

Nom. diam.	Nom. press. lb/sq.in.	b inch (mm)	D inch (mm)	d_2 inch (mm)	d_4 inch (mm)	d_5 inch (mm)	d_M inch (mm)	f inch (mm)	k inch (mm)	n inch (mm)	L inch (mm)
3 inch	150	0.94 (23.8)	7.5 (190.5)	0.75 (19.0)	5 (127)	3 (75.5)	2.81 [1]) (72)	0.06 (1.6)	6 (152.4)	4	
	300	1.12 (28.6)	8.25 (209.5)	0.87 (22.2)	5 (127)	3 (75.5)	2.81 [1]) (72)	0.06 (1.6)	6.69 (168.3)	8	0, 2, 3.94, 5.94 or 7.87
4 inch	150	0.94 (23.8)	9 (228.5)	0.75 (19.0)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.06 (1.6)	7.5 (190.5)	8	(0, 50, 100, 150 or 200)
	300	1.25 (31.7)	10 (254)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.06 (1.6)	7.88 (200)	8	

d Internal diameter of gasket to DIN 2690
d_M Effective diaphragm diameter
[1]) 89 mm = $3^1/_2$ inch with tube length L = 0.

SIEMENS

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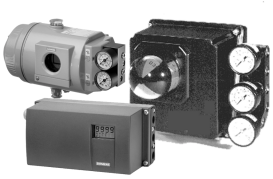

Actuators/Final Control Elements

- Valve positioners: Digital, Electro-pneumatic, pneumatic
- Pressure regulators
- Relays: Flow control, Flow selection, Constant volume, Volume boosting

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ADPDS3-1 Rev. 2, March 2001
5M INP