

SITRANS P measuring instruments for pressure

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

DS III, DS III PA and DS III FF series
Technical description

Overview



SITRANS P pressure transmitters, DS III series, are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameterization is performed using control keys, over HART communication, PROFIBUS-PA or FOUNDATION Fieldbus interface.

Extensive functionality enables the pressure transmitter to be precisely adapted to the plant's requirements. Operation is very simple in spite of the numerous setting options.

Transmitters with type of protection "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

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

Various versions of the DS III pressure transmitters are available for measuring:

- Gage pressure
- Absolute pressure
- For differential pressure transmitters
- Filling level
- Mass level
- Volume level
- Volume flow
- Mass flow

Benefits

- High quality and long life
- High reliability even under extreme chemical and mechanical loads
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions
- Separate replacement of measuring cell and electronics without recalibration
- Minimum conformity error
- Small long-term drift
- Wetted parts made of high-grade materials (e.g. stainless steel, Hastelloy, gold, Monel, tantalum)

- Infinitely adjustable span from 0.01 mbar to 400 mbar for DS III with HART communication
- Nominal measuring range from 1 to 400 bar for DS III PA (PROFIBUS PA) and FF (FOUNDATION Fieldbus)
- High measuring accuracy
- Parameterization over control keys and HART communication, PROFIBUS PA communication or FOUNDATION Fieldbus interface.

Application

The pressure transmitters of the DS III series, can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes the DS III pressure transmitters suitable for locations with high electromagnetic emissions.

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

Pressure transmitters with the type of protection "Intrinsic safety" for use in zone 0 may be operated with power supply units of category "ia" and "ib".

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

The pressure transmitter can be operated locally over 3 control keys or programmed externally over HART communication or over PROFIBUS PA or FOUNDATION Fieldbus interface.

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Pressure transmitter for gage pressure

- Measured variable: Gage pressure of aggressive and non-aggressive gases, vapors and liquids.
- Span (infinitely adjustable)
for DS III HART: 0.01 ... 400 bar g (0.145 ... 5802 psi g)
- Nominal measuring range
for DS III PA and FF: 1 ... 400 bar g (14.5 ... 5802 psi g)

Pressure transmitters for absolute pressure

- Measured variable: Absolute pressure of aggressive and non-aggressive gases, vapors and liquids.
- Span (infinitely adjustable)
for DS III HART: 8.3 mbar a ... 100 bar a (0.12 ... 1450 psi a)
- Nominal measuring range
for DS III PA and FF: 250 mbar a ... 100 bar a (3.63 ... 1450 psi a)
- There are two series:
 - Gage pressure series
 - Differential pressure series

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 DS III HART: 1 mbar ... 30 bar (0.0145 ... 435 psi)
- Nominal measuring range
for DS III PA and FF: 20 mbar ... 30 bar (0.29 ... 435 psi)

Pressure transmitters for level

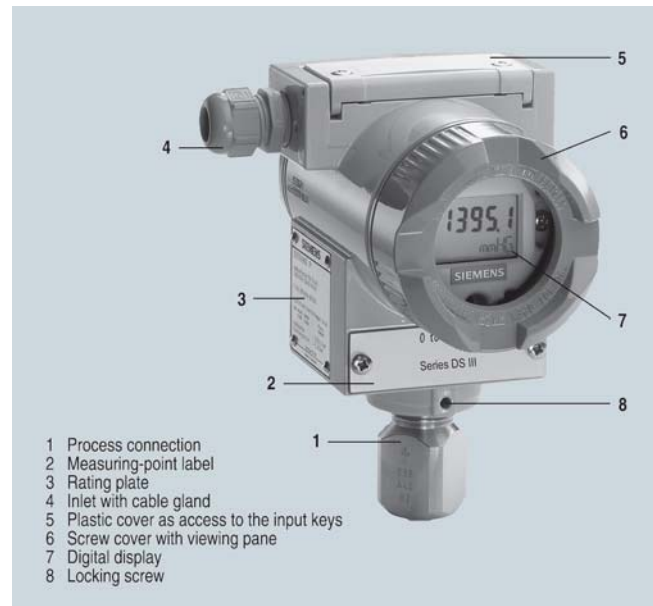
- Measured variable: Level of aggressive and non-aggressive liquids in open and closed vessels.
- Span (infinitely adjustable)
for DS III HART: 25 mbar ... 5 bar (0.363 ... 72.5 psi)
- Nominal measuring range
for DS III PA and FF: 250 mbar ... 5 bar (3.63 ... 72.5 psi)
- Nominal diameter of the mounting flange
 - DN 80 or DN 100
 - 3 inch or 4 inch

In the case of level measurements in open containers, the low-pressure connection of the measuring cell remains open (measurement "compared to atmospheric").

In the case of measurements in closed containers, the lower-pressure connection has to be connected to the container in order to compensate the static pressure.

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

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 (3, Figure "Front view") 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 of the housing. 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) 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 (1). The measuring cell is prevented from rotating by a locking screw (8). 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 (5), which hides the input keys.

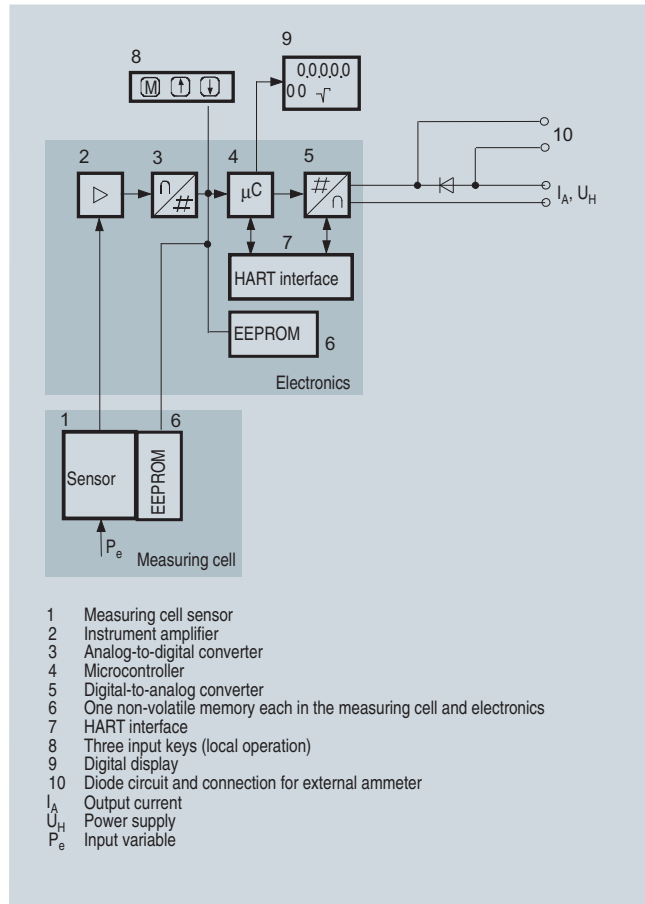
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Function

Operation of the electronics with PROFIBUS PA communication



Function diagram of the electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the instrument 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.

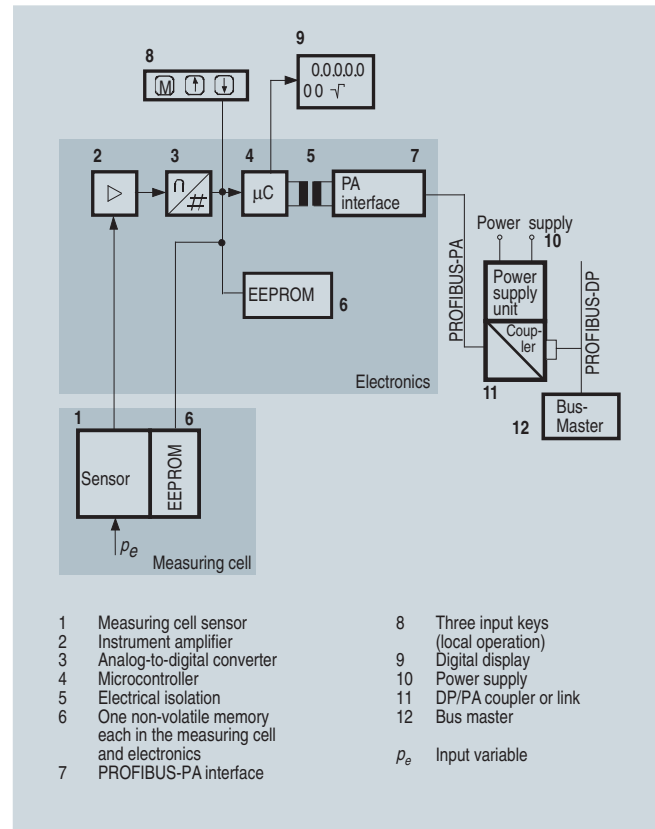
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

Using the 3 input keys (8) you can parameterize the pressure transmitter directly at the point of measurement. The input keys can also be used to control the view of the results, the error messages and the operating modes on the digital 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 the electronics with PROFIBUS PA communication



Function diagram of the electronics

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

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The first memory is linked with the measuring cell, the second with the electronics. This modular design means that the electronics and the measuring cell can be replaced separately from one another.

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

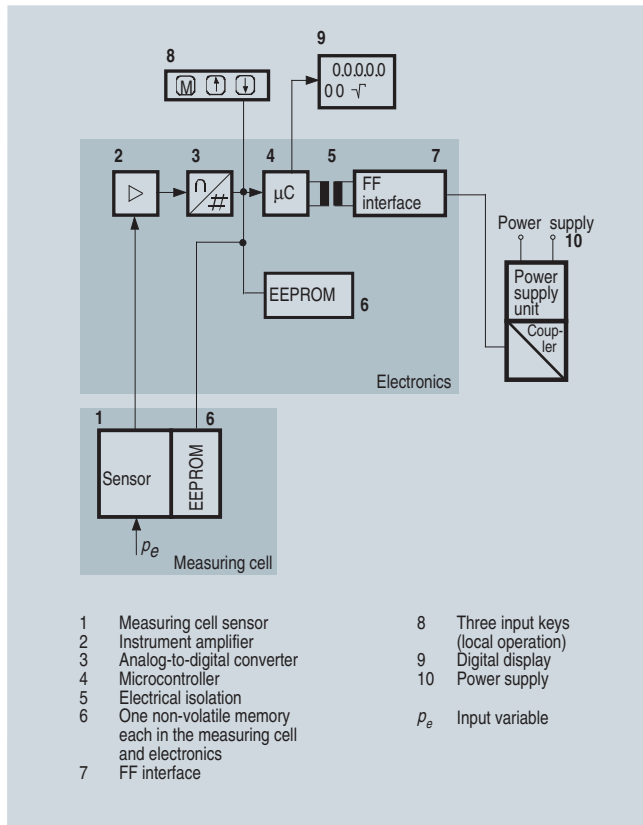
The results with status values and diagnostic values are transferred by cyclic data transmission on the PROFIBUS PA. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as SIMATIC PDM is required for this.

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Mode of operation of the FOUNDATION Fieldbus electronics



Function diagram of the electronics

The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the instrument 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).

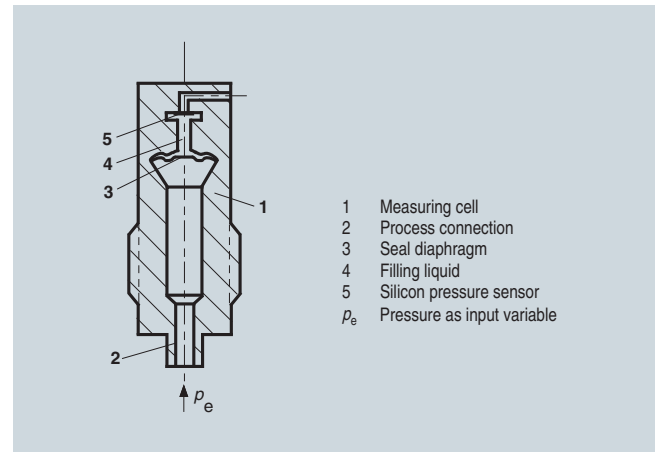
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

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

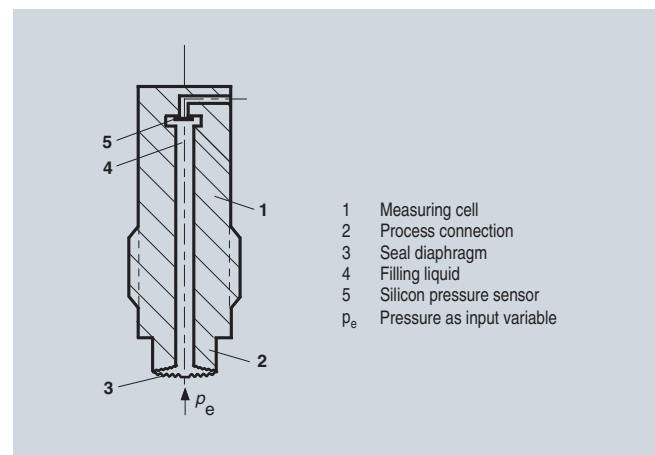
Measuring cell for gage pressure



Measuring cell for gage pressure, function diagram

The pressure p_e is applied through the process connection (2, Figure "Measuring cell for gage 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 input pressure.

Measuring cell for gage pressure, with front-flush diaphragm for paper industry



Measuring cell for gage pressure, with front-flush diaphragm for paper industry, function diagram

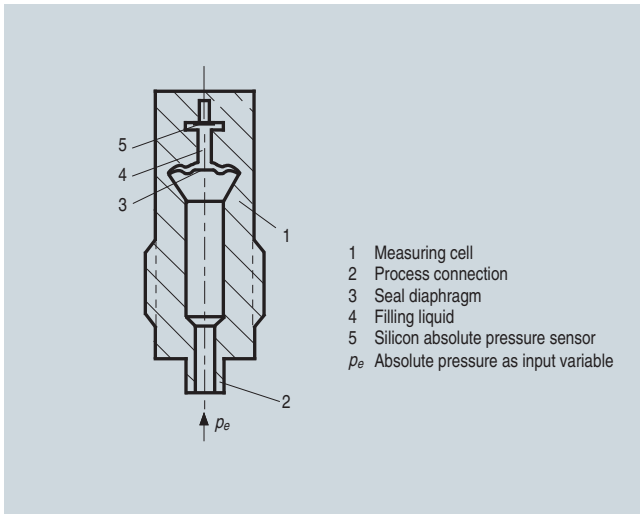
The pressure p_e is applied through the process connection (2, Figure "Measuring cell for gage pressure, with front-flush diaphragm for paper industry, function diagram") to the measuring cell (1). This pressure is subsequently transmitted further through the seal diaphragm (3) and the filling liquid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

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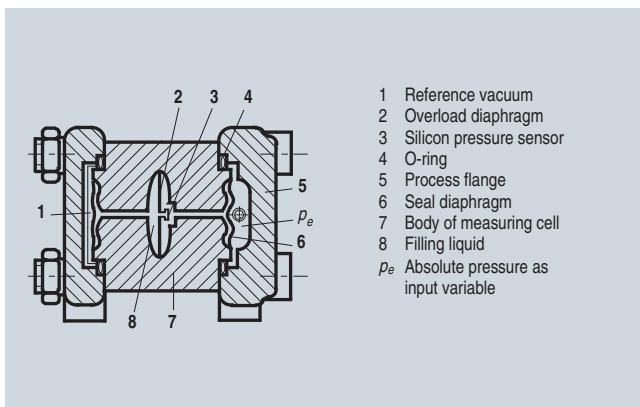
Measuring cell for absolute pressure from gage pressure series



Measuring cell for absolute pressure from the pressure series, function diagram

The absolute pressure p_e is transmitted through the seal diaphragm (3, Figure "Measuring cell for absolute pressure from the gage pressure series, function diagram") and the filling liquid (4) to the silicon absolute 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 input pressure.

Measuring cell for absolute pressure from differential pressure series



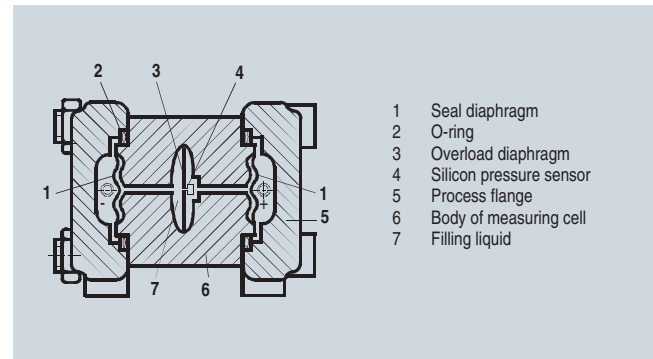
Measuring cell for absolute pressure from differential pressure series, function diagram

The input pressure p_e is transmitted through the seal diaphragm (6, Figure "Measuring cell for absolute pressure from differential pressure series, function diagram") and the filling liquid (8) to the silicon pressure sensor (3).

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 the 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.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (2) is flexed until the seal diaphragm rests on the body of the measuring cell (7), thus protecting the silicon pressure sensor from overloads.

Measuring cell for differential pressure and flow



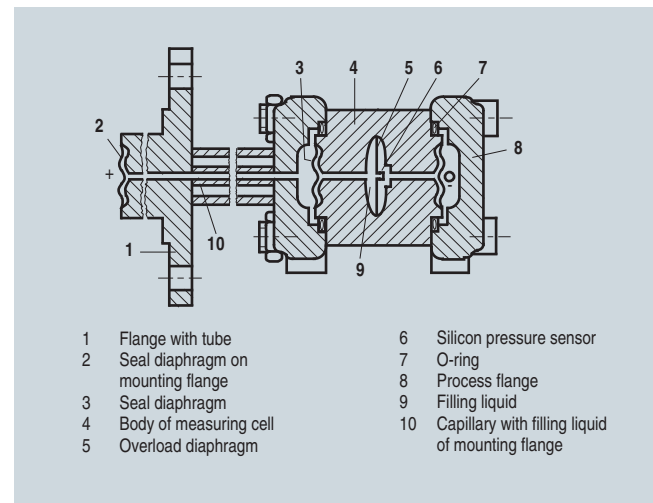
Measuring cell for differential pressure and flow, function diagram

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 absolute pressure.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (2) is flexed until the seal diaphragm rests on the body of the measuring cell (7), thus protecting the silicon pressure sensor from overloads.

Measuring cell for level



Measuring cell for level, function diagram

The input pressure (hydrostatic pressure) acts hydraulically on the measuring cell through the seal diaphragm on the mounting flange (2, Figure "Measuring cell for level, function diagram").

This differential pressure is subsequently transmitted further through the measuring cell (3) and the filling liquid (9) to the silicon pressure sensor (6) 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.

An overload diaphragm is installed to provide protection from overloads. If the measuring limits are exceeded, the overload diaphragm (2) is flexed until the seal diaphragm rests on the body

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of the measuring cell (7), thus protecting the silicon pressure sensor from overloads.

Parameterization DS III

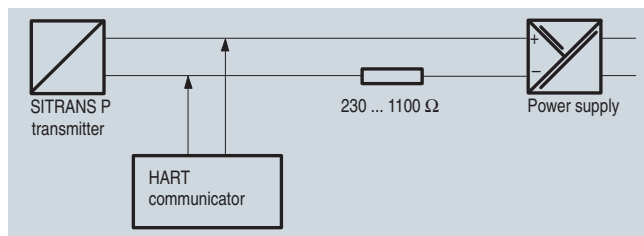
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input keys (local operation)

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

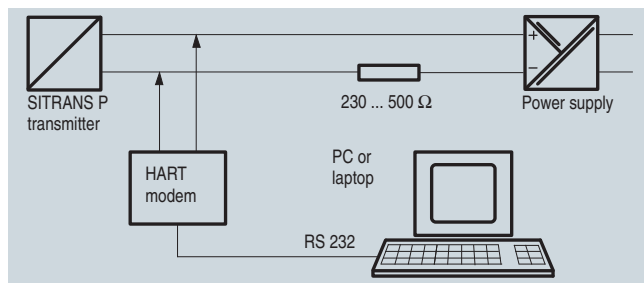
Parameterization using HART communication

Parameterization using HART communication is performed with a HART communicator or a PC.



Communication between a HART communicator and a pressure transm.

When parameterizing with the HART communicator, the connection is made directly to the 2-wire system.



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, DS III 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 keys, 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
Diagnostics functions		x

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

Diagnostic functions for DS III HART

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

Available physical units of display for DS III HART

Table style: Technical specifications 2

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm 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. The PROFIBUS puts the DS III PA in connection with 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 FF is connected to a process control system. Communication is possible even in a potentially explosive environment.

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

Adjustable parameters for DS III PA and FF

Parameters	Input keys (DS III HART)	PROFIBUS PA and FOUNDATION Fieldbus interface
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Key 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

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Diagnostic functions for DS III PA and FF

- 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 ₂ O, mmHg (4 °C), inH ₂ O, inHg (4 °C), ftH ₂ O (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	%

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SITRANS P, DS III series for gage pressure

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Input		
Measured variable	Gage pressure	
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span 0.01 ... 1 bar g (0.145 ... 14.5 psi g) 0.04 ... 4 bar g (0.58 ... 58 psi g) 0.16 ... 16 bar g (2.23 ... 232 psi g) 0.6 ... 63 bar g (9.14 ... 914 psi g) 1.6 ... 160 bar g (23.2 ... 2320 psi g) 4.0 ... 400 bar g (58 ... 5802 psi g) 7.0 ... 700 bar g (102 ... 10153 psi g)	Max. perm. test pressure 6 bar g (87 psi g) 10 bar g (145 psi g) 32 bar g (464 psi g) 100 bar g (1450 psi g) 250 bar g (3626 psi g) 600 bar g (8700 psi g) 800 bar g (11603 psi g)
		Nominal measuring range 1 bar g (14.5 psi g) 4 bar g (58 psi g) 16 bar g (232 psi g) 63 bar g (914 psi g) 160 bar g (2320 psi g) 400 bar g (5802 psi g) 700 bar g (10153 psi g)
		Max. perm. test pressure 6 bar g (87 psi g) 10 bar g (145 psi g) 32 bar g (464 psi g) 100 bar g (1450 psi g) 250 bar g (3626 psi g) 600 bar g (8700 psi g) 800 bar g (11603 psi g)
Lower measuring limit	30 mbar a (0.435 psi a)	
<ul style="list-style-type: none"> Measuring cell with silicone oil filling Measuring cell with inert filling liquid 	30 mbar a (0.435 psi a)	
Upper measuring limit	100% of max. span (max. 160 bar g (2320 psi g) with oxygen measurement and inert liquid)	
Output		
Output signal	4 ... 20 mA	Digital PROFIBUS PA or FOUNDATION Fieldbus signal
<ul style="list-style-type: none"> Lower limit (infinitely adjustable) Upper limit (infinitely adjustable) 	3.55 mA, factory preset to 3.84 mA	-
	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-
Load		
<ul style="list-style-type: none"> Without HART communication With HART communication 	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)	-
Physical bus	-	IEC 61158-2
With polarity reversal protection	-	Yes
Accuracy	To EN 60770-1	
Reference conditions (All error data refer always refer to the set span)	Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span/set span)	
Error in measurement and fixed-point setting (including hysteresis and repeatability)		
<ul style="list-style-type: none"> Linear characteristic 		$\leq 0,075\%$
<ul style="list-style-type: none"> - $r \leq 10$ 	$\leq (0.0029 \cdot r + 0.071)\%$	
<ul style="list-style-type: none"> - $10 < r \leq 30$ 	$\leq (0.0045 \cdot r + 0.071)\%$	
<ul style="list-style-type: none"> - $30 < r \leq 100$ 	$\leq (0.005 \cdot r + 0.05)\%$	
Long-term drift (temperature change ± 30 °C (± 54 °F))	$\leq (0.25 \cdot r)\%$ every 5 years	$\leq 0.25\%$ every 5 years
Influence of ambient temperature		
<ul style="list-style-type: none"> at -10 ... +60 °C (14 ... 140 °F) 	$\leq (0.08 \cdot r + 0.1)\%$ (at 700 bar: $\leq (0.1 \cdot r + 0.2)\%$)	$\leq 0,3\%$
<ul style="list-style-type: none"> at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F) 	$\leq (0.1 \cdot r + 0.15)\%/10 \text{ K}$	$\leq 0.25\%/10 \text{ K}$
Measured Value Resolution	-	$3 \cdot 10^{-5}$ of nominal measuring range

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	HART	PROFIBUS PA or FOUNDATION Fieldbus
Rated operating conditions		
Degree of protection (to EN 60529)	IP65	
Process temperature		
• 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		
- Digital indicators	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Permissible	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	To EN 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)	
Housing material	Poor in copper die-cast aluminium, GD-AISI12 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. 2.4610	
• 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 (max. 160 bar (2320 psi g) with oxygen measurement)	
Process connection	Connection shank G $\frac{1}{2}$ A to DIN EN 837-1, female thread $\frac{1}{2}$ -14 NPT or oval flange (PN 160 (MWP 2320 psi g)) to DIN 19213 with mounting thread M10 or $\frac{7}{16}$ -20 UNF to EN 61518	
Material of the mounting bracket		
• Steel	Sheet steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel	Stainless steel, Mat. No. 1.4301 (SS304)	
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	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
• Startup current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P measuring instruments for pressure

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

DS III series for gage pressure

2

SITRANS P, DS III series for gage pressure

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 99 ATEX 2122	
- Identification	Ex II 1/2 G EEx ia/ib IIB/IIC T6	
- 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 maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Identification	Ex II 1/2 G EEx d IIC T4/T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Identification	Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Identification	Ex II 2 D IP65 T 120 °C	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\text{max}} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\text{max}} = 1.2 \text{ W}$
• Type of protection "n" (zone 2)	TÜV 01 ATEX 1696 X	Planned
- Identification	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection to FM	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	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	

SITRANS P measuring instruments for pressure

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

DS III series
for gage pressure

HART communication

HART communication	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 measuring value) or 10 (two measuring 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 T_{63} , adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	Can be parameterized (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	Can be parameterized (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

Communication FOUNDATION Fieldbus

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 T_{63} , adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	Can be parameterized (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 FF 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

SITRANS P measuring instruments for pressure

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

DS III series for gage pressure

2

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gage pressure, series DS III HART		7 MF 4 0 3 3 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	▶ 1
Inert liquid ¹⁾	Grease-free	▶ 3
Span		
0.01 ... 1 bar g	(0.15 ... 14.5 psi g)	▶ B
0.04 ... 4 bar g	(0.58 ... 58 psi g)	▶ C
0.16 ... 16 bar g	(2.32 ... 232 psi g)	▶ D
0.63 ... 63 bar g	(9.14 ... 914 psi g)	▶ E
1.6 ... 160 bar g	(23.2 ... 2320 psi g)	▶ F
4.0 ... 400 bar g	(58.0 ... 5802 psi g)	▶ G
7.0 ... 700 bar g	(102.0 ... 10153 psi g)	▶ J
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	▶ A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version as diaphragm seal ^{2) 3)}		Y
Process connection		
• Connection shank G $\frac{1}{2}$ B to EN 837-1		▶ 0
• Female thread $\frac{1}{2}$ -14 NPT		1
• Oval flange made of stainless steel		
- Mounting thread $\frac{7}{16}$ -20 UNF to 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 $\frac{1}{2}$ -14 NPT		6
Non-wetted parts materials		
• Housing made of die-cast aluminium		▶ 0
• Housing stainless steel precision casting ⁴⁾		3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		▶ 2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		B
- "Explosion-proof (EEx d) ⁵⁾		D
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d) ⁶⁾		P
- "Ex nA/nL (zone 2)"		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D) ⁶⁾		▶ R
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp) ⁵⁾		NC
Electrical connection / cable entry		
• Screwed gland Pg 13.5 (adapter) ⁷⁾		A
• Screwed gland M20x1.5		▶ B
• Screwed gland $\frac{1}{2}$ -14 NPT		C
• Han 7D plug (plastic housing) incl. mating connector ⁷⁾		D
• M12 connector (metal) ⁸⁾		F

Selection and Ordering data	Order No.
SITRANS P pressure transmitters for gage pressure, series DS III HART	7 MF 4 0 3 3 -
Display	
• Without indicator	0
• Without visible digital indicator (digital indicator hidden, setting: mA)	▶ 1
• With visible digital indicator, setting: mA	6
• with customer-specific digital indicator (setting as specified, Order code "Y21" or "Y22" required)	7

▶ Available ex stock

Power supply units see "SITRANS I power supply units and isolation amplifiers".

Factory-mounting of shut-off valves and valve manifolds see page 2/142.

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

- 1) For oxygen application, add Order code E10.
- 2) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 3) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.
- 4) Not together with Electrical connection „Screwed gland Pg 13.5“ and „Han7D plug“.
- 5) Without cable gland, with blanking plug
- 6) With enclosed cable gland EEx ia and blanking plug
- 7) Not together with type of protection "Explosion-proof" and type of protection "Ex nA".
- 8) Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof"

SITRANS P measuring instruments for pressure

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

**DS III series
for gage pressure**

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gage pressure		
DS III PA (PROFIBUS PA) series		7 MF 4 0 3 4 -
DS III FF series (FOUNDATION Fieldbus)		7 MF 4 0 3 5 -
		■ ■ ■ ■ - ■ ■ ■ ■
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid ¹⁾	Grease-free	3
Nominal measuring range		
1 bar g	(14.5 psi g)	B
4 bar g	(58 psi g)	C
16 bar g	(232 psi g)	D
63 bar g	(914 psi g)	E
160 bar g	(2320 psi g)	F
400 bar g	(5802 psi g)	G
700 bar g	(10153 psi g)	J
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version as diaphragm seal ^{2) 3)}		Y
Process connection		
• Connection shank G $\frac{1}{2}$ A to EN 837-1		0
• Female thread $\frac{1}{2}$ -14 NPT		1
• Oval flange made of stainless steel		
- Mounting thread $\frac{7}{16}$ -20 UNF to EN 61518		2
- Mounting thread M10 to DIN 19213		3
- Mounting thread M12 nach DIN 19213		4
• Male thread M20 x 1,5		5
• Male thread $\frac{1}{2}$ -14 NPT		6
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting		3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		B
- "Explosion-proof (EEx d)" ⁴⁾		D
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ⁵⁾		P
- "Ex nA/nL (zone 2)"		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ⁶⁾ (not for DS III FF)		R
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)" ⁵⁾		NC
Electrical connection / cable entry		
• Screwed gland M20x1.5		B
• Screwed gland $\frac{1}{2}$ -14 NPT		C
• Plug M12 (metal) ⁶⁾		F

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gage pressure		
DS III PA (PROFIBUS PA) series		7 MF 4 0 3 4 -
DS III FF series (FOUNDATION Fieldbus)		7 MF 4 0 3 5 -
		■ ■ ■ ■ - ■ ■ ■ ■
Display		
• Without indicator		0
• Without visible digital indicator (digital indicator hidden, setting: mA)		1
• With visible digital indicator		6
• With customer-specific digital indicator (setting as specified, Order code "Y21" or required)		7

Factory-mounting of shut-off valves and valve manifolds see page 2/142.

The device is delivered together with brief instructions (Leporello) and a CD-ROM containing detailed documentation.

- For oxygen application, add Order code E10.
- When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.
- Without cable gland, with blanking plug.
- With enclosed cable gland EEx ia and blanking plug.
- Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof"

SITRANS P measuring instruments for pressure

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

DS III series for gage pressure

2

Selection and Ordering data		Order code			Selection and Ordering data		Order code				
Further designs Add "-Z" to Order No. and specify Order code.			HART	PA	FF	Additional data Add "-Z" to Order No. and specify Order code.			HART	PA	FF
Pressure transmitter with mounting bracket made of:						Measuring range to be set Specify in plain text (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi		Y01	✓		
• Steel	A01	✓	✓	✓		Measuring point number (TAG No.) Max. 16 characters, specify in plain text: Y15:		Y15	✓	✓	✓
• Stainless steel	A02	✓	✓	✓		Measuring point text Max. 27 characters, specify in plain text: Y16:		Y16	✓	✓	✓
Plug						Entry of HART address (TAG) Max. 8 characters, specify in plain text: Y17:		Y17	✓		
• Han 7D (metal, gray)	A30	✓				Setting of pressure indication in pressure units Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ¹⁾ , inH ₂ O ¹⁾ , ftH ₂ O ¹⁾ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM oder %) ref. temperature 20 °C		Y21	✓	✓	✓
• Han 8U (instead of Han 7D)	A31	✓				Setting of pressure indication in non-pressure units 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	✓		
Cable sockets for M12 connectors (metal)		A50	✓	✓	✓	Preset bus address (possible between 1 and 126) Specify in plain text: Y25:		Y25		✓	
Rating plate inscription (instead of German)						Only "Y01", "Y21", "Y22", "Y25" and "D05" can be factory preset					
• English	B11	✓	✓	✓		✓ = available					
• French	B12	✓	✓	✓		Ordering example					
• Spanish	B13	✓	✓	✓		Item line: 7MF4033-1EA00-1AA7-Z					
• Italian	B14	✓	✓	✓		B line: A01 + Y01 + Y21					
English rating plate		B21	✓	✓	✓	C line: Y01: 10 ... 20 bar (145 ... 290 psi)					
Pressure units in inH ₂ O or psi						C line: Y21: bar (psi)					
Quality inspection certificate (Factory calibration) to IEC 60770-2¹⁾		C11	✓	✓	✓						
Acceptance test certificate²⁾ To EN 10204-3.1		C12	✓	✓	✓						
Factory certificate To EN 10204-2.2		C14	✓	✓	✓						
"Functional Safety (SIL)" certificate		C20	✓								
"PROFIsafe" certificate and protocol		C21		✓							
Setting of upper limit of output signal to 22.0 mA		D05	✓								
Manufacturer's declaration acc. to NACE		D07	✓	✓	✓						
Type of protection IP68 (not together with 7D/ Han 8U plug, cable gland Pg 13.5)		D12	✓	✓	✓						
Digital indicator alongside the input keys (only together with the devices 7MF4033-...-0-.A.6 or -.A.7-Z, Y21 or Y22 + Y01)		D27	✓	✓	✓						
Supplied with oval flange (1 item), PTFE packing and screws in thread of oval flange		D37	✓	✓	✓						
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")		E01	✓	✓	✓						
Use on zone 0 (only together with type of protection "Intrinsic safety (EEx ia)")		E02	✓	✓	✓						
Oxygen application (max. 120 bar g (1740 psi g) at 60°C (140 °F) for oxygen measurement and inert liquid)		E10	✓	✓	✓						
Explosion-proof "Intrinsic safety" to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..)		E25	✓	✓	✓						
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)		E55	✓	✓	✓						
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)		E56	✓	✓	✓						
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)		E57	✓	✓	✓						

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

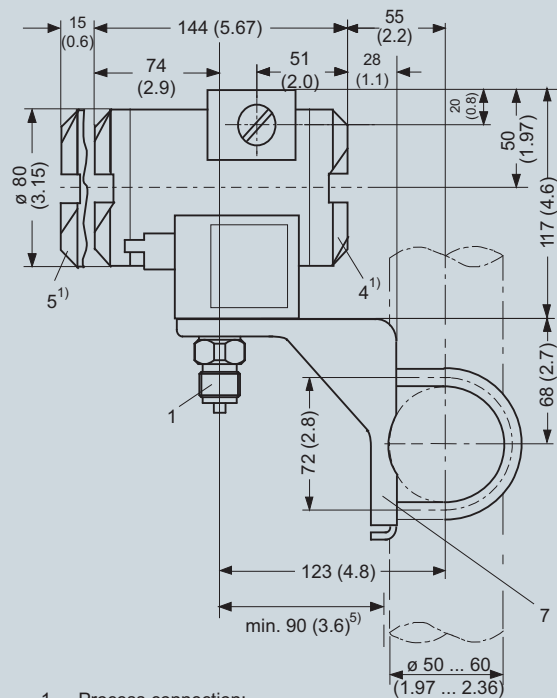
2) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.

SITRANS P measuring instruments for pressure

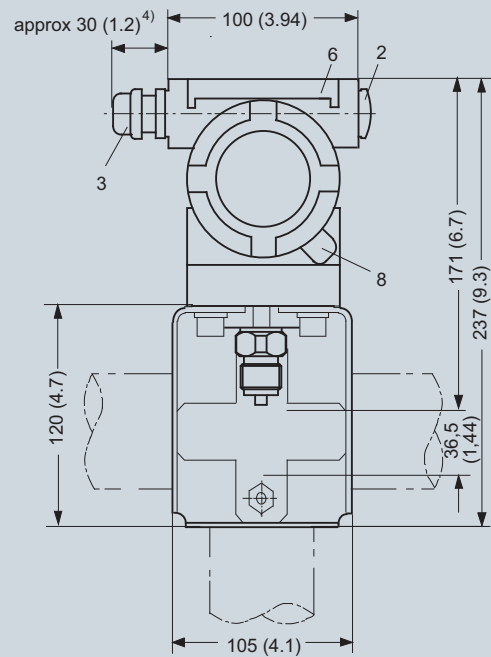
Transmitters for gage, absolute and differential pressure, flow and level

DS III series
for gage pressure

Dimensional drawings



- 1 Process connection:
 - 1/2-14 NPT,
 - connection shank G1/2B or
 - oval flange
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland M20x1,5⁴⁾,
 - screwed gland 1/2-14 NPT or
 - PROFIBUS-Stecker M12³⁾⁴⁾
- 4 Terminal side
- 5 Electronic side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)



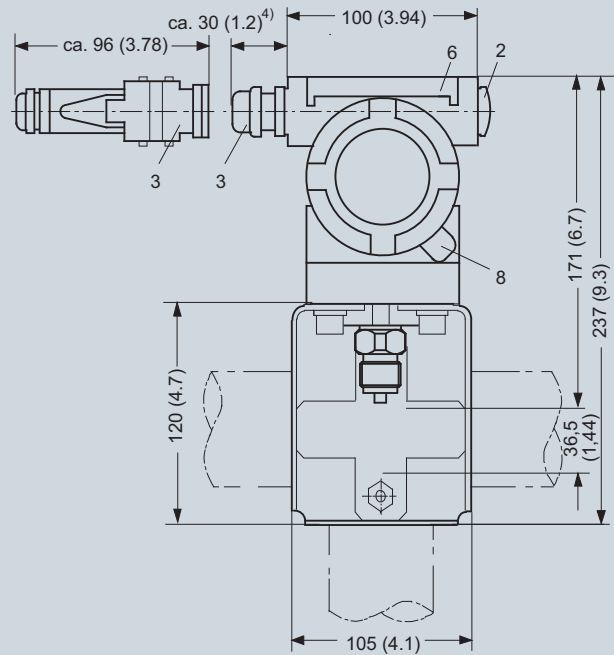
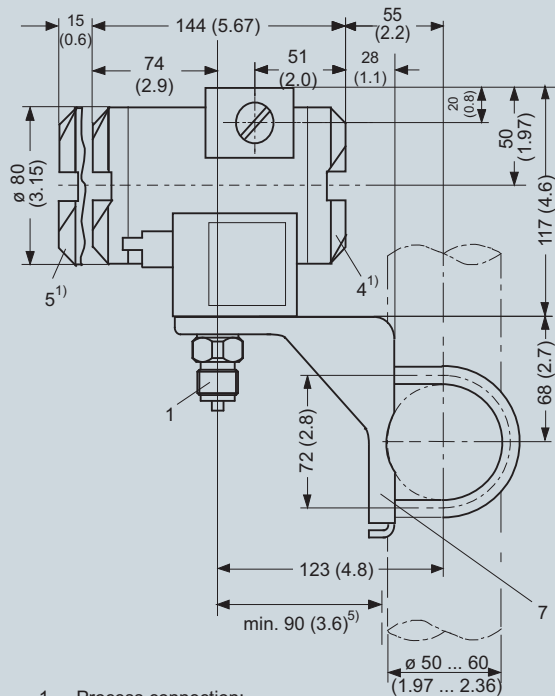
- 1) Allow approx. 20 mm (0.79 inch) thread length in addition
- 2) Minimum distance for rotating
- 3) Not with type of protection "Explosion-proof enclosure"
- 4) Not with type of protection "FM + CSA"

SITRANS P pressure transmitters, DS III HART series for gage pressure, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

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

DS III series for gage pressure



- 1 Process connection:
 - ½-14 NPT,
 - connection shank G ½ B or
 - oval flange
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland Pg 13,5 (adapter)^{2) 3)},
 - screwed gland M20x1,5³⁾,
 - screwed gland ½-14 NPT or
 - Han 7D/ Han 8U^{2) 3)} plug
- 4 Terminal side
- 5 Electronic side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)

- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "Explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA" [is + xp]"
- 4) For Pg 13,5 with adapter approx. 45 mm (1.77 inch)
- 5) Minimum distance for rotating

SITRANS P pressure transmitters, DS III PA and FF series for gage pressure, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

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

DS III series for gage and absolute pressure,
with front-flush diaphragm

Technical specifications

SITRANS P, DS III series for gage and absolute pressure, with front-flush diaphragm

	HART		PROFIBUS PA or FOUNDATION Fieldbus	
Input gage pressure, with front-flush diaphragm				
Measured variable	Gage pressure, flush-mounted			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.01 ... 1 bar g (0.145 ... 14.5 psi g)	6 bar g (87 psi g)	1 bar g (14.5 psi g)	6 bar g (87 psi g)
	0.04 ... 4 bar g (0.58 ... 58 psi g)	10 bar g (145 psi g)	4 bar g (58 psi g)	10 bar g (145 psi g)
	0.16 ... 16 bar g (2.23 ... 232 psi g)	32 bar g (464 psi g)	16 bar g (232 psi g)	32 bar g (464 psi g)
	0.6 ... 63 bar g (9.14 ... 914 psi g)	100 bar g (1450 psi g)	63 bar g (914 psi g)	100 bar g (1450 psi g)
Lower measuring limit	-100 mbar a (-1.45 psi a)			
Upper measuring limit	100% of max. span		100% of nominal measuring range	
Input absolute pressure, with front-flush diaphragm				
Measured variable	Absolute pressure, flush-mounted			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	43 ... 1300 mbar a (0.62 ... 18.9 psi a)	10 bar a (145 psi a)	1300 mbar a (18.9 psi a)	10 bar a (145 psi a)
	0,16 ... 5 bar a (2.32 ... 72,5 psi a)	30 bar a (435 psi a)	5 bar a (72,5 psi a)	30 bar a (435 psi a)
	1 ... 30 bar a (14.5 ... 435 psi a)	100 bar a (1450 psi a)	30 bar a (435 psi a)	100 bar a (1450 psi a)
Lower measuring limit	0 bar a (0 psi a)		Depending on the process connection, the nominal measuring range may differ from these values	
Upper measuring limit	100% of max. span		100% of nominal measuring range	
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA or 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 communication	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V		-	
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
With polarity reversal protection	-		Yes	
Accuracy	To EN 60770-1			
Reference conditions (All error data refer always refer to the set span)	Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span/set span)			
Error in measurement and fixed-point setting (including hysteresis and repeatability)	Gage pressure, front-flushed	Absolute pressure, front-flushed	Gage pressure, front-flushed	Absolute pressure, front-flushed
• Linear characteristic			$\leq 0,075\%$	$\leq 0,2\%$
- $r \leq 10$	$\leq (0.0029 \cdot r + 0.071)\%$	$\leq 0,2\%$		
- $10 < r \leq 30$	$\leq (0.0045 \cdot r + 0.071)\%$	$\leq 0,4\%$		
- $30 < r \leq 100$	$\leq (0.005 \cdot r + 0.05)\%$	-		
Long-term drift (temperature change ± 30 °C (± 54 °F))	$\leq (0.25 \cdot r)\%$ every 5 years		$\leq 0.25\%$ every 5 years	

SITRANS P measuring instruments for pressure

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

DS III series for gage and absolute pressure, with front-flush diaphragm

2

SITRANS P, DS III series for gage and absolute pressure, with front-flush diaphragm

	HART		PROFIBUS PA or FOUNDATION Fieldbus	
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)	$\leq (0.1 \cdot r + 0.2)\%$	$\leq (0.2 \cdot r + 0.3)\%$	$\leq 0.3\%$	$\leq 0.5\%$
• at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F)	$\leq (0.1 \cdot r + 0.15)\%/10 \text{ K}$	$\leq (0.2 \cdot r + 0.3)\%/10 \text{ K}$	$\leq 0.25\%/10 \text{ K}$	$\leq 0.5\%/10 \text{ K}$
Influence of mounting position	0.1 mbar g (0.00145 psi g) per 10° inclination			
Measured Value Resolution	-		$3 \cdot 10^{-5}$ of nominal measuring range	
Influence of the medium temperature (only with front-flush diaphragm)				
• Temperature difference between medium temperature and ambient temperature	3 mbar/10 K (0.04 psi/10 K)			
Rated operating conditions				
<u>Installation conditions</u>				
Ambient temperature	Observe the temperature class in areas subject to explosion hazard.			
• Measuring cell with silicone oil	-40 ... +85 °C (-40 ... +185 °F)			
• Measuring cell with Neobee oil (with front-flush diaphragm)	-10 ... +85 °C (14 ... +185 °F)			
• Measuring cell with inert liquid (not with front-flush diaphragm)	-20 ... +85 °C (-4 ... +185 °F)			
• Digital display	-30 ... +85 °C (-22 ... +185 °F)			
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with Neobee: -20 ... +85 °C (-4 ... +185 °F))			
Climatic class				
Condensation	Permissible			
Degree of protection to EN 60529	IP65, IP68, NEMA X, enclosure cleaning, resistant to lyes, steam to 150° C (302 °F)			
Electromagnetic compatibility				
• Emitted interference and interference immunity	To EN 61326 and NAMUR NE 21			
<u>Medium conditions</u>				
Process temperature				
• Measuring cell with silicone oil	-40 ... +100 °C (-40 ... +212 °F)			
• Measuring cell with silicone oil (with front-flush diaphragm)	-40 ... +150 °C (-40 ... +302 °F)			
• Measuring cell with Neobee oil (with front-flush diaphragm)	-40 ... +150 °C (-40 ... +302 °F)			
• Measuring cell with silicone oil, with temperature isolator (only with front-flush diaphragm)	-40 ... +200 °C (-40 ... +392 °F)			
• Measuring cell with inert liquid	-20 ... +100 °C (-4 ... +212 °F)			
• Measuring cell with high temperature oil	-10 ... +250 °C (14 ... +482 °F)			
Design				
Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)			
Housing material	Poor in copper die-cast aluminium, GD-AISi12 or stainless steel precision casting, mat. No. 1.4408			
Wetted parts materials	Stainless steel, mat. No. 1.4404/316L			
Measuring cell filling	Silicone oil or inert filling liquid			

SITRANS P measuring instruments for pressure

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

DS III series for gage and absolute pressure,
with front-flush diaphragm

SITRANS P, DS III series for gage and absolute pressure, with front-flush diaphragm

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Power supply U_H		Supplied through bus
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
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
• Startup current \leq basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 99 ATEX 2122	
- Identification	Ex II 1/2 G EEx ia/ib IIB/IIC T6	
- 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 maximum 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	$L_i = 7$ μ H, $C_i = 1.1$ nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Identification	Ex II 1/2 G EEx d IIC T4/T6	
- 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	PTB 01 ATEX 2055	
- Identification	Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- 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	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	$L_i = 7$ μ H, $C_i = 1.1$ nF
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Identification	Ex II 2 D IP65 T 120 °C	
- 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; $P_{max} = 1.2$ W
• Type of protection "n" (zone 2)	TÜV 01 ATEX 1696 X	Planned
- Identification	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection to FM	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	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	

Hygiene version

In the case of SITRANS P DSIII with 7MF413x front-flush diaphragm, selected connections comply with the requirements of EHEDG.

SITRANS P measuring instruments for pressure

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

DS III series for gage and absolute pressure, with front-flush diaphragm

2

HART communication

HART communication	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 measuring value) or 10 (two measuring 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 T_{63} , adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	Can be parameterized (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	Can be parameterized (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

Communication FOUNDATION Fieldbus

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 T_{63} , adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	Can be parameterized (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 FF 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

SITRANS P measuring instruments for pressure

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

DS III series for gage and absolute pressure,
with front-flush diaphragm

2

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gage and absolute pressure, front-flush membrane, series DS III HART		7 MF 4 1 3 3 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid	Grease-free	3
FDA compliant fill fluid		
• Neobee oil	Standard	4
Span		
0.01 ... 1 bar g ¹⁾	(0.15 ... 14.5 psi g) ¹⁾	B
0.04 ... 4 bar g	(0.58 ... 58 psi g)	C
0.16 ... 16 bar g	(2.32 ... 232 psi g)	D
0.63 ... 63 bar g	(9.14 ... 914 psi g)	E
13 ... 1300 mbar a ²⁾	(0.19 ... 18.9 psi a) ²⁾	S
0.05 ... 5 bar a ²⁾	(0.7 ... 72.5 psi a) ²⁾	T
3 ... 30 bar a ²⁾	(43.5 ... 435 psi a) ²⁾	U
Wetted parts materials		
Seal diaphragm	Connection shank	
Stainless steel	Stainless steel	A
Process connection		
• Flange version with Order code M..., N..., R.. or Q..		7
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting		3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		B
- "Explosion-proof (EEx d) ³⁾		D
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D) ⁴⁾		R
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp) ³⁾ (available soon)		NC
Electrical connection / cable entry		
• Inner thread M20x1.5		B
• Female thread ½-14 NPT		C
• M12 connectors (metal) ⁵⁾		F
Display		
• Without indicator		0
• Without visible digital indicator (digital indicator hidden, setting: mA)		1
• With visible digital indication, setting: mA		6
• With customer-specific digital indication (setting as specified, Order code "Y21" or "Y22" required)		7

Power supply units see "SITRANS I power supply units and isolation amplifiers".

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

1) Only with "Standard" process connection

2) Not with temperature decoupler P00 and P10, not for process connections R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.

3) Without cable gland, with blanking plug.

4) With enclosed cable gland EEx ia and blanking plug.

5) Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof"

F) Subject to export regulations AL: 91999, ECCN: N.

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gage pressure, front-flush membrane		
DS III PA series (PROFIBUS PA)	F)	7 MF 4 1 3 4 -
DS III FF series (FOUNDATION Fieldbus)	F)	7 MF 4 1 3 5 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid	Grease-free	3
FDA compliant fill fluid		
• Neobee oil	Standard	4
Nominal measuring range		
1 bar g ¹⁾	(14.5 psi g) ¹⁾	B
4 bar g	(58 psi g)	C
16 bar g	(232 psi g)	D
63 bar g	(914 psi g)	E
1300 mbar a ²⁾	(18.9 psi a) ²⁾	S
5 bar a ²⁾	(72.5 psi a) ²⁾	T
30 bar a ²⁾	(435 psi a) ²⁾	U
Wetted parts materials		
Seal diaphragm	Connection shank	
Stainless steel	Stainless steel	A
Process connection		
• Flange version with Order code M..., N..., R.. or Q..		7
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting		3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		B
- "Explosion-proof (EEx d) ³⁾		D
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D) ⁴⁾		R
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp) ³⁾ (available soon)		NC
Electrical connection / cable entry		
• Screwed gland M20x1.5		B
• Screwed gland ½-14 NPT		C
• M12 connectors (metal) ⁵⁾		F
Display		
• Without indicator		0
• Without visible digital indicator (digital indicator hidden, setting: mA)		1
• With visible digital display		6
• With customer-specific digital display (setting as specified, Order code "Y21" or required)		7

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

1) Only with "Standard" process connection

2) Not with temperature decoupler P00 and P10, not for process connections R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.

3) Without cable gland, with blanking plug.

4) With enclosed cable gland EEx ia and blanking plug.

5) Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof"

F) Subject to export regulations AL: 91999, ECCN: N.

SITRANS P measuring instruments for pressure

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

DS III series for gage and absolute pressure, with front-flush diaphragm

2

Selection and Ordering data		Order code			Selection and Ordering data		Order code		
<i>Further designs</i>		HART	PA	FF	<i>Further designs</i>		HART	PA	FF
Add "-Z" to Order No. and specify Order code.					Add "-Z" to Order No. and specify Order code.				
Cable sockets for M12 connectors (metal)	A50	✓	✓	✓	Temperature decoupler up to 200 °C⁴⁾ for version with front-flush diaphragm	P00	✓	✓	✓
Rating plate inscription (instead of German)					Temperature decoupler up to 250 °C Measuring cell filling: High-temperature oil, only in conjunction with measuring cell filling silicone oil	P10	✓	✓	✓
• English	B11	✓	✓	✓	Bio-Control (Neumo) sanitary connection certified to EHEDG				
• French	B12	✓	✓	✓	• DN 50, PN 16	Q53	✓	✓	✓
• Spanish	B13	✓	✓	✓	• DN 65, PN 16	Q54	✓	✓	✓
• Italian	B14	✓	✓	✓	Sanitary process connection to DRD • 65 mm, PN 40	M32	✓	✓	✓
English rating plate Pressure units in inH ₂ O or psi	B21	✓	✓	✓	SMS socket with union nut				
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11	✓	✓	✓	• 2"	M67	✓	✓	✓
Acceptance test certificate To EN 10204-3.1	C12	✓	✓	✓	• 2½"	M68	✓	✓	✓
Factory certificate To EN 10204-2.2	C14	✓	✓	✓	• 3"	M69	✓	✓	✓
"PROFIsafe" certificate and protocol	C21		✓		SMS threaded socket				
Flanges to EN 1092-1					• 2"	M73	✓	✓	✓
• DN 25, PN 40 ¹⁾	M11	✓	✓	✓	• 2½"	M74	✓	✓	✓
• DN 25, PN 100 ¹⁾	M21	✓	✓	✓	• 3"	M75	✓	✓	✓
• DN 40, PN 40	M13	✓	✓	✓	IDF socket with union nut ISO 2853				
• DN 40, PN 100	M23	✓	✓	✓	• 2"	M82	✓	✓	✓
• DN 50, PN 16	M04	✓	✓	✓	• 2½"	M83	✓	✓	✓
• DN 50, PN 40	M14	✓	✓	✓	• 3"	M84	✓	✓	✓
• DN 80, PN 16	M06	✓	✓	✓	IDF threaded socket ISO 2853				
• DN 80, PN 40	M16	✓	✓	✓	• 2"	M92	✓	✓	✓
Flanges to ASME B16.5					• 2½"	M93	✓	✓	✓
• Stainless steel flange 1" class 150 ¹⁾	M40	✓	✓	✓	• 3"	M94	✓	✓	✓
• Stainless steel flange 1½" class 150	M41	✓	✓	✓	Sanitary process connection to NEUMO Bio-Connect screw connection certified to EHEDG				
• Stainless steel flange 2" class 150	M42	✓	✓	✓	• DN 50, PN 16	Q05	✓	✓	✓
• Stainless steel flange 3" class 150	M43	✓	✓	✓	• DN 65, PN 16	Q06	✓	✓	✓
• Stainless steel flange 4" class 150	M44	✓	✓	✓	• DN 80, PN 16	Q07	✓	✓	✓
• Stainless steel flange 1" class 300 ¹⁾	M45	✓	✓	✓	• DN 100, PN 16	Q08	✓	✓	✓
• Stainless steel flange 1½" class 300	M46	✓	✓	✓	• DN 2", PN 16	Q13	✓	✓	✓
• Stainless steel flange 2" class 300	M47	✓	✓	✓	• DN 2½", PN 16	Q14	✓	✓	✓
• Stainless steel flange 3" class 300	M48	✓	✓	✓	• DN 3", PN 16	Q15	✓	✓	✓
• Stainless steel flange 4" class 300	M49	✓	✓	✓	• DN 4", PN 16	Q16	✓	✓	✓
Threaded connection acc. to DIN 3852-2, Form A					Sanitary process connection to NEUMO Bio-Connect flange connection certified to EHEDG				
• G ¾", flush-mounted ²⁾	R01	✓	✓	✓	• DN 50, PN 16	Q23	✓	✓	✓
• G 1", flush-mounted ²⁾	R02	✓	✓	✓	• DN 65, PN 16	Q24	✓	✓	✓
• G 2", flush-mounted ²⁾	R04	✓	✓	✓	• DN 80, PN 16	Q25	✓	✓	✓
Tank connection³⁾ Sealing is included in delivery					• DN 100, PN 16	Q26	✓	✓	✓
• TG 52/50, PN 40	R10	✓	✓	✓	• DN 2", PN 16	Q31	✓	✓	✓
• TG 52/150, PN 40	R11	✓	✓	✓	• DN 2½", PN 16	Q32	✓	✓	✓
Sanitary process connection according DIN 11851 (Dairy connection)					• DN 3", PN 16	Q33	✓	✓	✓
• DN 50, PN 25	N04	✓	✓	✓	• DN 4", PN 16	Q34	✓	✓	✓
• DN 80, PN 25	N06	✓	✓	✓	Sanitary process connection to NEUMO Bio-Connect clamp connection certified to EHEDG				
Tri-Clamp connection according DIN 32676/ISO 2852					• DN 50, PN 16	Q39	✓	✓	✓
• DN 50/2", PN 16	N14	✓	✓	✓	• DN 65, PN 10	Q40	✓	✓	✓
• DN 65/3", PN 10	N15	✓	✓	✓	• DN 80, PN 10	Q41	✓	✓	✓
Varivent connection certified to EHEDG					• DN 100, PN 10	Q42	✓	✓	✓
• Type N = 68 for Varivent housing DN 40 ... 125 and 1½" ... 6", PN 40	N28	✓	✓	✓	• DN 2½", PN 16	Q48	✓	✓	✓
					• DN 3", PN 10	Q49	✓	✓	✓
					• DN 4", PN 10	Q50	✓	✓	✓

SITRANS P measuring instruments for pressure

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

DS III series for gage and absolute pressure,
with front-flush diaphragm

Selection and Ordering data	Order code		
<i>Further designs</i>	HART	PA	FF
Add "-Z" to Order No. and specify Order code.			
Sanitary process connection to NEUMO Connect S flange connection certified to EHEDG			
• DN 50, PN 16	Q63	✓	✓
• DN 65, PN 10	Q64	✓	✓
• DN 80, PN 10	Q65	✓	✓
• DN 100, PN 10	Q66	✓	✓
• DN 2", PN 16	Q72	✓	✓
• DN 2½", PN 10	Q73	✓	✓
• DN 3", PN 10	Q74	✓	✓
• DN 4", PN 10	Q75	✓	✓
Aseptic threaded socket to DIN 11864-1 Form A			
• DN 50, PN 25	N33	✓	✓
• DN 65, PN 25	N34	✓	✓
• DN 80, PN 25	N35	✓	✓
• DN 100, PN 25	N36	✓	✓
Aseptic flange with notch to DIN 11864-2 Form A			
• DN 50, PN 16	N43	✓	✓
• DN 65, PN 16	N44	✓	✓
• DN 80, PN 16	N45	✓	✓
• DN 100, PN 16	N46	✓	✓
Aseptic flange with groove to DIN 11864-2 Form A			
• DN 50, PN 16	N43 + P11	✓	✓
• DN 65, PN 16	N44 + P11	✓	✓
• DN 80, PN 16	N45 + P11	✓	✓
• DN 100, PN 16	N46 + P11	✓	✓
Aseptic clamp with groove to DIN 11864-3 Form A			
• DN 50, PN 25	N53	✓	✓
• DN 65, PN 25	N54	✓	✓
• DN 80, PN 16	N55	✓	✓
• DN 100, PN 16	N56	✓	✓

1) Special Viton seal included in delivery.

2) Lower measuring limit -100 mbar g (1.45 psi g).

3) The weldable socket can be ordered under accessories

4) The maximum temperatures of the medium depend on the respective cell fillings.

Selection and Ordering data	Order code		
<i>Additional data</i>	HART	PA	FF
Add "-Z" to Order No. and specify Order code.			
Measuring range to be set Specify in plain text (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓	
Measuring point number (TAG No.) Max. 16 characters, specify in plain text: Y15:	Y15	✓	✓
Measuring point text Max. 27 characters, specify in plain text: Y16:	Y16	✓	✓
Setting of pressure indicator in pressure units Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ^{*)} , inH ₂ O ^{*)} , ftH ₂ O ^{*)} , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM oder %) ref. temperature 20 °C	Y21	✓	✓
Preset bus address (possible between 1 and 126) Specify in plain text: Y25:	Y25		✓

Only "Y01" and "Y21" can be factory preset

✓ = available

Ordering example

Item line: 7MF4133-1DB20-1AB7-Z

B line: A22 + Y01 + Y21

C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)

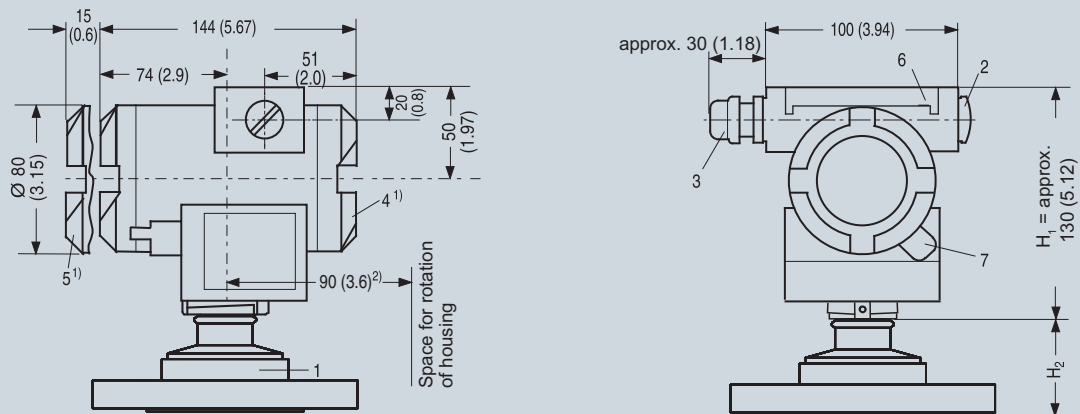
C line: Y21: bar (psi)

SITRANS P measuring instruments for pressure

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

DS III series for gage and absolute pressure,
with front-flush diaphragm

Dimensional drawings



- 1 Process connection: see flange tables
- 2 Blanking plug
- 3 Electrical connection:
- screwed gland M20x1.5
- screwed gland 1/2-14 NPT
- 4 Terminal side
- 5 Electronics side, digital display (longer overall length for the window)
- 6 Protective cover over keys
- 7 Screw cover safety bracket (only for explosion-proof enclosure, not shown in the drawing)

- 1) Allow approx. 20 mm (0.79 inch) thread length in addition
- 2) 92 mm (3.6 inch) for minimum distance to permit rotation with indicator

SITRANS P pressure transmitters, DS III series for gage pressure, with front-flush diaphragm, dimensions in mm (inch)

The diagram shows a SITRANS P DS III with an example of a flange. In this drawing the height is subdivided into H_1 and H_2 .

H_1 = Height of the SITRANS DS III up to a defined cross-section

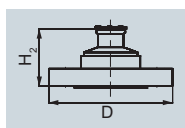
H_2 = Height of the flange up to this defined cross-section

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

Flanges to EN and ASME

Flanges to EN

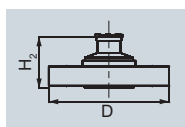
EN 1092-1



DN	PN	ØD	H_2
25	40	115 mm (4.5")	Approx. 52 mm (2")
25	100	140 mm (5.5")	
40	40	150 mm (5.9")	
40	100	170 mm (6.7")	
50	16	165 mm (6.5")	
50	40	165 mm (6.5")	
80	16	200 mm (7.9")	
80	40	200 mm (7.9")	

Flanges to ASME

ASME B16.5

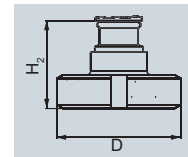


DN	class	ØD	H_2
1"	150	110 mm (4.3")	Approx. 52 mm (2")
1"	300	125 mm (4.9")	
1½"	150	130 mm (5.1")	
1½"	300	155 mm (6.1")	
2"	150	150 mm (5.9")	
2"	300	165 mm (6.5")	
3"	150	190 mm (7.5")	
3"	300	210 mm (8.1")	
4"	150	230 mm (9.1")	
4"	300	255 mm (10.0")	

NuG and pharmaceutical connections

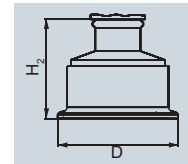
Connections to DIN

DIN 11851 (Dairy connection)



DN	PN	ØD	H_2
50	25	92 mm (3.6")	Approx. 52 mm (2")
80	25	127 mm (5.0")	

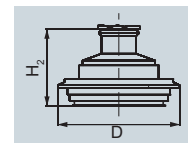
Tri-Clamp according DIN 32676



DN	PN	ØD	H_2
50	16	64 mm (2.5")	Approx. 52 mm (2")
65	16	91 mm (3.6")	

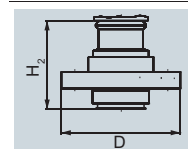
Other connections

Varivent connection



DN	PN	ØD	H_2
40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

Bio-Control connection



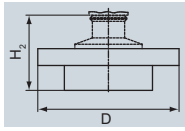
DN	PN	ØD	H_2
50	16	90 mm (3.5")	Approx. 52 mm (2")
65	16	120 mm (4.7")	

SITRANS P measuring instruments for pressure

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

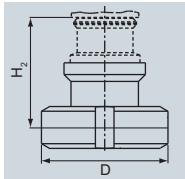
DS III series for gage and absolute pressure, with front-flush diaphragm

Sanitary process connection to DRD



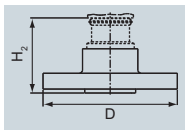
DN	PN	ØD	H ₂
50	40	105 mm (4.1")	Approx. 52 mm (2")

Sanitary process screw connection to NEUMO Bio-Connect



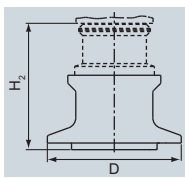
DN	PN	ØD	H ₂
50	16	82 mm (3.2")	Approx. 52 mm (2")
65	16	105 mm (4.1")	
80	16	115 mm (4.5")	
100	16	145 mm (5.7")	
2"	16	82 mm (3.2")	
2½"	16	105 mm (4.1")	
3"	16	105 mm (4.1")	
4"	16	145 mm (5.7")	

Sanitary connection to NEUMO Bio-Connect flange connection



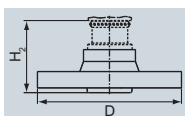
DN	PN	ØD	H ₂
50	16	110 mm (4.3")	Approx. 52 mm (2")
65	16	140 mm (5.5")	
80	16	150 mm (5.9")	
100	16	175 mm (6.9")	
2"	16	100 mm (3.9")	
2½"	16	110 mm (4.3")	
3"	16	140 mm (5.5")	
4"	16	175 mm (6.9")	

Sanitary connection to NEUMO Bio-Connect clamp connection



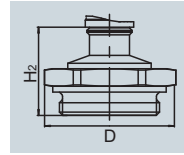
DN	PN	ØD	H ₂
50	16	77,4 mm (3.0")	Approx. 52 mm (2")
65	10	90,9 mm (3.6")	
80	10	106 mm (4.2")	
100	10	119 mm (4.7")	
2"	16	64 mm (2.5")	
2½"	16	77,4 mm (3.0")	
3"	10	90,9 mm (3.6")	
4"	10	119 mm (4.7")	

Sanitary connection to NEUMO Bio-Connect S flange connection



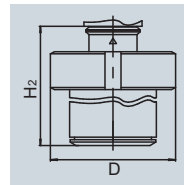
DN	PN	ØD	H ₂
50	16	125 mm (4.9")	Approx. 52 mm (2")
65	10	145 mm (5.7")	
80	10	155 mm (6.1")	
100	10	180 mm (7.1")	
2"	16	125 mm (4.9")	
2½"	10	135 mm (5.3")	
3"	10	145 mm (5.7")	
4"	10	180 mm (7.1")	

Thread connection G¾", G1" and G2" to DIN 3852



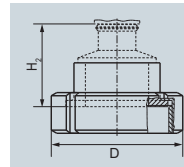
DN	PN	ØD	H ₂
¾"	63	37 mm (1.5")	Approx. 45 mm (1.8")
1"	63	48 mm (1.9")	Approx. 47 mm (1.9")
2"	63	78 mm (3.1")	Approx. 52 mm (2")

Tank connection TG52/50 and TG52/150



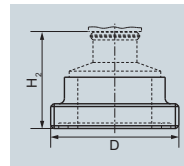
DN	PN	ØD	H ₂
25	40	63 mm (2.5")	Approx. 63 mm (2.5")
25	40	63 mm (2.5")	Approx. 170 mm (6.7")

SMS socket with union nut



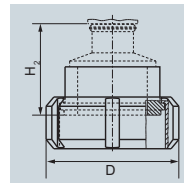
DN	PN	ØD	H ₂
2"	25	84 mm (3.3")	Approx. 52 mm (2.1")
2½"	25	100 mm (3.9")	
3"	25	114 mm (4.5")	

SMS threaded socket



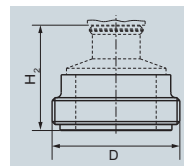
DN	PN	ØD	H ₂
2"	25	70 x 1/6 mm	Approx. 52 mm (2.1")
2½"	25	85 x 1/6 mm	
3"	25	98 x 1/6 mm	

IDF socket with union nut



DN	PN	ØD	H ₂
2"	25	77 mm (3")	Approx. 52 mm (2.1")
2½"	25	91 mm (3.6")	
3"	25	106 mm (4.2")	

IDF threaded socket



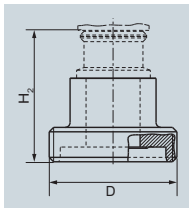
DN	PN	ØD	H ₂
2"	25	64 mm (2.5")	Approx. 52 mm (2.1")
2½"	25	77.5 mm (3.1")	
3"	25	91 mm (3.6")	

SITRANS P measuring instruments for pressure

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

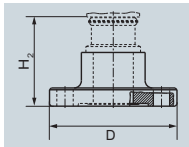
DS III series for gage and absolute pressure,
with front-flush diaphragm

Aseptic threaded socket to DIN 11864-1 Form A



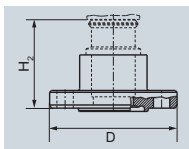
DN	PN	ØD	H ₂
50	25	78 x 1/6"	Approx. 52 mm (2.1")
65	25	95 x 1/6"	
80	25	110 x 1/4"	
100	25	130 x 1/4"	

Aseptic flange with notch to DIN 11864-2 Form A



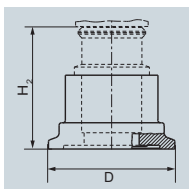
DN	PN	ØD	H ₂
50	16	94	Approx. 52 mm (2.1")
65	16	113	
80	16	133	
100	16	159	

Aseptic flange with groove to DIN 11864-2 Form A



DN	PN	ØD	H ₂
50	16	94	Approx. 52 mm (2.1")
65	16	113	
80	16	133	
100	16	159	

Aseptic clamp with groove to DIN 11864-3 Form A



DN	PN	ØD	H ₂
50	25	77,5	Approx. 52 mm (2.1")
65	25	91	
80	16	106	
100	16	130	

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure
(from gage pressure series)

Technical specifications

SITRANS P, DS III series for absolute pressure (from the gage pressure series)

	HART		PROFIBUS PA or FOUNDATION Fieldbus	
Input	Absolute pressure			
Measured variable	Span			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure		Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	8.3 ... 250 mbar a (0.12 ... 3.6 psi a)	6 bar a (87 psi a)	250 mbar a (3.6 psi a)	6 bar a (87 psi a)
	43 ... 1300 mbar a (0.62 ... 18.9 psi a)	10 bar a (145 psi a)	1300 mbar a (18.9 psi a)	10 bar a (145 psi a)
	160 ... 5000 mbar a (2.32 ... 72.5 psi a)	30 bar a (435 psi a)	5 bar a (72.5 psi a)	30 bar a (435 psi a)
	1 ... 30 bar a (14.5 ... 435 psi a)	100 bar a (1450 psi a)	30 bar a (435 psi a)	100 bar a (1450 psi a)
Lower measuring limit	0 mbar a (0 psi a)			
• Measuring cell with silicone oil filling	100% of max. span			
Upper measuring limit	100% of max. span			
Output	4 ... 20 mA		Digital PROFIBUS PA or FOUNDATION Fieldbus signal	
Output signal	3.55 mA, factory preset to 3.84 mA		-	
• Lower limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
• Upper limit (infinitely adjustable)				
Load				
• Without HART communication	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω U_H : Power supply in V		-	
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
With polarity reversal protection	-		Yes	
Accuracy	To EN 60770-1			
Reference conditions (All error data refer always refer to the set span)	Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span / set span)			
Error in measurement and fixed-point setting (including hysteresis and repeatability)				
• Linear characteristic			≤ 0.1%	
- r ≤ 10	≤ 0.1%			
- 10 < r ≤ 30	≤ 0.2%			
Long-term drift (temperature change ±30 °C (±54 °F))	≤ (0.1 · r)%/year		≤ 0.1%/year	
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)	≤ (0.1 · r + 0.2)%		≤ 0,3%	
• at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F)	≤ (0.1 · r + 0.15)%/10 K		≤ 0.25%/10 K	
Measured Value Resolution	-		$3 \cdot 10^{-5}$ of nominal measuring range	

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure (from gage pressure series)

2

SITRANS P, DS III series for absolute pressure (from the gage pressure series)

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Rated operating conditions		
Degree of protection (to EN 60529)	IP65	
Process temperature		
• 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		
- Digital indicators	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Permissible	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	To EN 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)	
Housing material	Poor in copper die-cast aluminium, GD-AISI12 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. 2.4610	
• 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 (max. 160 bar a (2320 psi a) with oxygen measurement)	
Process connection	Connection shank G½A to DIN EN 837-1, female thread ½ -14 NPT or oval flange (PN 160 (MWP 2320 psi a)) to DIN 19213 with mounting thread M10 or 7/16-20 UNF to EN 61518	
Material of the mounting bracket		
• Steel	Sheet steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel	Stainless steel, Mat. No. 1.4301 (SS304)	
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	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
• Startup current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure
(from gage pressure series)

SITRANS P, DS III series for absolute pressure (from the gage pressure series)

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 99 ATEX 2122	
- Identification	Ex II 1/2 G EEx ia/ib IIB/IIC T6	
- 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 maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Identification	Ex II 1/2 G EEx d IIC T4/T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Identification	Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Identification	Ex II 2 D IP65 T 120 °C	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\text{max}} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\text{max}} = 1.2 \text{ W}$
• Type of protection "n" (zone 2)	TÜV 01 ATEX 1696 X	Planned
- Identification	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection to FM	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	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	

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure (from gage pressure series)

HART communication

HART communication	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 measuring value) or 10 (two measuring 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 T_{63} , adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	Can be parameterized (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	Can be parameterized (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

Communication FOUNDATION Fieldbus

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 T_{63} , adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	Can be parameterized (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 FF 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

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure
(from gage pressure series)

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for absolute pressure, from the pressure series DS III HART ^{F)}		7 MF 4 2 3 3 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Inert liquid ¹⁾	Grease-free	3
Span		
8.3 ... 250 mbar a	(0.12 ... 3.63 psi a)	D
43 ... 1300 mbar a	(0.62 ... 18.9 psi a)	F
0.16 ... 5 bar a	(2.32 ... 72.5 psi a)	G
1 ... 30 bar a	(14.5 ... 435 psi a)	H
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version for diaphragm seal ²⁾³⁾⁴⁾		Y
Process connection		
• Connection shank G $\frac{1}{2}$ B to EN 837-1		0
• Female thread $\frac{1}{2}$ -14 NPT		1
• Oval flange made of stainless steel		
- Mounting thread $\frac{7}{16}$ -20 UNF to EN 61518		2
- Mounting thread M10 to DIN 19213		3
• Male thread M20 x 1,5		5
• Male thread $\frac{1}{2}$ -14 NPT		6
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting ⁵⁾		3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		B
- "Explosion-proof (EEx d) ⁶⁾ "		D
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d) ⁷⁾ "		P
- "Ex nA/nL (zone 2)"		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D) ⁷⁾ "		R
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp) ⁶⁾ "		NC
Electrical connection / cable entry		
• Screwed gland Pg 13.5 ⁸⁾		A
• Screwed gland M20x1.5		B
• Screwed gland $\frac{1}{2}$ -14 NPT		C
• Han 7D plug (plastic housing) incl. mating connector ⁸⁾		D
• Plug M12 (metal) ⁹⁾		F

Selection and Ordering data Order No.
SITRANS P pressure transmitters for absolute pressure, from the pressure series DS III HART ^{F)} **7 MF 4 2 3 3 -**

Display

- Without indicator **0**
- Without visible digital indicator (digital indicator hidden, setting: mA) **1**
- With visible digital indicator **6**
- With customer-specific digital indicator (setting as specified, Order code "Y21" or required) **7**

Power supply units see "SITRANS I power supply units and isolation amplifiers".

Factory-mounting of shut-off valves and valve manifolds see page 2/142.

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

- 1) For oxygen application, add Order code E10.
- 2) Version 7MF4233-1DY... only up to max. span 200 mbar a (2.9 psi a)
- 3) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 4) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.
- 5) Not together with Electrical connection „Screwed gland Pg 13.5“ and „Han7D plug“.
- 6) Without cable gland, with blanking plug.
- 7) With enclosed cable gland EEx ia and blanking plug.
- 8) Not together with type of protection "Explosion-proof" and type of protection "Ex nA".
- 9) Not together with types of protection "Explosion-proof" or "Intrinsic safety and explosion-proof"

F) Subject to export regulations AL: 9I999, ECCN: N.

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure (from gage pressure series)

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for absolute pressure (from the gage pressure series)		
DS III PA series (PROFIBUS PA)	F)	7 MF 4 2 3 4 -
DS III FF series (FOUNDATION Fieldbus)	F)	7 MF 4 2 3 5 -
Measuring cell filling		
Silicone oil	Standard	1
Inert liquid ¹⁾	Grease-free	3
Nominal measuring range		
250 mbar a	(3.63 psi a)	D
1300 mbar a	(18.9 psi a)	F
5 bar a	(72.5 psi a)	G
30 bar a	(435 psi a)	H
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version as diaphragm seal ²⁾³⁾⁴⁾		Y
Process connection		
• Connection shank G½B to EN 837-1		0
• Female thread ½-14 NPT		1
• Oval flange made of stainless steel		
- Mounting thread 7/16-20 UNF to EN 61518		2
- Mounting thread M10 to DIN 19213		3
• 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		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		B
- "Explosion-proof (EEx d) ⁵⁾ "		D
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d) ⁶⁾ "		P
- "Ex nA/nL (zone 2)"		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D) ⁶⁾ " (not for DS III FF)		R
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp) ⁵⁾ "		NC
Electrical connection / cable entry		
• Screwed gland M20x1.5		B
• Screwed gland ½-14 NPT		C
• Plug M12 incl. mating connector ⁷⁾		F

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for absolute pressure (from the gage pressure series)		
DS III PA series (PROFIBUS PA)	F)	7 MF 4 2 3 4 -
DS III FF series (FOUNDATION Fieldbus)	F)	7 MF 4 2 3 5 -
Display		
• Without indicator		0
• Without visible digital indicator (digital indicator hidden, setting: mA)		1
• With visible digital indicator		6
• With customer-specific digital indicator (setting as specified, Order code "Y21" or required)		7

Factory-mounting of shut-off valves and valve manifolds see page 2/142.

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation

- For oxygen application, add Order code E10.
- Version 7MF4233-1DY... only up to max. span 200 mbar a (2.9 psi a).
- When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.
- Without cable gland, with blanking plug.
- With enclosed cable gland EEx ia and blanking plug.
- Not together with types of protection "Explosion-proof" or "Intrinsic safety and explosion-proof"

F) Subject to export regulations AL: 91999, ECCN: N.

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure
(from gage pressure series)

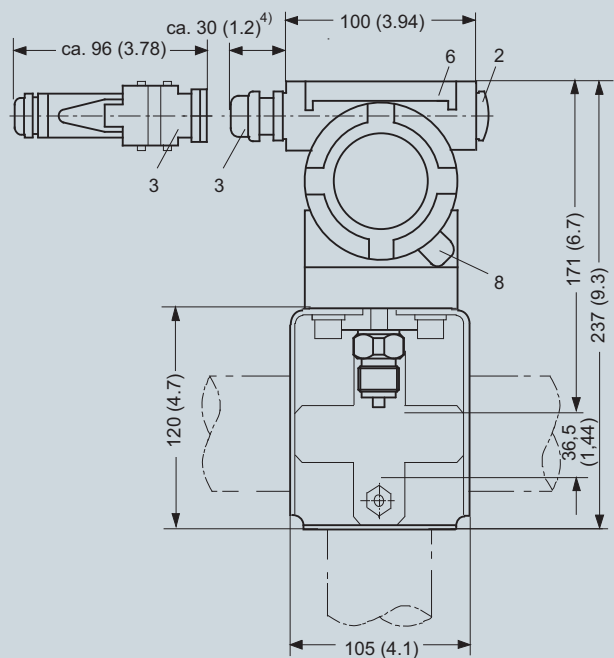
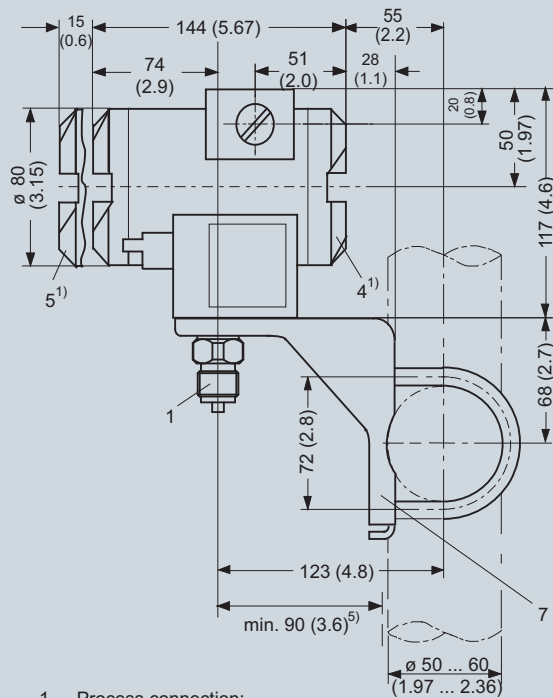
Selection and Ordering data	Order code			Selection and Ordering data	Order code				
Further designs		HART	PA	FF	Additional data		HART	PA	FF
Add "-Z" to Order No. and specify Order code.					Add "-Z" to Order No. and specify Order code.				
Pressure transmitter with mounting bracket made of:					Measuring range to be set	Y01	✓		
• Steel	A01	✓	✓	✓	Specify in plain text (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi				
• Stainless steel	A02	✓	✓	✓	Measuring point number (TAG No.)	Y15	✓	✓	✓
Plug					Max. 16 characters, specify in plain text: Y15:				
• Han 7D (metal, gray)	A30	✓			Measuring point text	Y16	✓	✓	✓
• Han 8U (instead of Han 7D)	A31	✓			Max. 27 characters, specify in plain text: Y16:				
Cable sockets for M12 connectors (metal)	A50	✓	✓	✓	Entry of HART address (TAG)	Y17	✓		
Rating plate inscription (instead of German)					Max. 8 characters, specify in plain text: Y17:				
• English	B11	✓	✓	✓	Setting of pressure indication in pressure units	Y21	✓	✓	✓
• French	B12	✓	✓	✓	Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ...				
• Spanish	B13	✓	✓	✓	Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ¹ , inH ₂ O ¹ , ftH ₂ O ¹ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM oder % (*) ref. temperature 20 °C				
• Italian	B14	✓	✓	✓	Setting of pressure indication in non-pressure units	Y22 + Y01	✓	✓	✓
English rating plate	B21	✓	✓	✓	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)				
Pressure units in inH ₂ O or psi					Preset bus address	Y25		✓	
Quality inspection certificate (Factory calibration) to IEC 60770-2¹⁾	C11	✓	✓	✓	(possible between 1 and 126) Specify in plain text: Y25:				
Acceptance test certificate²⁾ To EN 10204-3.1	C12	✓	✓	✓	Only "Y01", "Y21", "Y22", "Y25" and "D05" can be factory preset				
Factory certificate To EN 10204-2.2	C14	✓	✓	✓	✓ = available				
"Functional Safety (SIL)" certificate	C20	✓			1) When the manufacture's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here.				
"PROFIsafe" certificate and protocol	C21		✓		2) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.				
Setting of upper limit of output signal to 22.0 mA	D05	✓							
Manufacturer's declaration acc. to NACE	D07	✓	✓	✓					
Type of protection IP68 (not together with Han 7D / Han 8U plug, Pg 13.5 screwed gland)	D12	✓	✓	✓					
Digital indicator alongside the input keys (only together with the devices 7MF4233-....0-.A.6 or -.A.7-Z, Y21 or Y22 + Y01).	D27	✓	✓	✓					
Supplied with oval flange (1 item), PTFE packing and screws in thread of oval flange	D37	✓	✓	✓					
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	E01	✓	✓	✓					
Use on zone 0 (only together with type of protection "Intrinsic safety (EEx ia)")	E02	✓	✓	✓					
Oxygen application (max. 120 bar a (1740 psi a) at 60 °C (140 °F) with oxygen measurement and inert liquid)	E10	✓	✓	✓					
Explosion-proof "Intrinsic safety" to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..)	E25	✓	✓	✓					
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)	E55	✓	✓	✓					
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)	E56	✓	✓	✓					
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)	E57	✓	✓	✓					

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure
(from gage pressure series)

Dimensional drawings



- 1 Process connection:
 - ½-14 NPT,
 - connection shank G½B or
 - oval flange
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland Pg 13,5 (adapter)²⁾³⁾,
 - screwed gland M20x1,5³⁾,
 - screwed gland ½-14 NPT or
 - Han 7D/ Han 8U²⁾³⁾ plug
- 4 Terminal side
- 5 Electronic side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)

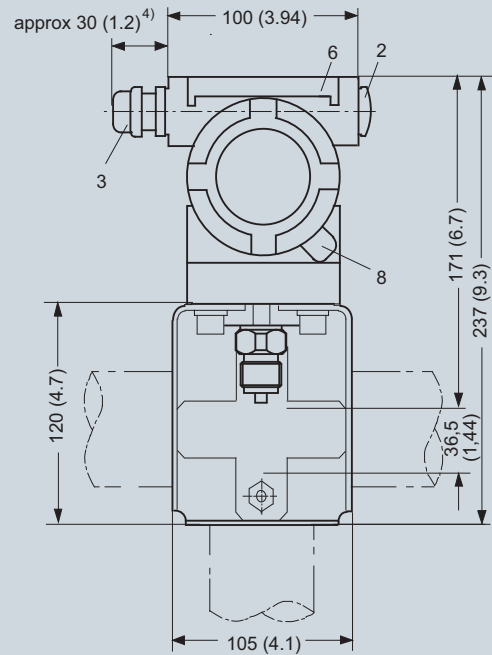
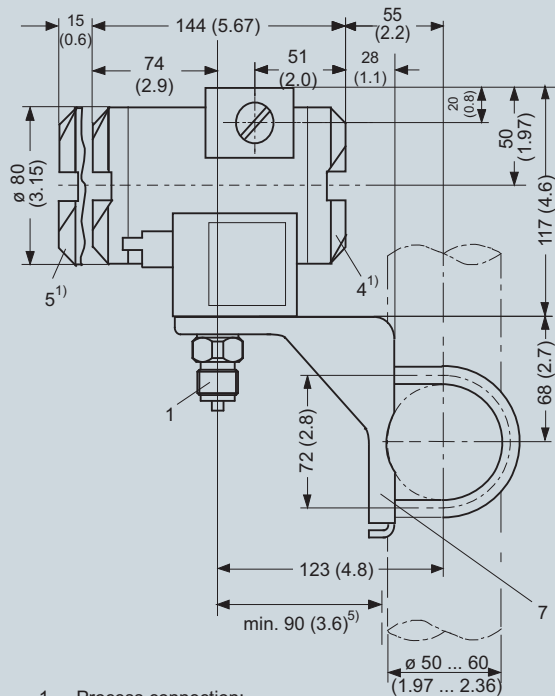
- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "Explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA" [is + xp]"
- 4) For Pg 13,5 with adapter approx. 45 mm (1.77 inch)
- 5) Minimum distance for rotating

SITRANS P pressure transmitters, DS III HART series for absolute pressure, from the pressure series, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure
(from gage pressure series)



- 1 Process connection:
 - ½-14 NPT,
 - connection shank G½B or
 - oval flange
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland M20x1,5⁴⁾,
 - screwed gland ½-14 NPT or
 - PROFIBUS-Stecker M12³⁾⁴⁾
- 4 Terminal side
- 5 Electronic side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)

- 1) Allow approx. 20 mm (0.79 inch) thread length in addition
- 2) Minimum distance for rotating
- 3) Not with type of protection "Explosion-proof enclosure"
- 4) Not with type of protection "FM + CSA"

SITRANS P pressure transmitters, DS III PA and FF series for absolute pressure, from the pressure series, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure
(from differential pressure series)

Technical specifications

SITRANS P, DS III series for absolute pressure (from differential pressure series)

	HART	PROFIBUS PA or FOUNDATION Fieldbus	
Input	Absolute pressure pressure		
Measured variable	Span		
Spans (infinitely adjustable) or nominal measuring range and max. permissible working pressure	Maximum working pressure	Nominal measuring range	Maximum working pressure
	8.3 ... 250 mbar a (0.12 ... 3.6 psi a)	32 bar a (464 psi a)	250 mbar a (3.6 psi a)
	43 ... 1300 mbar a (0.62 ... 18.9 psi a)	32 bar a (464 psi a)	1300 bar a (18.9 psi a)
	160 ... 5000 mbar a (2.32 ... 72.5 psi a)	32 bar a (464 psi a)	5 bar a (72.5 psi a)
	1 ... 30 bar a (14.5 ... 435 psi a)	160 bar a (2320 psi a)	30 bar a (435 psi a)
	5.3 ... 100 bar a (77 ... 1450 psi a)	160 bar a (2320 psi a) (for connection thread M10 and $\frac{7}{16}$ -20 UNF in the process flanges)	100 bar a (1450 psi a)
Lower measuring limit	0 mbar a (0 psi a)		
• Measuring cell with silicone oil filling	100% of max. span		
Upper measuring limit			
Output	4 ... 20 mA		
Output signal	Digital PROFIBUS PA or 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 communication	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V		
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)		
Physical bus	-		
With polarity reversal protection	-		
	IEC 61158-2		
	Yes		
Accuracy	To EN 60770-1		
Reference conditions (All error data refer always refer to the set span)	Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span / set span)		
Error in measurement and fixed-point setting (including hysteresis and repeatability)			
• Linear characteristic	$\leq 0.1\%$		
- r \leq 10	$\leq 0.1\%$		
- 10 < r \leq 30	$\leq 0.2\%$		
Long-term drift (temperature change ± 30 °C (± 54 °F))	$\leq (0.1 \cdot r)\%/year$		
Influence of ambient temperature			
• at -10 ... +60 °C (14 ... 140 °F)	$\leq (0.1 \cdot r + 0.2)\%$		
• at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F)	$\leq (0.1 \cdot r + 0.15)\%/10 \text{ K}$		
Measured Value Resolution	-		
	$3 \cdot 10^{-5}$ of nominal measuring range		

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure
(from differential pressure series)

SITRANS P, DS III series for absolute pressure (from differential pressure series)

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Rated operating conditions		
Degree of protection (to EN 60529)	IP65	
Process temperature		
• 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		
- Digital indicators	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Permissible	
• Electromagnetic compatibility		
- Emitted interference and interference immunity	To EN 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 4.5 kg (≈ 9.9 lb)	
Housing material	Poor in copper die-cast aluminium, GD-AISI12 or stainless steel precision casting, mat. No. 1.4408	
Wetted parts materials		
• Seal diaphragm	Stainless steel, mat. No. 1.4404/316L or Hastelloy C276, mat. No. 2.4819, Monel, mat. No. 2.4360, tantalum or gold	
• Process flanges and sealing screw	Stainless steel, mat. No. 1.4408, Hastelloy C4, mat. No. 2.4610 or Monel, mat. No. 2.4360	
• O-Ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR	
Measuring cell filling	Silicone oil or inert filling liquid (max. 160 bar (2320 psi a) with oxygen measurement)	
Process connection	1/4-18 NPT and flange connection to DIN 19213 with mounting thread M10 to DIN 19213 or 7/16-20 UNF to EN 61518	
Material of the mounting bracket		
• Steel	Sheet steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel	Stainless steel, Mat. No. 1.4301 (SS304)	
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	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
• Startup current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure (from differential pressure series)

SITRANS P, DS III series for absolute pressure (from differential pressure series)

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 99 ATEX 2122	
- Identification	Ex II 1/2 G EEx ia/ib IIB/IIC T6	
- 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 maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Identification	Ex II 1/2 G EEx d IIC T4/T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Identification	Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Identification	Ex II 2 D IP65 T 120 °C	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\text{max}} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\text{max}} = 1.2 \text{ W}$
• Type of protection "n" (zone 2)	TÜV 01 ATEX 1696 X	Planned
- Identification	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection to FM	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	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	

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure (from differential pressure series)

HART communication

HART communication	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 measuring value) or 10 (two measuring 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 T_{63} , adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	Can be parameterized (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	Can be parameterized (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

Communication FOUNDATION Fieldbus

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 T_{63} , adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	Can be parameterized (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 FF 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

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure (from differential pressure series)

2

Selection and Ordering data		Order No.	
SITRANS P pressure transmitters for absolute pressure, from the differential pressure, series DS III HART		7 MF 4 3 3 3 -	
Measuring cell filling	Measuring cell cleaning		
Silicone oil	Standard	1	
Inert liquid ¹⁾	Grease-free	3	
Span			
8.3 ... 250 mbar a	(0.12 ... 3.63 psi a)	E)	D
43 ... 1300 mbar a	(0.62 ... 18.9 psi a)	E)	F
0.16 ... 5 bar a	(2.32 ... 72.5 psi a)	E)	G
1 ... 30 bar a	(14.5 ... 435 psi a)		H
5.3 ... 100 bar a	(76.9 ... 1450 psi a)		KE
Wetted parts materials			
Seal diaphragm	Parts of measuring cell		
Stainless steel	Stainless steel		A
Hastelloy	Stainless steel		B
Hastelloy	Hastelloy		C
Tantalum	Tantalum		E
Monel	Monel	E)	H
Gold	Gold		L
Version for diaphragm seal ²⁾³⁾⁴⁾			Y
Process connection			
Female thread 1/4-18 NPT with flange connection			
• Sealing screw opposite process connection			
- Mounting thread 7/16"-20 UNF to EN 61518			2
- Mounting thread M10 to DIN 19213 (only for replacement needs)			0
• Vent on side of process flange ⁵⁾			
- Mounting thread 7/16"-20 UNF to EN 61518			6
- Mounting thread M10 to DIN 19213 (only for replacement needs)			4
Non-wetted parts materials			
Process flange screws	Electronics housing		
Stainless steel	Die-cast aluminium		2
Stainless steel	Stainless steel precision casting ⁶⁾		3
Version			
• Standard version			1
• International version, English label inscriptions, documentation in 5 languages on CD			2
Explosion protection			
• Without			A
• With ATEX, Type of protection:			
- "Intrinsic safety (Ex ia)"			B
- "Explosion-proof (Ex d)" ⁷⁾			D
- "Intrinsic safety and explosion-proof enclosure (Ex ia + Ex d)" ⁸⁾			P
- "Ex nA/nL (zone 2)"			E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" ⁸⁾			R
• With FM + CSA, Type of protection:			
- "Intrinsic safety and explosion-proof (is + xp)" ⁷⁾			NC
Electrical connection / cable entry			
• Screwed gland Pg 13.5 ⁹⁾			A
• Screwed gland M20x1.5			B
• Screwed gland 1/2-14 NPT			C
• Han 7D plug (plastic housing) incl. mating connector ⁹⁾			D
• Plug M12 (metal) ¹⁰⁾			F

Selection and Ordering data		Order No.	
SITRANS P pressure transmitters for absolute pressure, from the differential pressure, series DS III HART		7 MF 4 3 3 3 -	
Display			
• Without indicator			0
• Without visible digital indicator (digital indicator hidden, setting: mA)			1
• With visible digital indicator			6
• With customer-specific digital indicator (setting as specified, Order code "Y21" or required)			7
Power supply units see "SITRANS I power supply units and isolation amplifiers".			
Factory-mounting of shut-off valves and valve manifolds see page 2/142.			
Included in delivery of the device:			
• Brief instructions (Leporello)			
• CD-ROM with detailed documentation			
• Sealing plug(s) or sealing screw(s) for the process flanges(s)			
1) For oxygen applications, add Order code E10.			
2) Version 7MF4333-1DY... only up to max. span 200 mbar a (2.9 psi a).			
3) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.			
4) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.			
5) Not for span "5.3 ... 100 bar a (76.9 ... 1450 psi a)". Position of the top vent valve in the process flange (see dimensional drawing).			
6) Not together with Electrical connection „Screwed gland Pg 13.5" and „Han7D plug".			
7) Without cable gland, with blanking plug			
8) With enclosed cable gland Ex ia and blanking plug			
9) Not together with type of protection "Explosion-proof" and and type of protection "Ex nA".			
10) Not together with types of protection "Explosion-proof" or "Intrinsic safety and explosion-proof"			
E) Combinations of the versions marked with E) are subject to the export regulations AL: 2B230, ECCN: N.			
F) Subject to export regulations AL: 91999, ECCN: N.			

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure
(from differential pressure series)

Selection and Ordering data		Order No.	
SITRANS P pressure transmitters for absolute pressure (from the differential pressure series)			
DS III PA series (PROFIBUS PA)	F)	7 MF 4 3 3 4 -	
DS III FF series (FOUNDATION Fieldbus)	F)	7 MF 4 3 3 5 -	
Measuring cell filling		Measuring cell cleaning	
Silicone oil		Standard	1
Inert liquid ¹⁾		Grease-free	3
Nominal measuring range			
250 mbar a	(3.63 psi a)	E)	D
1300 mbar a	(18.9 psi a)	E)	F
5 bar a	(72.5 psi a)	E)	G
30 bar a	(435 psi a)		H
100 bar a	(1450 psi a)		K E
Wetted parts materials			
Seal diaphragm	Parts of measuring cell		
Stainless steel	Stainless steel		A
Hastelloy	Stainless steel		B
Hastelloy	Hastelloy		C
Tantalum	Tantalum		E
Monel	Monel	E)	H
Gold	Gold		L
Version as diaphragm seal ²⁾³⁾⁴⁾			Y
Process connection			
Female thread 1/4-18 NPT with flange connection			
• Sealing screw opposite process connection			
- Mounting thread $7/16$ -20 UNF to EN 61518			2
- Mounting thread M10 to DIN 19213 (only for replacement needs)			0
• Vent on side of process flange ⁵⁾			
- Mounting thread $7/16$ -20 UNF to EN 61518			6
- Mounting thread M10 to DIN 19213 (only for replacement needs)			4
Non-wetted parts materials			
Process flange screws	Electronics housing		
Stainless steel	Die-cast aluminium		2
Stainless steel	Stainless steel precision casting		3
Version			
• Standard version			
			1
• International version, English label inscriptions, documentation in 5 languages on CD			
			2
Explosion protection			
• Without			
			A
• With ATEX, Type of protection:			
- "Intrinsic safety (Ex ia)"			B
- "Explosion-proof (Ex d)" ⁶⁾			D
- "Intrinsic safety and explosion-proof enclosure (Ex ia + Ex d)" ⁷⁾			P
- "Ex nA/nL (zone 2)"			E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" ⁷⁾ (not for DS III FF)			R
• With FM + CSA, Type of protection:			
- "Intrinsic safety and explosion-proof (is + xp)" ⁶⁾			NC
Electrical connection / cable entry			
• Screwed gland M20x1.5			
			B
• Screwed gland 1/2-14 NPT			
			C
• M12 Connector (metal) ⁸⁾			
			F

Selection and Ordering data		Order No.	
SITRANS P pressure transmitters for absolute pressure (from the differential pressure series)			
DS III PA series (PROFIBUS PA)	F)	7 MF 4 3 3 4 -	
DS III FF series (FOUNDATION Fieldbus)	F)	7 MF 4 3 3 5 -	
Display			
• Without indicator			0
• Without visible digital indicator (digital indicator hidden, setting: mA)			1
• With visible digital indicator			6
• With customer-specific digital indicator (setting as specified, Order code "Y21" or required)			7

Factory-mounting of shut-off valves and valve manifolds see page 2/142.

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- 1) For oxygen application, add Order code E10.
 - 2) Version 7MF4334-1DY... only up to max. span 200 mbar a (2.9 psi a).
 - 3) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
 - 4) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.
 - 5) Not for nominal measuring range 100 bar a (1450 psi a). 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) Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof".
- E) Combinations of the versions marked with E) are subject to the export regulations AL: 2B230, ECCN: N.
- F) Subject to export regulations AL: 9I999, ECCN: N.

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure (from differential pressure series)

2

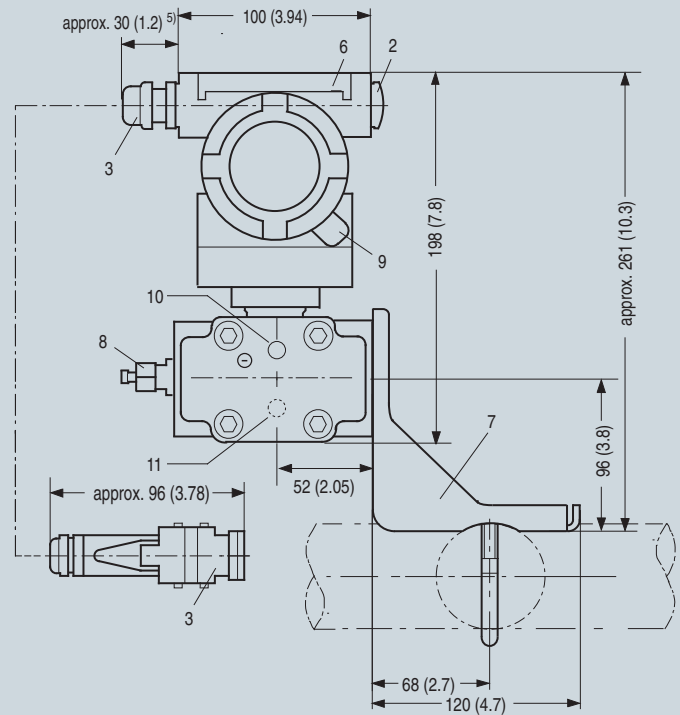
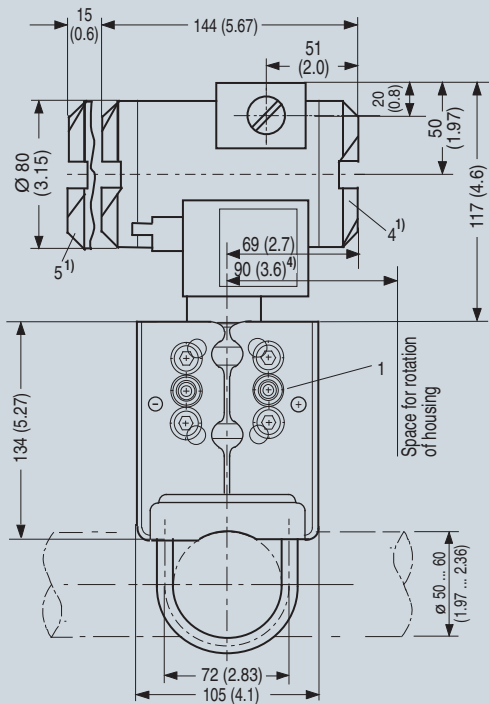
Selection and Ordering data		Order code			Selection and Ordering data		Order code			
<i>Further designs</i>		HART	PA	FF	<i>Further designs</i>		HART	PA	FF	
Add "-Z" to Order No. and specify Order code.					Add "-Z" to Order No. and specify Order code.					
Pressure transmitter with mounting bracket made of:					Explosion-proof "Intrinsic safety" to NEPSI (China)		E55	✓	✓	✓
• Steel	A01	✓	✓	✓	(only for transmitter 7MF4...-.....-B..)					
• Stainless steel	A02	✓	✓	✓	Explosion protection "Explosion-proof" to NEPSI (China)		E56	✓	✓	✓
O-rings for process flanges (instead of FPM (Viton))					(only for transmitter 7MF4...-.....-D..)					
• PTFE (Teflon)	A20	✓	✓	✓	Explosion-proof "Zone 2" to NEPSI (China)		E57	✓	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	✓	(only for transmitter 7MF4...-.....-E..)					
• FFPM (Kalrez, compound 4079)	A22	✓	✓	✓	Interchanging of process connection side		H01	✓	✓	✓
• NBR (Buna N)	A23	✓	✓	✓	Vent on side for gas measurements		H02	✓	✓	✓
Plug					Process flange					
• Han 7D (metal, gray)	A30	✓			• Hastelloy	K01	✓	✓	✓	
• Han 8U (instead of Han 7D)	A31	✓			• Monel	K02	✓	✓	✓	
Sealing screws		A40	✓	✓	✓	• Stainless steel with PVDF insert	K04	✓	✓	✓
¼-18 NPT, with valve in material of process flanges					max. PN 10 (MWP 145 psi), max. temperature of medium 90 °C (194 °F)					
Cable sockets for M12 connectors (metal)		A50	✓	✓	✓	For ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible				
Rating plate inscription (instead of German)					<i>Additional data</i>					
• English	B11	✓	✓	✓	Add "-Z" to Order No. and specify Order code.					
• French	B12	✓	✓	✓	Measuring range to be set		Y01	✓		
• Spanish	B13	✓	✓	✓	Specify in plain text (max. 5 digits): Y01: up to ... mbar, bar, kPa, MPa, psi					
• Italian	B14	✓	✓	✓	Measuring point number (TAG No.)		Y15	✓	✓	
English rating plate		B21	✓	✓	✓	Max. 16 characters, specify in plain text: Y15:				
Pressure units in inH ₂ O or psi					Measuring point text		Y16	✓	✓	
Quality inspection certificate (Factory calibration) to IEC 60770-2¹⁾		C11	✓	✓	✓	Max. 27 characters, specify in plain text: Y16:				
Acceptance test certificate²⁾		C12	✓	✓	✓	Entry of HART address (TAG)		Y17	✓	
To EN 10204-3.1					Max. 8 characters, specify in plain text: Y17:					
Factory certificate		C14	✓	✓	✓	Setting of pressure indication in pressure units		Y21	✓	
To EN 10204-2.2					Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ...					
"Functional Safety (SIL)" certificate		C20	✓			Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ¹⁾ , inH ₂ O ¹⁾ , ftH ₂ O ¹⁾ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM oder %) ref. temperature 20 °C				
"PROFIsafe" certificate and protocol		C21		✓		Setting of pressure indication in non-pressure units		Y22 + Y01	✓	
Setting of upper limit of output signal to 22.0 mA		D05	✓			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)				
Manufacturer's declaration acc. to NACE (only together with seal diaphragm made of Hastelloy and stainless steel)		D07	✓	✓	✓	Preset bus address		Y25	✓	
Type of protection IP68 (not together with Han 7D/Han 8U plug, cable gland PG 13.5)		D12	✓	✓	✓	(possible between 1 and 126) Specify in plain text: Y25:				
Digital indicator alongside the input keys (only together with the devices 7MF4333-.....-A.6 or -.A.7-Z, Y21 or Y22 + Y01)		D27	✓	✓	✓	Only "Y01", "Y21", "Y22", "Y25" and "D05" can be factory preset ✓ = available				
Supplied with oval flange (1 item), PTFE packing and stainless steel screws in thread of process flange		D37 ^{F)}	✓	✓	✓	1) When the manufacture's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here.				
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")		E01	✓	✓	✓	2) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.				
Use on zone 0 (only together with type of protection "Intrinsic safety (EEx ia)")		E02	✓	✓	✓	F) Subject to export regulations AL: 91999, ECCN: N.				
Oxygen application (max. 120 bar a (1740 psi a) at 60°C (140 °F) with oxygen measurement and inert liquid)		E10	✓	✓	✓					
Explosion-proof "Intrinsic safety" to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..)		E25	✓	✓	✓					

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure
(from differential pressure series)

Dimensional drawings



- 1 Process connection: 1/4-18 NPT (EN 61518)
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland Pg 13,5 (adapter)^{2) 3)},
 - screwed gland M20x1,5³⁾,
 - screwed gland 1/2-14 NPT or
 - Han 7D/ Han 8U plug^{2) 3)}
- 4 Terminal side
- 5 Electronics side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Sealing screw with valve (option)
- 9 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
- 10 Lateral venting for liquid measurement (Standard)
- 11 Lateral venting for gas measurement (suffix H02)

- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA [is + xp]"
- 4) 92 mm (3.62 inch) for minimum distance to permit rotation with indicator
- 5) 45 mm (1.8 inch) for Pg 13,5 with adapter

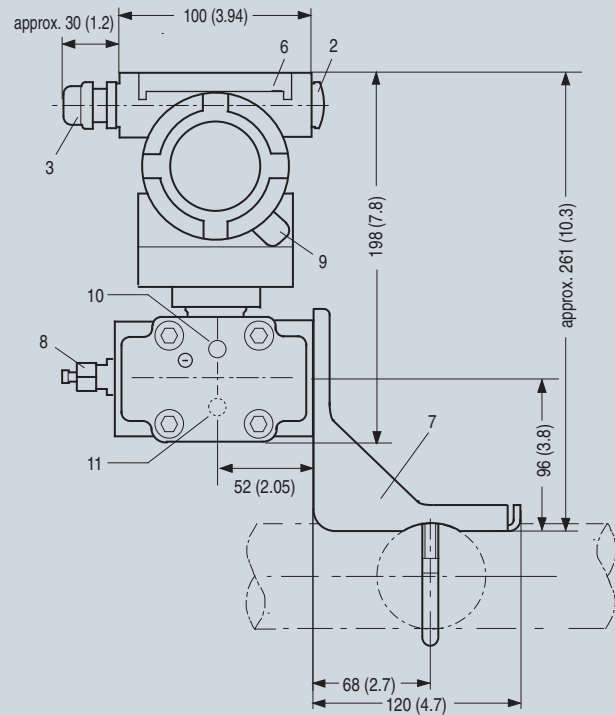
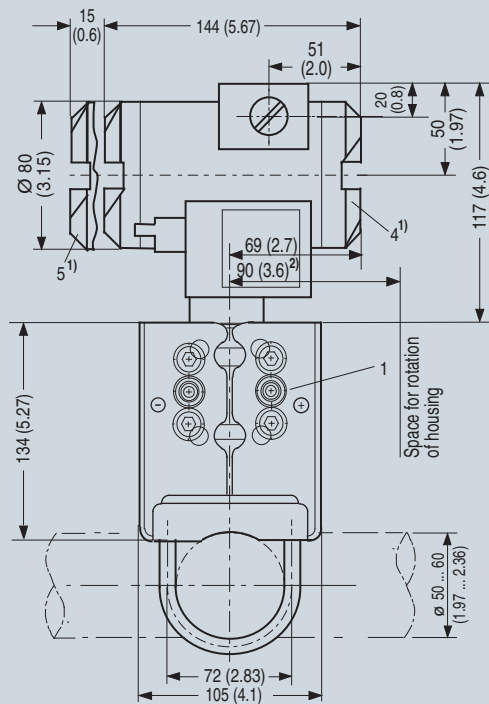
SITRANS P pressure transmitters, DS III HART series for absolute pressure, from the differential pressure series, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

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

DS III series for absolute pressure
(from differential pressure series)

2



- 1 Process connection: 1/4-18 NPT (EN 61518)
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland M20x1,5⁴⁾,
 - screwed gland 1/2-14 NPT or
 - PROFIBUS plug M12³⁾⁴⁾
- 4 Terminal side
- 5 Electronic side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Sealing screw with valve (option)
- 9 Screw cover – safety bracket (only for explosion-proof enclosure, not shown in the drawing)
- 10 Lateral venting for liquid measurement (Standard)
- 11 Lateral venting for gas measurement (suffix H02)

- 1) Allow approx. 20 mm (0.79 inch) thread length in addition
- 2) 92 mm (3.62 inch) for minimum distance to permit rotation with indicator
- 3) Not with type of protection "explosion-proof enclosure"
- 4) Not with type of protection "FM + CSA"

SITRANS P pressure transmitters, DS III PA and FF series for absolute pressure, from the differential pressure series, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

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

DS III series
for differential pressure and flow

Technical specifications

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

	HART		PROFIBUS PA or FOUNDATION Fieldbus	
Input	Differential pressure and flow			
Measured variable	Span			
Spans (infinitely adjustable) or nominal measuring range and max. permissible working pressure	1 ... 20 mbar (0.4015 ... 8.031 inH ₂ O)	Maximum working pressure 32 bar (464 psi)	Nominal measuring range 20 mbar g (8.031 inH ₂ O)	Maximum working pressure 32 bar (464 psi)
	1 ... 60 mbar (0.4015 ... 24.09 inH ₂ O)	160 bar (2320 psi)	60 mbar (24.09 inH ₂ O)	160 bar (2320 psi)
	2.5 ... 250 mbar (1.004 ... 100.4 inH ₂ O)		250 mbar (100.4 inH ₂ O)	
	6 ... 600 mbar (2.409 ... 240.9 inH ₂ O)		600 mbar (240.9 inH ₂ O)	
	16 ... 1600 mbar (6.424 ... 642.4 inH ₂ O)		1600 mbar (642.4 inH ₂ O)	
	50 ... 5000 mbar (20.08 ... 2008 inH ₂ O)		5 bar (2008 inH ₂ O)	
	0.3 ... 30 bar (4.35 ... 435 psi)		30 bar (435 psi)	
	2.5 ... 250 mbar (1.004 ... 100.4 inH ₂ O)	420 bar (6091 psi)	250 mbar (100.4 inH ₂ O)	420 bar (6091 psi)
	6 ... 600 mbar (2.409 ... 240.9 inH ₂ O)		600 mbar (240.9 inH ₂ O)	
	16 ... 1600 mbar (6.424 ... 642.4 inH ₂ O)		1600 mbar (642.4 inH ₂ O)	
	50 ... 5000 mbar (20.08 ... 2008 inH ₂ O)		5 bar (2008 inH ₂ O)	
	0.3 ... 30 bar (4.35 ... 435 psi)		30 bar (435 psi)	
Lower measuring limit	-100% of max. span (-33% with 30 bar (435 psi) measuring cell or 30 mbar a (0.44 psi))			
Upper measuring limit	100% of max. span (for oxygen version and inert filling liquid; max. 160 bar g (2320 psi g))			
Output	4 ... 20 mA		Digital PROFIBUS PA or FOUNDATION Fieldbus signal	
Output signal	3.55 mA, factory preset to 3.84 mA		-	
• Lower limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
• Upper limit (infinitely adjustable)				
Load				
• Without HART communication	$R_B \leq (U_H - 10.5 \text{ V}) / 0.023 \text{ A}$ in Ω , U_H : Power supply in V		-	
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
With polarity reversal protection	-		Yes	
Accuracy	To EN 60770-1			
Reference conditions (All error data refer always refer to the set span)	Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature 25 °C (77 °F) r: Span ratio (r = max. span / set span)			
Error in measurement and fixed-point setting (including hysteresis and repeatability)				
• Linear characteristic			≤ 0,075%	
- r ≤ 10	≤ (0.0029 · r + 0.071)%			
- 10 < r ≤ 30	≤ (0.0045 · r + 0.071)%			
- 30 < r ≤ 100	≤ (0.005 · r + 0.05)%			
• Square-root characteristic (flow > 50%)			≤ 0,1%	
- r ≤ 10	≤ 0,1%			
- 10 < r ≤ 30	≤ 0,2%			

SITRANS P measuring instruments for pressure

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

DS III series for differential pressure and flow

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

	HART	PROFIBUS PA or FOUNDATION Fieldbus
<ul style="list-style-type: none"> • Square-root characteristic (flow 25 ... 50%) <ul style="list-style-type: none"> - $r \leq 10$ - $10 < r \leq 30$ 	$\leq 0,2\%$ $\leq 0,4\%$	$\leq 0,2$ - -
Long-term drift (temperature change ± 30 °C (± 54 °F))	$\leq (0,25 \cdot r)\%$ every 5 years static pressure max. 70 bar g (1015 psi g)	$\leq (0,25\%$ every 5 years static pressure max. 70 bar g (1015 psi g)
<ul style="list-style-type: none"> • 20 mbar (0.29 psi)-measuring cell Influence of ambient temperature	$\leq (0,2 \cdot r)$ per year	$\leq 0,2$ per year
<ul style="list-style-type: none"> • at -10 ... +60 °C (14 ... 140 °F) • at -40 ... -10 °C and +60 ... +85 °C (-40 ... +14 °F and 140 ... 185 °F) 	$\leq (0,08 \cdot r + 0,1)\%$ $\leq (0,1 \cdot r + 0,15)\%/10$ K (Twice the value with 20-mbar (0.29 psi) measuring cell)	$\leq 0,3\%$ $\leq 0,25\%/10$ K
Influence of static pressure		
<ul style="list-style-type: none"> • on the zero point <ul style="list-style-type: none"> - 20 mbar (0.29 psi)-measuring cell • on the span <ul style="list-style-type: none"> - 20 mbar (0.29 psi)-measuring cell 	$\leq (0,15 \cdot r)\%$ per 100 bar (1450 psi) $\leq (0,15 \cdot r)\%$ per 32 bar (464 psi) $\leq 0,2\%$ je 100 bar (1450 psi) $\leq 0,2\%$ je 32 bar (464 psi)	$\leq 0,15\%$ je 100 bar (1450 psi) $\leq 0,15\%$ je 32 bar (464 psi) - -
Measured Value Resolution	-	$3 \cdot 10^{-5}$ of nominal measuring range
Rated operating conditions		
Degree of protection (to EN 60529)	IP65	
Process temperature		
<ul style="list-style-type: none"> • Measuring cell with silicone oil filling • Measuring cell with inert filling liquid • In conjunction with dust explosion protection 	-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
<ul style="list-style-type: none"> • Ambient temperature <ul style="list-style-type: none"> - Digital indicators • Storage temperature • Climatic class <ul style="list-style-type: none"> - Condensation • Electromagnetic compatibility <ul style="list-style-type: none"> - Emitted interference and interference immunity 	-30 ... +85 °C (-22 ... +185 °F) -50 ... +85 °C (-58 ... +185 °F) Permissible To EN 61326 and NAMUR NE 21	
Material of the mounting bracket		
<ul style="list-style-type: none"> • Steel • Stainless steel 	Sheet steel, Mat. No. 1.0330, chrome-plated Stainless steel, Mat. No. 1.4301 (SS304)	
Design		
Weight (without options)	$\approx 4,5$ kg ($\approx 9,9$ lb)	
Housing material	Poor in copper die-cast aluminium, GD-AlSi12 or stainless steel precision casting, mat. No. 1.4408	
Wetted parts materials		
<ul style="list-style-type: none"> • Seal diaphragm 	Stainless steel, mat. No. 1.4404/316L or Hastelloy C276, mat. No. 2.4819, Monel, mat. No. 2.4360, tantalum or gold	
Measuring cell filling	Silicone oil or inert filling liquid (max. 160 bar (2320 psi g) with oxygen measurement)	
Process connection	Female thread $\frac{1}{4}$ -18 NPT and flange connection with mounting thread M10 to DIN 19213 or $\frac{7}{16}$ -20 UNF to EN 61518	

SITRANS P measuring instruments for pressure

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

DS III series
for differential pressure and flow

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

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Power supply U_H		Supplied through bus
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
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
• Startup current \leq basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) avail.	-	Yes

SITRANS P measuring instruments for pressure

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

DS III series for differential pressure and flow

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

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)		
PN 32/160 (MWP 464/2320 psi)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
PN 420 (MWP 6092 psi)	For gases of fluid group 1 and liquids of fluid group 1; complies with basic safety requirements of Article 3, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord.	
Explosion protection		
• Intrinsic safety "i"	PTB 99 ATEX 2122	
- Identification	Ex II 1/2 G EEx ia/ib IIB/IIC T6	
- 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 maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Identification	Ex II 1/2 G EEx d IIC T4/T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Identification	Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Identification	Ex II 2 D IP65 T 120 °C	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$
• Type of protection "n" (zone 2)	TÜV 01 ATEX 1696 X	Planned
- Identification	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection to FM	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	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	

SITRANS P measuring instruments for pressure

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

DS III series
for differential pressure and flow

HART communication

HART communication	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 measuring value) or 10 (two measuring 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 T_{63} , adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	Can be parameterized (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	Can be parameterized (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

Communication FOUNDATION Fieldbus

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 T_{63} , adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	Can be parameterized (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 FF 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

SITRANS P measuring instruments for pressure

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

DS III series for differential pressure and flow

2

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for differential pressure and flow, Series DS III HART PN 32/160 (MWP 464/2320 psi)		7 MF 4 4 3 3 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	▶ 1
Inert liquid ¹⁾	Grease-free	▶ 3
Span		
PN 32 (MWP 464 psi)		
1 ... 20 mbar ²⁾	(0.4015 ... 8.03 inH ₂ O)	▶ B
PN 160 (MWP 2320 psi)		
1 ... 60 mbar	(0.4015 ... 24.09 inH ₂ O)	▶ C
2.5 ... 250 mbar	(1.004 ... 100.4 inH ₂ O)	▶ D
6 ... 600 mbar	(2.409 ... 240.9 inH ₂ O)	▶ E
16 ... 1600 mbar	(6.424 ... 642.4 inH ₂ O)	▶ F
50 ... 5000 mbar	(20.08 ... 2008 inH ₂ O)	▶ 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
Tantalum ³⁾	Tantalum	E
Monel ³⁾	Monel	H
Gold ³⁾	Gold	L
Version for diaphragm seal ⁴⁾ 5)		Y
Process connection		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread 7/16-20 UNF to EN 61518		▶ 2
- Mounting thread M10 to DIN 19213 (only for replacement needs)		▶ 0
• Vent on side of process flange ²⁾		
- Mounting thread 7/16-20 UNF to EN 61518		▶ 6
- Mounting thread M10 to DIN 19213 (only for replacement needs)		▶ 4
Non-wetted parts materials		
Process flange screws	Electronics housing	
Stainless steel	Die-cast aluminium	▶ 2
Stainless steel	Stainless steel precision casting ⁶⁾	▶ 3
Version		
• Standard version		▶ 1
• International version, English label inscriptions, documentation in 5 languages on CD		▶ 2
Explosion protection		
• Without		▶ A
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		▶ B
- "Explosion-proof (EEx d)" ⁷⁾		▶ D
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ⁸⁾		▶ P
- "Ex nA/nL (zone 2)"		▶ E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ⁸⁾		▶ R
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)" ⁷⁾		▶ NC
Electrical connection / cable entry		
• Screwed gland Pg 13.5 ⁹⁾		▶ A
• Screwed gland M20x1.5		▶ B
• Screwed gland 1/2-14 NPT		▶ C
• Han 7D plug (plastic housing) incl. mating connector ¹⁰⁾		▶ D
• M12 connectors (metal) ¹⁰⁾		▶ F

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for differential pressure and flow, Series DS III HART PN 32/160 (MWP 464/2320 psi)		7 MF 4 4 3 3 -
Display		
• Without indicator		▶ 0
• Without visible digital indicator (digital indicator hidden, setting: mA)		▶ 1
• With visible digital indication		▶ 6
• With customer-specific digital indication (setting as specified, Order code "Y21" or required)		▶ 7
▶ Available ex stock		
Power supply units see "SITRANS I power supply units and isolation amplifiers".		
Factory-mounting of shut-off valves and valve manifolds see page 2/142.		
Included in delivery of the device:		
• Brief instructions (Leporello)		
• CD-ROM with detailed documentation		
• Sealing plug(s) or sealing screw(s) for the process flanges(s)		
1) For oxygen application, add Order code E10.		
2) Not suitable for connection of remote seal. Position of the top vent valve in the process flanges (see dimensional drawing).		
3) Only together with max. spans 250, 1600, 5000 and 30000 mbar (100.4, 240.9, 2008 inH ₂ O and 435 psi)		
4) When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.		
5) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.		
6) Not together with Electrical connection „Screwed gland Pg 13.5“ and „Han7D plug“.		
7) Without cable gland, with blanking plug		
8) With enclosed cable gland EEx ia and blanking plug		
9) Not together with type of protection "Explosion-proof" and type of protection "Ex nA".		
10) Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof"		

SITRANS P measuring instruments for pressure

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

DS III series
 for differential pressure and flow

Selection and Ordering data		Order No.	Selection and Ordering data		Order No.
SITRANS P pressure transmitters for differential pressure and flow PN 32/160 (MWP 464/2320 psi)			SITRANS P pressure transmitters for differential pressure and flow PN 32/160 (MWP 464/2320 psi)		
DS III PA series (PROFIBUS PA)		7 MF 4 4 3 4 -	DS III PA series (PROFIBUS PA)		7 MF 4 4 3 4 -
DS III FF series (FOUNDATION Fieldbus)		7 MF 4 4 3 5 -	DS III FF series (FOUNDATION Fieldbus)		7 MF 4 4 3 5 -
Measuring cell filling			Electrical connection / cable entry		
Silicone oil	Standard	1	• Screwed gland M20x1.5	B	
Inert liquid ¹⁾	Grease-free	3	• Screwed gland ½-14 NPT	C	
			• M12 connectors (metal) ⁸⁾	F	
Nominal measuring range			Display		
PN 32 (MWP 464 psi)			• Without indicator	0	
20 mbar ²⁾	(8.03 inH ₂ O)	B	• Without visible digital indicator (digital indicator hidden, setting: mA)	1	
PN 160 (MWP 2320 psi)			• With visible digital indication	6	
60 mbar	(24.09 inH ₂ O)	C	• With customer-specific digital indication (setting as specified, Order code "Y21" or required)	7	
250 mbar	(100.4 inH ₂ O)	D			
600 mbar	(240.9 inH ₂ O)	E			
1600 mbar	(642.4 inH ₂ O)	F			
5 bar	(2008 inH ₂ O)	G			
30 bar	(435 psi)	H			
Wetted parts materials			Factory-mounting of shut-off valves and valve manifolds see page 2/142.		
(stainless steel process flanges)			Included in delivery of the device:		
Seal diaphragm	Parts of measuring cell		• Brief instructions (Leporello)		
Stainless steel	Stainless steel	A	• CD-ROM with detailed documentation		
Hastelloy	Stainless steel	B	• Sealing plug(s) or sealing screw(s) for the process flanges(s)		
Hastelloy	Hastelloy	C			
Tantalum ³⁾	Tantalum	E			
Monel ³⁾	Monel	H			
Gold ³⁾	Gold	L			
Version as diaphragm seal ^{4) 5)}		Y			
Process connection			2/142.		
Female thread ¼-18 NPT with flange connection			When the manufacturer's certificate M (calibration certificate) has to be ordered for transmitters with diaphragm seals, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.		
• Sealing screw opposite process connection			5) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.		
- Mounting thread 7/16-20 UNF to EN 61518		2	6) Without cable gland, with blanking plug.		
- Mounting thread M10 to DIN 19213 (only for replacement needs)		0	7) With enclosed cable gland EEx ia and blanking plug.		
• Venting on side of process flanges ²⁾			8) Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof".		
- Mounting thread 7/16-20 UNF to EN 61518		6			
- Mounting thread M10 to DIN 19213 (only for replacement needs)		4			
Non-wetted parts materials					
Process flange screws	Electronics housing				
Stainless steel	Die-cast aluminium	2			
Stainless steel	Stainless steel precision casting	3			
Version					
• Standard version		1			
• International version, English label inscriptions, documentation in 5 languages on CD		2			
Explosion protection					
• Without		A			
• With ATEX, Type of protection:					
- "Intrinsic safety (EEx ia)"		B			
- "Explosion-proof (EEx d) ⁶⁾		D			
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d) ⁷⁾		P			
- "n (Zone 2)" (planned)		E			
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D) ⁷⁾ (not for DS III FF)		R			
• With FM + CSA, Type of protection:					
- "Intrinsic safety and explosion-proof (is + xp) ⁶⁾		NC			

SITRANS P measuring instruments for pressure

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

DS III series for differential pressure and flow

2

Selection and Ordering data	Order code		
<i>Further designs</i> Add "-Z" to Order No. and specify Order code.	HART	PA	FF
Pressure transmitter with mounting bracket made of:			
• Steel	A01	✓	✓
• Stainless steel	A02	✓	✓
O-rings for process flanges (instead of FPM (Viton))			
• PTFE (Teflon)	A20	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓
• FFKM (Kalrez, compound 4079)	A22	✓	✓
• NBR (Buna N)	A23	✓	✓
Plug			
• Han 7D (metal, gray)	A30	✓	
• Han 8U (instead of Han 7D)	A31	✓	
	A40	✓	✓
Sealing screws ¼-18 NPT, with valve in mat. of process flanges			
Cable sockets for M12 connectors (metal)	A50	✓	✓
Rating plate inscription (instead of German)			
• English	B11	✓	✓
• French	B12	✓	✓
• Spanish	B13	✓	✓
• Italian	B14	✓	✓
English rating plate (calibration certificate)	B21	✓	✓
Pressure units in inH ₂ O or psi			
Quality inspection certificate (Factory calibration) to IEC 60770-2¹⁾	C11	✓	✓
Acceptance test certificate²⁾ To EN 10 204-3.1	C12	✓	✓
Factory certificate To EN 10 204-2.2	C14	✓	✓
"Functional Safety (SIL)" certificate	C20	✓	
"PROFIsafe" certificate and protocol	C21		✓
Setting of upper limit of output signal to 22.0 mA	D05	✓	
Manufacturer's declaration acc. to NACE (only together with seal diaphragm made of Hastelloy and stainless steel)	D07	✓	✓
Type of protection IP68 (not together with 7D/ Han 8U plug, cable gland Pg 13.5)	D12	✓	✓
Digital indicator alongside the input keys (only together with the devices 7MF4433-...-2-.A.6 or -.A.7-Z, Y21 or Y22 + Y01)	D27	✓	✓
Process flange screws made of Monel (max. nominal pressure PN20)	D34	✓	✓
	D37	✓	✓
Supplied with oval flange set (2 items), PTFE packings and stainless steel screws in thread of process flanges	D37	✓	✓
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	E01	✓	✓
Use on zone 0 (only together with type of protection "Intrinsic safety (EEx ia)")	E02	✓	✓
TÜV approval to AD/TRD (only together with type of protection "Intrinsic safety (EEx ia)")	E06	✓	
Overfilling safety device for flammable and non-flammable liquids (max. PN 32 (MVWP 464 psi), basic device with type of protection "Intrinsic safety (EEx ia)", to WHG and VbF, not together with measuring cell filling "inert liquid")	E08	✓	✓

Selection and Ordering data	Order code		
<i>Further designs</i> Add "-Z" to Order No. and specify Order code.	HART	PA	FF
Oxygen application (max. 120 bar (1740 psi) at 60°C (140 °F) with oxygen measurement and inert liquid)	E10	✓	✓
Explosion-proof "Intrinsic safety" to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..)	E25	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)	E55	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)	E56	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)	E57	✓	✓
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 ³⁾)	H03	✓	✓
Process flange			
• Hastelloy	K01	✓	✓
• Monel	K02	✓	✓
• Stainless steel with PVDF insert max. PN 10 (MWP 145 psi), max. temperature of medium 90 °C (194 °F)	K04	✓	✓
For ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible			

✓ = available

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

2) When the acceptance test certificate 3.1 for transmitters with direct-connected diaphragm seals is ordered, this certificate must also be ordered with the corresponding seals.

3) Not suitable for connection of remote seal

SITRANS P measuring instruments for pressure

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

DS III series
for differential pressure and flow

2

Selection and Ordering data	Order code		
Additional data	HART	PA	FF
Add "-Z" to Order No. and specify Order code.			
Measuring range to be set Specify in plain text:			
• With linear characteristic (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓	
• With square-rooted characteristic (max. 5 digits): Y02: ... up to ... mbar, bar, kPa, MPa, psi	Y02	✓	
Measuring point number (TAG No.) Max. 16 char., specify in plain text: Y15:	Y15	✓	✓
Measuring point text 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: mA): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ¹⁾ , inH ₂ O ¹⁾ , ftH ₂ O ¹⁾ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM oder %) ref. temperature 20 °C	Y21	✓	✓
Setting of pressure indicator in non-pressure units 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)	Y22 ¹⁾ + Y01 or Y02	✓	
Preset bus address (possible between 1 and 126) Specify in plain text: Y25:	Y25		✓

Only "Y01", "Y21", "Y22", "Y25" and "D05" can be factory preset

✓ = available

¹⁾ Not together with over-filling safety device for flammable and non-flammable liquids (Order code "E08")

SITRANS P measuring instruments for pressure

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

DS III series for differential pressure and flow

2

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for differential pressure and flow, Series DS III HART PN 420 (MWP 6092 psi)		7 MF 4 5 3 3 -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	Standard	1
Span		
2.5 ... 250 mbar	(1.004 ... 100.4 inH ₂ O)	D
6 ... 600 mbar	(2.409 ... 240.9 inH ₂ O)	E
16 ... 1600 mbar	(6.424 ... 642.4 inH ₂ O)	F
50 ... 5000 mbar	(20.08 ... 2008 inH ₂ O)	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
Gold ¹⁾	Gold	L
Process connection		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread 7/16-20 UNF to EN 61518		3
- Mounting thread M12 to DIN 19213 (only for replacement needs)		1
• Venting on side of process flanges. Position of the top vent valve in the process flanges (see dimensional drawing).		
- Mounting thread 7/16-20 UNF to EN 61518		7
- Mounting thread M12 to DIN 19213 (only for replacement needs)		5
Non-wetted parts materials		
Process flange screws	Electronics housing	
Stainless steel	Die-cast aluminium	2
Stainless steel	Stainless steel precision casting ²⁾	3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		B
- "Explosion-proof (EEx d) ³⁾		D
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d) ⁴⁾		P
- "Ex nA/nL (zone 2)"		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D) ⁴⁾		R
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp) ³⁾ , max PN 360		NC
Electrical connection / cable entry		
• Screwed gland Pg 13.5 ⁵⁾		A
• Screwed gland M20x1.5		B
• Screwed gland 1/2-14 NPT		C
• Han 7D plug (plastic housing) incl. mating connector ⁵⁾		D
• M12 connectors (metal) ⁶⁾		F

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for differential pressure and flow, Series DS III HART PN 420 (MWP 6092 psi)		7 MF 4 5 3 3 -
Display		
• Without indicator		0
• Without visible digital indicator (digital indicator hidden, setting: mA)		1
• With visible digital indication		6
• With customer-specific digital indication (setting as specified, Order code "Y21" or required)		7

Power supply units see "SITRANS I power supply units and isolation amplifiers".

Factory-mounting of shut-off valves and valve manifolds see page 2/142.

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

- 1) Not together with max. span 600 mbar (240.9 inH₂O)
- 2) Not together with Electrical connection „Screwed gland Pg 13.5" and „Han7D plug".
- 3) Without cable gland, with blanking plug
- 4) With enclosed cable gland EEx ia and blanking plug
- 5) Not together with type of protection "Explosion-proof" and and type of protection "Ex nA".
- 6) Cannot be used together with the following types of protection: "Explosion-proof" and "Intrinsic safety and explosion-proof".

SITRANS P measuring instruments for pressure

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

DS III series
for differential pressure and flow

Selection and Ordering data	Order No.	Selection and Ordering data	Order No.
SITRANS P pressure transmitters for differential pressure and flow, Series DS III HART PN 420 (MWP 6092 psi)		SITRANS P pressure transmitters for differential pressure and flow, Series DS III HART PN 420 (MWP 6092 psi)	
DS III PA (PROFIBUS PA) series	7 MF 4 5 3 4 -	DS III PA (PROFIBUS PA) series	7 MF 4 5 3 4 -
DS III FF series (FOUNDATION Fieldbus)	7 MF 4 5 3 5 -	DS III FF series (FOUNDATION Fieldbus)	7 MF 4 5 3 5 -
	1 ■■■■ - ■■■■		1 ■■■■ - ■■■■
Nominal measuring range		Display	
250 mbar (100.4 inH ₂ O)	D	• Without indicator	0
600 mbar (240.9 inH ₂ O)	E	• Without visible digital indicator (digital indicator hidden, setting: mA)	1
1600 mbar (642.4 inH ₂ O)	F	• With visible digital indicator	6
5 bar (2008 inH ₂ O)	G	• With customer-specific digital indicator (setting as specified, Order code "Y21" or required)	7
30 bar (435 psi)	H		
Wetted parts materials		Factory-mounting of shut-off valves and valve manifolds see page 2/142.	
(stainless steel process flanges)		Included in delivery of the device:	
Seal diaphragm Parts of measuring cell		• Brief instructions (Leporello)	
Stainless steel Stainless steel	A	• CD-ROM with detailed documentation	
Hastelloy Stainless steel	B	• Sealing plug(s) or sealing screw(s) for the process flanges(s)	
Gold ¹⁾ Gold	L		
Process connection		1) Not together with max. span 600 mbar (240.9 inH ₂ O)	
Female thread 1/4-18 NPT with flange connection		2) Without cable gland, with blanking plug.	
• Sealing screw opposite process connection		3) With enclosed cable gland EEx ia and blanking plug.	
- Mounting thread 7/16-20 UNF to EN 61518	3	4) Not together with types of protection "Explosion-proof" and "Intrinsic safety and explosion-proof"	
- Mounting thread M12 to DIN 19213 (only for replacement needs)	1		
• Venting on side of process flanges. Position of the top vent valve in the process flanges (see dimensional drawing).			
- Mounting thread 7/16-20 UNF to EN 61518	7		
- Mounting thread M12 to DIN 19213 (only for replacement needs)	5		
Non-wetted parts materials			
Process flange screws Electronics housing			
Stainless steel Die-cast aluminium	2		
Stainless steel Stainless steel precision casting	3		
Version			
• Standard version	1		
• International version, English label inscriptions, documentation in 5 languages on CD	2		
Explosion protection			
• Without	A		
• With ATEX, Type of protection:			
- "Intrinsic safety (EEx ia)" ²⁾	B		
- "Explosion-proof (EEx d)" ²⁾	D		
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ³⁾	P		
- "Ex nA/nL (zone 2)"	E		
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ³⁾ (not for DS III FF)	R		
• With FM + CSA, Type of protection:			
- "Intrinsic safety and explosion-proof (is + xp)" ²⁾ , max PN 360	NC		
Electrical connection / cable entry			
• Screwed gland M20x1.5	B		
• Screwed gland 1/2-14 NPT	C		
• Plug M12 incl. mating connector ⁴⁾	F		

SITRANS P measuring instruments for pressure

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

DS III series for differential pressure and flow

2

Selection and Ordering data	Order code		
<i>Further designs</i>	HART	PA	FF
Add "-Z" to Order No. and specify Order code.			
Pressure transmitter with mounting bracket made of:			
• Steel	A01	✓	✓
• Stainless steel	A02	✓	✓
O-rings for process flanges (instead of FPM (Viton))			
• PTFE (Teflon)	A20	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓
• FFFM (Kalrez, compound 4079)	A22	✓	✓
• NBR (Buna N)	A23	✓	✓
Plug			
• Han 7D (metal, gray)	A30	✓	
• Han 8U (instead of Han 7D)	A31	✓	
Sealing screws	A40	✓	✓
¼-18 NPT, with valve in material of process flanges			
Cable sockets for M12 connectors (metal)	A50	✓	✓
Rating plate inscription (instead of German)			
• English	B11	✓	✓
• French	B12	✓	✓
• Spanish	B13	✓	✓
• Italian	B14	✓	✓
English rating plate Pressure units in inH ₂ O or psi	B21	✓	✓
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11	✓	✓
Acceptance test certificate To EN 10204-3.1	C12	✓	✓
Factory certificate To EN 10204-2.2	C14	✓	✓
"Functional Safety (SIL)" certificate	C20	✓	
"PROFIsafe" certificate and protocol	C21	✓	
Setting of upper limit of output signal to 22.0 mA	D05	✓	
Manufacturer's declaration acc. to NACE (only together with seal diaphragm made of Hastelloy and stainless steel)	D07	✓	✓
Type of protection IP68 (not together with Han 7D / Han 8U plug, Pg 13.5 screwed gland)	D12	✓	✓
Digital indicator alongside the input keys (only together with the devices 7MF4533-...-2-.A.6 or -.A.7-Z, Y21 or Y22 + Y01)	D27	✓	✓
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	E01	✓	✓
Use on zone 0 (only together with type of protection "Intrinsic safety (EEx ia)")	E02	✓	✓
Explosion-proof "Intrinsic safety" to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..)	E25	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)	E55	✓	✓

Selection and Ordering data	Order code		
<i>Further designs</i>	HART	PA	FF
Add "-Z" to Order No. and specify Order code.			
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)	E56	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)	E57	✓	✓
Interchanging of process connection side	H01	✓	✓
Stainless steel process flanges for vertical differential pressure lines	H03	✓	✓
Additional data			
Add "-Z" to Order No. and specify Order code.			
Measuring range to be set Specify in plain text:			
• With linear characteristic (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi	Y01	✓	
• With square-rooted characteristic (max. 5 digits): Y02: ... up to ... mbar, bar, kPa, MPa, psi	Y02	✓	
Measuring point number (TAG No.) Max. 16 characters, specify in plain text: Y15:	Y15	✓	✓
Measuring point text 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: mA): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ¹ , inH ₂ O ¹ , ftH ₂ O ¹ , 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 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)	Y22 + Y01 or Y02	✓	
Preset bus address (possible between 1 and 126) Specify in plain text: Y25:	Y25		✓

Only "Y01", "Y21", "Y22", "Y25" and "D05" can be factory preset

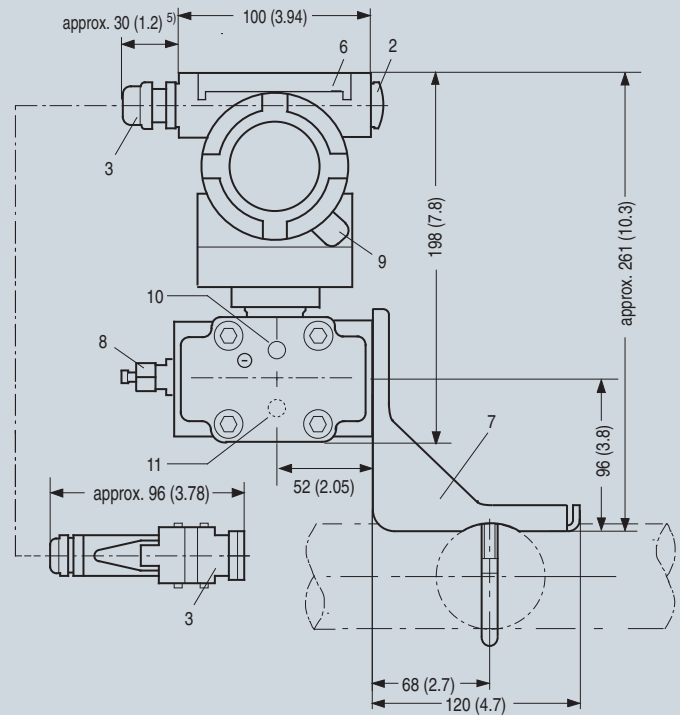
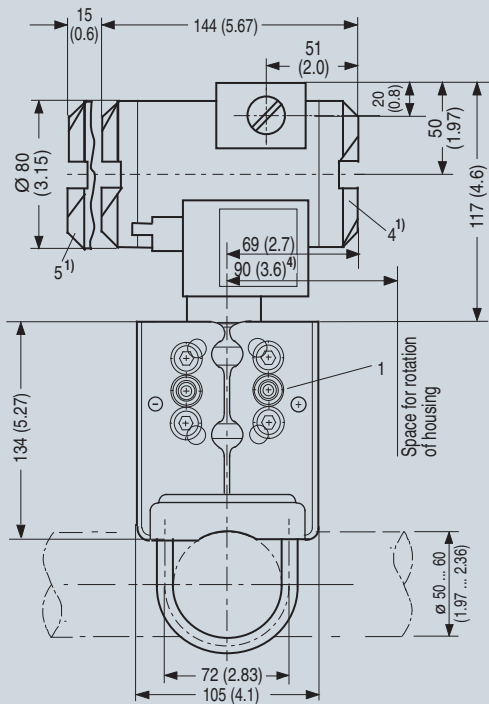
✓ = available

SITRANS P measuring instruments for pressure

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

DS III series
for differential pressure and flow

Dimensional drawings



- 1 Process connection: 1/4-18 NPT (EN 61518)
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland Pg 13,5 (adapter)^{2) 3)},
 - screwed gland M20x1,5³⁾,
 - screwed gland 1/2-14 NPT or
 - Han 7D/ Han 8U plug^{2) 3)}
- 4 Terminal side
- 5 Electronics side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Sealing screw with valve (option)
- 9 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
- 10 Lateral venting for liquid measurement (Standard)
- 11 Lateral venting for gas measurement (suffix H02)

- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA [is + xp]"
- 4) 92 mm (3.62 inch) for minimum distance to permit rotation with indicator
- 5) 45 mm (1.8 inch) for Pg 13,5 with adapter

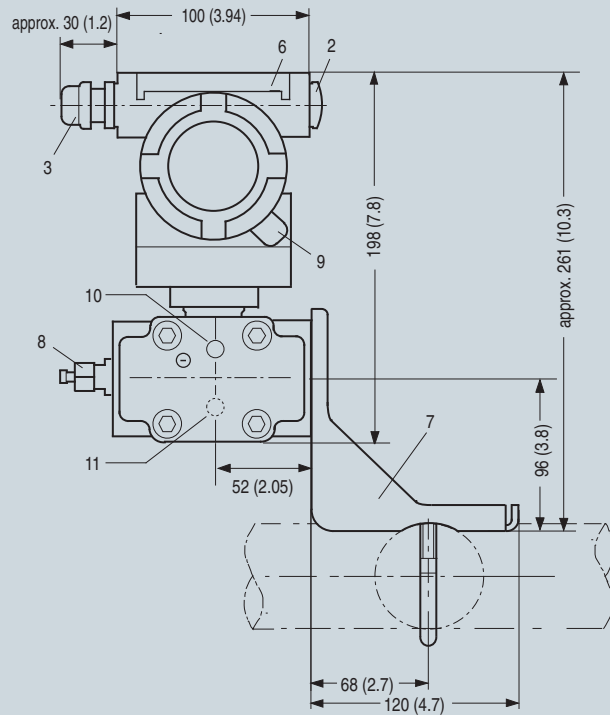
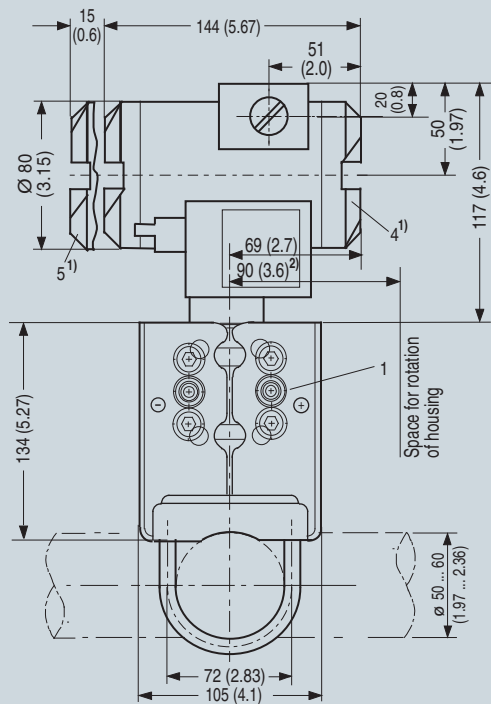
SITRANS P pressure transmitters, DS III HART series for differential pressure and flow, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

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

DS III series
for differential pressure and flow

2



- 1 Process connection: 1/4-18 NPT (EN 61518)
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland M20x1,5⁴⁾,
 - screwed gland 1/2-14 NPT or
 - PROFIBUS plug M12³⁾⁴⁾
- 4 Terminal side
- 5 Electronic side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Sealing screw with valve (option)
- 9 Screw cover – safety bracket (only for explosion-proof enclosure, not shown in the drawing)
- 10 Lateral venting for liquid measurement (Standard)
- 11 Lateral venting for gas measurement (suffix H02)

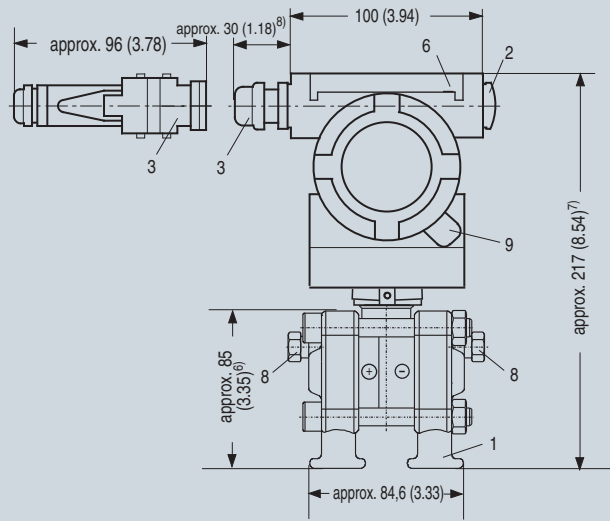
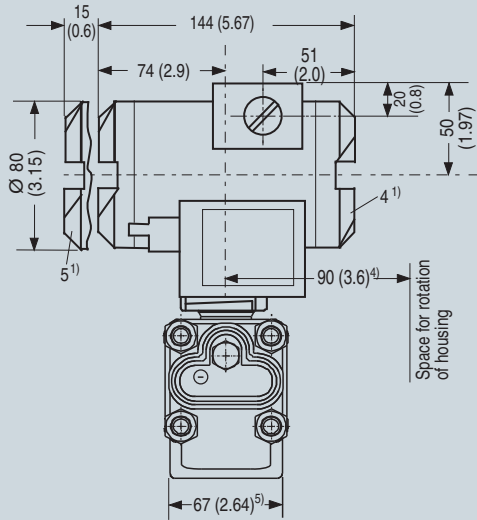
- 1) Allow approx. 20 mm (0.79 inch) thread length in addition
- 2) 92 mm (3.62 inch) for minimum distance to permit rotation with indicator
- 3) Not with type of protection "explosion-proof enclosure"
- 4) Not with type of protection "FM + CSA"

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

SITRANS P measuring instruments for pressure

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

DS III series
for differential pressure and flow



- 1 Process connection: 1/4-18 NPT (EN 61518)
- 2 Blanking plug
- 3 Electrical connection:
 - screwed gland Pg 13.5 (adapter) ^{2) 3)},
 - screwed gland M20x1,5 ³⁾,
 - screwed gland 1/2-14 NPT or
 - Han 7D/ Han 8U plug ^{2) 3)}
- 4 Terminal side
- 5 Electronics side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Sealing screw with valve (option)
- 9 Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)

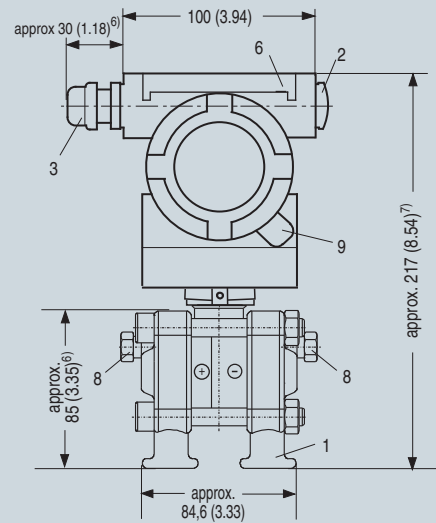
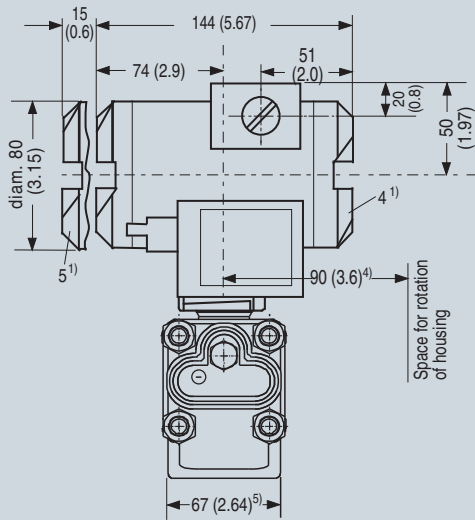
- 1) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
- 2) Not with type of protection "explosion-proof enclosure"
- 3) Not with type of protection "FM + CSA [is + xp]"
- 4) 92 mm (3.6 inch) for minimum distance to permit rotation with indicator
- 5) 74 mm (2.9 inch) for PN ≥ 420 (MWP ≥ 6092 psi)
- 6) 91 mm (3.6 inch) for PN ≥ 420 (MWP ≥ 6092 psi)
- 7) 219 mm (8.62 inch) for PN ≥ 420 (MWP ≥ 6092 psi)
- 8) 45 mm (1.8 inch) for Pg 13,5 with adapter

SITRANS P pressure transmitters, DS III HART series for differential pressure and flow, with process covers for vertical differential pressure lines, option „H03“, dimensions in mm (inch)

SITRANS P measuring instruments for pressure

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

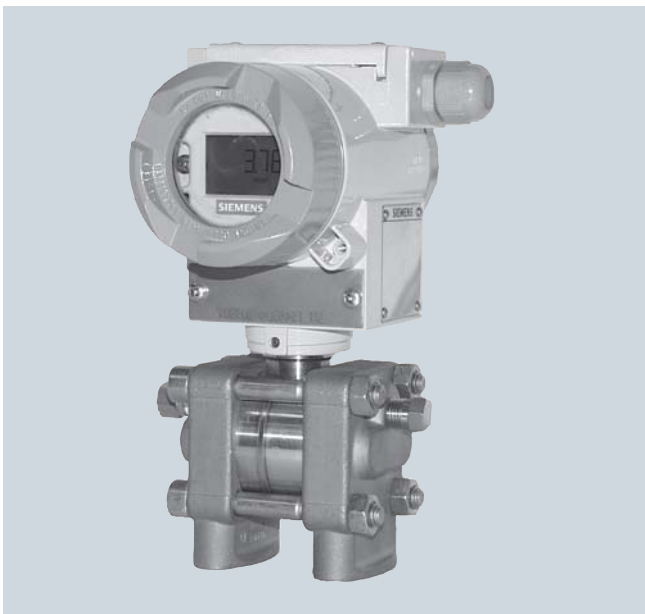
DS III series for differential pressure and flow



- 1 Process connection 1/4-18 NPT (EN 61 518)
- 2 Blanking plug
- 3 Electrical connection:
screwed gland M20x1.5³⁾
screwed gland 1/2-14 NPT or
PROFIBUS plug M12^{2) 3)}
- 4 Terminal side
- 5 Electronics side, digital display (longer overall length for cover with window)
- 6 Protective cover over keys
- 7 Mounting bracket (option)
- 8 Sealing screw with valve (option)
- 9 Screw cover safety bracket (only for explosion-proof enclosure, not shown in the drawing)

- 1) Allow approx. 20 mm (0.79 inch) thread length in addition
- 2) Not with type protection "explosion-proof enclosure"
- 3) Not with type protection "FM + CSA [is + xp]"
- 4) 92 mm (3.6 inch) for minimum distance to permit rotation without indicator
- 5) 74 mm (2.9 inch) for PN ≥ 420 (MWP ≥ 6092 psi)
- 6) 91 mm (3.6 inch) for PN ≥ 420 (MWP ≥ 6092 psi)
- 7) 219 mm (8.62 inch) for PN ≥ 420 (MWP ≥ 6092 psi)

SITRANS P pressure transmitters, DS III PA and FF series for differential pressure and flow, with process covers for vertical differential pressure lines, option „HO3“, dimensions in mm (inch)



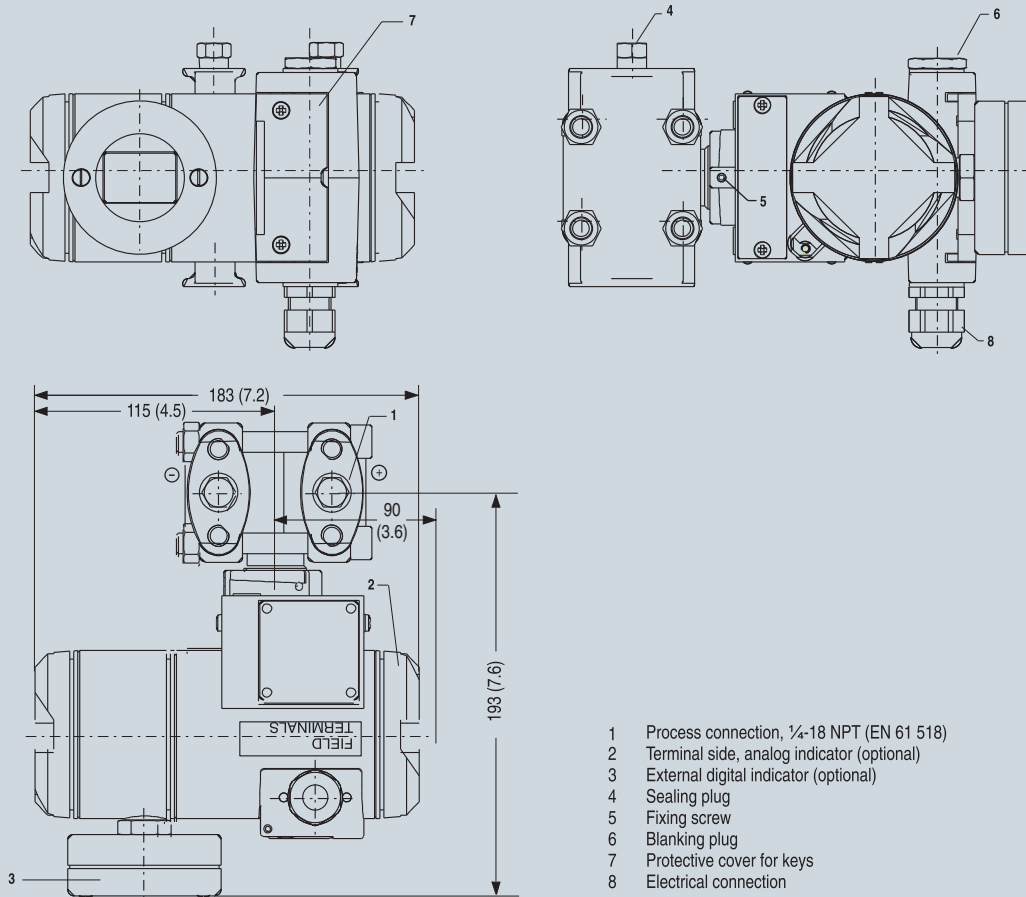
SITRANS P pressure transmitters, DS III series for differential pressure and flow, with process covers for vertical differential pressure lines

SITRANS P measuring instruments for pressure

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

DS III series
for differential pressure and flow

2



SITRANS P pressure transmitters, DS III FF series for differential pressure and flow, with digital indicator beside control keys, for vertical differential pressure lines, option „D27“, dimensions in mm (inch)



SITRANS P pressure transmitters, DS III series for differential pressure and flow, with digital indicator beside control keys

SITRANS P measuring instruments for pressure

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

DS III series for level

Technical specifications

SITRANS P, DS III series for level

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Input Measured variable Spans (infinitely adjustable) or nominal measuring range and max. permissible working pressure Lower measuring limit • Measuring cell with silicone oil filling Upper measuring limit	Level Span 25 ... 250 mbar g (0.36 ... 3.63 psi g) 25 ... 600 mbar g (0.36 ... 8.7 psi g) 53 ... 1600 mbar g (0.77 ... 23.2 psi g) 160 ... 5000 mbar g (2.32 ... 72.5 psi g)	Maximum working pressure Nominal measuring range Maximum working pressure See "Mounting flange" 250 mbar g (3.63 psi g) See "Mounting flange" 600 mbar g (8.7 psi g) See "Mounting flange" 1600 mbar g (23.2 psi g) See "Mounting flange" 5000 mbar g (72.5 psi g) See "Mounting flange"
	-100% of max. span or 30 mbar (0.435 psi a), depending on mounting flange	100% of the max. nominal measuring range
Output Output signal • Lower limit (infinitely adjustable) • Upper limit (infinitely adjustable) Load • Without HART communication • With HART communication Physical bus With polarity reversal protection	4 ... 20 mA 3.55 mA, factory preset to 3.84 mA 23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA $R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$ U_H : Power supply in V $R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)	Digital PROFIBUS PA or FOUNDATION Fieldbus signal - - - - IEC 61158-2 Yes
Accuracy Reference conditions (All error data refer always refer to the set span) Error in measurement and fixed-point setting (including hysteresis and repeatability) • Linear characteristic - $r \leq 10$ - $10 < r \leq 30$ - $30 < r \leq 100$ Long-term drift (temperature change $\pm 30 \text{ }^\circ\text{C}$ ($\pm 54 \text{ }^\circ\text{F}$)) Influence of ambient temperature • at $-10 \dots +60 \text{ }^\circ\text{C}$ ($14 \dots 140 \text{ }^\circ\text{F}$) - 250 mbar (3.63 psi) measuring cell - 600 mbar (8.7 psi) measuring cell - 1600 and 5000 mbar (23.2 and 72.5 psi) measuring cells • at $-40 \dots -10 \text{ }^\circ\text{C}$ and $+60 \dots +85 \text{ }^\circ\text{C}$ ($-40 \dots +14 \text{ }^\circ\text{F}$ and $140 \dots 185 \text{ }^\circ\text{F}$) - 250 mbar (3.63 psi) measuring cell - 600 mbar (8.7 psi) measuring cell - 1600 and 5000 mbar (23.2 and 72.5 psi) measuring cells	To EN 60770-1 Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, silicone oil filling, room temperature $25 \text{ }^\circ\text{C}$ ($77 \text{ }^\circ\text{F}$) r: Span ratio ($r = \text{max. span} / \text{set span}$) $\leq 0.15\%$ $\leq 0.3\%$ $\leq (0.0075 \cdot r + 0.075)\%$ $\leq (0.25 \cdot r)\%$ every 5 years static pressure max. 70 bar g (1015 psi g) $\leq (0.5 \cdot r + 0.2)\%$ (0.4 instead of 0.2 with $10 < r \leq 30$) $\leq (0.3 \cdot r + 0.2)\%$ (0.4 instead of 0.2 with $10 < r \leq 30$) $\leq (0.25 \cdot r + 0.2)\%$ (0.4 instead of 0.2 with $10 < r \leq 30$) $\leq (0.25 \cdot r + 0.15)\%/10 \text{ K}$ double values with $10 < r \leq 30$ $\leq (0.15 \cdot r + 0.15)\%/10 \text{ K}$ double values with $10 < r \leq 30$ $\leq (0.12 \cdot r + 0.15)\%/10 \text{ K}$ double values with $10 < r \leq 30$	$\leq 0.075\%$ $\leq 0.25\%$ every 5 years static pressure max. 70 bar g (1015 psi g) $\leq 0,7\%$ $\leq 0,5\%$ $\leq 0,45\%$ $\leq 0.4\%/10 \text{ K}$ $\leq 0.3\%/10 \text{ K}$ $\leq 0.27\%/10 \text{ K}$

SITRANS P measuring instruments for pressure

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

**DS III series
for level**

2

SITRANS P, DS III series for level

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Influence of static pressure <ul style="list-style-type: none"> on the zero point <ul style="list-style-type: none"> - 250 mbar (3.63 psi) measuring cell - 600 mbar (8.7 psi) measuring cell - 1600 and 5000 mbar (23.2 and 72.5 psi) measuring cells on the span Measured Value Resolution	$\leq (0.3 \cdot r)\%$ per nominal pressure $\leq (0.15 \cdot r)\%$ per nominal pressure $\leq (0.1 \cdot r)\%$ per nominal pressure $\leq (0.1 \cdot r)\%$ per nominal pressure -	$\leq 0.3\%$ per nominal pressure $\leq 0.15\%$ per nominal pressure $\leq 0.1\%$ per nominal pressure $\leq 0.1\%$ per nominal pressure $3 \cdot 10^{-5}$ of nominal measuring range
Rated operating conditions Degree of protection (to EN 60529) Process temperature <ul style="list-style-type: none"> Measuring cell with silicone oil filling <ul style="list-style-type: none"> - High-pressure side - Low-pressure side Ambient conditions <ul style="list-style-type: none"> Ambient temperature <ul style="list-style-type: none"> - Digital indicators Storage temperature Climatic class <ul style="list-style-type: none"> - Condensation Electromagnetic compatibility <ul style="list-style-type: none"> - Emitted interference and interference immunity 	IP65 Note: Always take into account assignment of max. permissible working temperature to max. permissible working pressure of the respective flange connection! -40 ... +100 °C (-40 ... +212 °F) $p_{abs} \geq 1\text{bar}$: -40 ... +175 °C (-40 ... +347 °F) $p_{abs} \geq 1\text{bar}$: -40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F) -20 ... +60 °C (-4 ... +140 °F) in conjunction with dust explosion protection -30 ... +85 °C (-22 ... +185 °F) -50 ... +85 °C (-58 ... +185 °F) Permissible To EN 61326 and NAMUR NE 21	
Design Weight (without options) <ul style="list-style-type: none"> To EN (pressure transmitter with mounting flange, without tube) To ASME (pressure transmitter with mounting flange, without tube) Wetted parts materials Housing material High-pressure side <ul style="list-style-type: none"> Seal diaphragm of mounting flange Measuring cell filling Process connection <ul style="list-style-type: none"> High-pressure side Low-pressure side 	$\approx 11 \dots 13 \text{ kg}$ ($\approx 24.2 \dots 28.7 \text{ lb}$) $\approx 11 \dots 18 \text{ kg}$ ($\approx 24.2 \dots 39.7 \text{ lb}$) Poor in copper die-cast aluminium, GD-AISI12 or stainless steel precision casting, mat. No. 1.4408 Stainless steel, mat. No. 1.4404/316L, Monel, 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 Silicone oil Flange to EN and ASME Female thread $\frac{1}{4}$ -18 NPT and flange connection with mounting thread M10 to DIN 19213 or $\frac{7}{16}$ -20 UNF to EN 61518	
Power supply U_H Terminal voltage on transmitter Separate 24 V power supply necessary Bus voltage <ul style="list-style-type: none"> Not Ex With intrinsically-safe operation Current consumption <ul style="list-style-type: none"> Basic current (max.) Startup current \leq basic current Max. current in event of fault Fault disconnection electronics (FDE) available	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode - - - - - - - -	Supplied through bus - No 9 ... 32 V 9 ... 24 V 12.5 mA Yes 15.5 mA Yes

SITRANS P measuring instruments for pressure

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

DS III series for level

SITRANS P, DS III series for level

	HART	PROFIBUS PA or FOUNDATION Fieldbus
Certificate and approvals		
Classification according to pressure equipment directive (DRGL 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 3, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 99 ATEX 2122	
- Identification	Ex II 1/2 G EEx ia/ib IIB/IIC T6	
- 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 maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Identification	Ex II 1/2 G EEx d IIC T4/T6	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Identification	Ex II 1 D IP65 T 120 °C Ex II 1/2 D IP65 T 120 °C	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Identification	Ex II 2 D IP65 T 120 °C	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$
• Type of protection "n" (zone 2)	TÜV 01 ATEX 1696 X	Planned
- Identification	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection to FM	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	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	

SITRANS P measuring instruments for pressure

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

**DS III series
for level**

2

HART communication

HART communication	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 measuring value) or 10 (two measuring 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 T_{63} , adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	Can be parameterized (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	Can be parameterized (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

Communication FOUNDATION Fieldbus

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 T_{63} , adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	Can be parameterized (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 FF 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

Mounting flange

Nom. diam.	Nom. press.
• To EN 1092-1	
- DN 80	PN 40
- DN 100	PN16, PN40
• To ASME B16.5	
- 3 inch	Class 150, class 300
- 4 inch	Class 150, class 300

SITRANS P measuring instruments for pressure

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

DS III series for level

2

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for level series DS III HART		7MF4633-
Measuring cell filling	Measuring cell cleaning	Y -
Silicone oil	Standard	1
Span		
25 ... 250 mbar	(0.363 ... 3.63 psi)	D
25 ... 600 mbar	(0.363 ... 8.70 psi)	E
53 ... 1600 mbar	(0.77 ... 23.2 psi)	F
0.16 ... 5 bar	(2.32 ... 72.5 psi)	G
Process connection of low-pressure side		
Female thread 1/4-18 NPT with flange connection		
• Mounting thread 7/16-20 UNF to EN 61518		2
• Mounting thread M10 to DIN 19213 (only for replacement needs)		0
Non-wetted parts materials		
Process flange screws	Electronics housing	
Stainless steel	Die-cast aluminium	2
Stainless steel	Stainless steel precision casting ¹⁾	3
Version		
• Standard version		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Explosion protection		
• Without		A
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		B
- "Explosion-proof (EEx d)" ²⁾		D
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d)" ³⁾		P
- "Ex nA/nL (zone 2)"		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D)" ³⁾		R
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)" ¹⁾		NC
Electrical connection / cable entry		
• Screwed gland Pg 13.5 ⁴⁾		A
• Screwed gland M20x1.5		B
• Screwed gland 1/2-14 NPT		C
• Han 7D plug (plastic housing) incl. mating connector ⁴⁾		D
• M12 connectors (metal) ⁵⁾		F
Display		
• Without indicator		0
• Without visible digital indicator (digital indicator ► hidden, setting: mA)		1
• With visible digital indication		6
• With customer-specific digital indication (setting as specified, Order code "Y21" or required)		7

Ordering information:

1st order item: Pressure transmitter 7MF4633-...

2nd order item: Mounting flange 7MF4912-3...

Ordering example:

Item line 1: 7MF4633-1EY20-1AA1-Z

B line: Y01

C line: Y01: 80 to 143 mbar (1.16 to 2.1 psi)

Item line 2: 7MF4912-3GE01

Power supply units see "SITRANS I power supply units and isolation amplifiers".

Included in delivery of the device:

- Brief instructions (Leporello)
- CD-ROM with detailed documentation
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

- 1) Not together with Electrical connection „Screwed gland Pg 13.5“ and „Han7D plug“.
- 2) Without cable gland, with blanking plug.
- 3) With enclosed cable gland EEx ia and blanking plug.
- 4) Not together with type of protection "Explosion-proof" and type of protection "Ex nA".
- 5) Not together with types of protection "Explosion-proof" or "Intrinsic safety and explosion-proof"

SITRANS P measuring instruments for pressure

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

**DS III series
for level**

Selection and Ordering data		Order No.	Selection and Ordering data		Order code
SITRANS P pressure transmitter for level			Further designs		
DS III PA series (PROFIBUS PA)		7 MF 4 6 3 4 -	Add "-Z" to Order No. and specify Order code.		HART PA FF
DS III FF series (FOUNDATION Fieldbus)		7 MF 4 6 3 5 -	O-rings for process flanges on low-pressure side (instead of FPM (Viton))		
		1 ■ Y ■ ■ - ■ ■ ■ ■	• PTFE (Teflon)		A20 ✓ ✓ ✓
Nominal measuring range			• FEP (with silicone core, approved for food)		A21 ✓ ✓ ✓
250 mbar	(3.63 psi)	D	• FPPM (Kalrez, compound 4079)		A22 ✓ ✓ ✓
600 mbar	(8.70 psi)	E	• NBR (Buna N)		A23 ✓ ✓ ✓
1600 mbar	(23.2 psi)	F	Plug		
5 bar	(72.5 psi)	G	• Han 7D (metal, gray)		A30 ✓
Process connection of low-pressure side			• Han 8U (instead of Han 7D)		A31 ✓
Female thread 1/4-18 NPT with flange connection			Sealing screws		
• Mounting thread M10 to DIN 19213 (only for replacement needs)		0	1/4-18 NPT, with valve in material of process flanges		A40 ✓ ✓ ✓
• Mounting thread 7/16-20 UNF to EN 61518		2	Cable sockets for M12 connectors (metal)		A50 ✓ ✓ ✓
Non-wetted parts materials			Rating plate inscription (instead of German)		
Process flange screws	Electronics housing		• English		B11 ✓ ✓ ✓
Stainless steel	Die-cast aluminium	2	• French		B12 ✓ ✓ ✓
Stainless steel	Stainless steel precision casting	3	• Spanish		B13 ✓ ✓ ✓
Version			• Italian		B14 ✓ ✓ ✓
• Standard version		1	English rating plate		B21 ✓ ✓ ✓
• International version, English label inscriptions, documentation in 5 languages on CD		2	Pressure units in inH ₂ O or psi		
Explosion protection			Quality inspection certificate (Factory calibration) to IEC 60770-2		C11 ✓ ✓ ✓
• Without		A	Acceptance test certificate		C12 ✓ ✓ ✓
• With ATEX, Type of protection:			To EN 10204-3.1		
- "Intrinsic safety (EEx ia)"		B	Factory certificate		C14 ✓ ✓ ✓
- "Explosion-proof (EEx d) ¹⁾ "		D	"Functional Safety (SIL)" certificate		C20 ✓
- "Intrinsic safety and explosion-proof enclosure (EEx ia + EEx d) ²⁾ "		P	"PROFIsafe" certificate and protocol		C21 ✓
- "Ex nA/nL (zone2)"		E	Setting of upper limit of output signal to 22.0 mA		D05 ✓
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + Zone 1D/2D) ²⁾ (not for DS III FF)		R	Type of protection IP68 (not together with PROFIBUS plug M12)		D12 ✓ ✓ ✓
• With FM + CSA, Type of protection:			Supplied with oval flange (1 item), PTFE packing and stainless steel screws in thread of process flange		D37 ✓ ✓ ✓
- "Intrinsic safety and explosion-proof (is + xp) ¹⁾ "		NC	Use on zone 1D / 2D (only together with type of protection "Intrinsic safety (EEx ia)")		E01 ✓ ✓ ✓
Electrical connection / cable entry			Use on zone 0 (only together with type of protection "Intrinsic safety (EEx ia)")		E02 ✓ ✓ ✓
• Screwed gland M20x1.5		B	Overfilling safety device for flammable and non-flammable liquids (max. PN 32 (MVWP 464 psi), basic device with type of protection "Intrinsic safety (EEx ia)")		E08 ✓ ✓
• Screwed gland 1/2-14 NPT		C	Explosion-proof "Intrinsic safety" to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..)		E25 ✓ ✓ ✓
• Plug M12 incl. mating connector ³⁾		F	Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)		E55 ✓ ✓ ✓
Display			Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)		E56 ✓ ✓ ✓
• Without indicator		0	Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)		E57 ✓ ✓ ✓
• Without visible digital indicator (digital indicator hidden, setting: mA)		1	Interchanging of process connection side		H01 ✓ ✓ ✓
• With visible digital indication		6			
• With customer-specific digital indication (setting as specified, Order code "Y21" or required)		7			
Ordering information:					
1st order item: Pressure transmitter 7MF4634-...					
2nd order item: Mounting flange 7MF4912-...					
Ordering example:					
Item line 1: 7MF4634-1EY20-1AA1					
Item line 2: 7MF4912-3GE01					
Included in delivery of the device:					
• Brief instructions (Leporello)					
• CD-ROM with detailed documentation					
• Sealing plug(s) or sealing screw(s) for the process flanges(s)					
1) Without cable gland, with blanking plug.					
2) With enclosed cable gland EEx ia and blanking plug.					
3) Not together with types of protection "Explosion-proof" and "Intrinsic safety and explosion-proof"					

SITRANS P measuring instruments for pressure

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

DS III series for level

2

Selection and Ordering data		Order code			Selection and Ordering data		Order No.Ord. code		
Additional data			HART	PA	FF	Mounting flange		7MF4912 -	
Add "-Z" to Order No. and specify Order code.						Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series		3 ■■■ ■■■ ■■■ ■■■	
Measuring range to be set	Y01	✓				Connection acc. to EN 1092-1			
Specify in plain text (max. 5 digits): Y01: ... up to ... mbar, bar, kPa, MPa, psi						Nom. diam.			
						DN 80		PN 40	
						DN 100		PN 16	
								PN 40	
Measuring point number (TAG No.)	Y15	✓	✓	✓		Connection acc. to ASME B16.5			
Max. 16 characters, specify in plain text: Y15:						Nom. diam.			
						3 inch		Class 150	
								Class 300	
						4 inch		Class 150	
								Class 300	
Measuring point text	Y16	✓	✓	✓		Other version, add Order code and plain text: Nominal diameter: ...; Nominal pressure: ...			
Max. 27 characters, specify in plain text: Y16:								J 1 Y	
Entry of HART address (TAG)	Y17	✓				Wetted parts materials			
Max. 8 characters, specify in plain text: Y17:						• Stainless steel 316L		A	
						- Coated with PFA		D	
						- Coated with PTFE		E	
						- Coated with ECTFE ¹⁾		F	
Setting of pressure indicator in pressure units	Y21	✓	✓	✓		• Monel 400, mat. No. 2.4360		G	
Specify in plain text (standard setting: mA): Y21: mbar, bar, kPa, MPa, psi, ...						• Hastelloy B2, mat. No. 2.4617		H	
Note: The following pressure units can be selected: bar, mbar, mm H ₂ O ¹⁾ , inH ₂ O ¹⁾ , ftH ₂ O ¹⁾ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or %) ref. temperature 20 °C						• Hastelloy C276, mat. No. 2.4819		J	
						• Hastelloy C4, mat. No. 2.4610		U	
						• Tantalum		K	
Setting of pressure indicator in non-pressure units	Y22¹⁾ + Y01	✓				Other version, add Order code and plain text: material of parts in contact with the medium: ... Sealing face, see "Technical specifications"		Z	
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)								K 1 Y	
Preset bus address	Y25		✓			Tube length			
(possible between 1 and 126) Specify in plain text: Y25:						• Without		0	
						• 50 mm (1.97 inch)		1	
						• 100 mm (3.94 inch)		2	
						• 150 mm (5.90 inch)		3	
						• 200 mm (7.87 inch)		4	
						Other version: add Order code and plain text: Tube length: ...		9	
								L 1 Y	
						Filling liquid			
						• Silicone oil M5		1	
						• Silicone oil M50		2	
						• High-temperature oil		3	
						• Halocarbon oil (for O ₂ measurements)		4	
						• Glycerin / water ²⁾		6	
						• Food oil (FDA-listed)		7	
						Other version, add Order code and plain text: filling liquid: ...		9	
								M 1 Y	

Only "Y01", "Y21", "Y22", "Y25" and "D05" can be factory preset

✓ = available

¹⁾ Not together with over-filling safety device for flammable and non-flammable liquids (Order code "E08")

¹⁾ For vacuum on request

²⁾ Not suitable for use in low-pressure range

SITRANS P measuring instruments for pressure

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

DS III series
for level

2

Selection and Ordering data	Order code		
<i>Further designs</i>		HART	PA and FF
Add "-Z" to Order No. and specify Order code.			
Flame flashover lock-out For mounting on zone 0 (including documentation)	A01	✓	✓
Quality inspection certificate (Factory calibration) to IEC 60770-2	C11	✓	✓
Acceptance test certificate To EN 10204-3.1	C12	✓	✓
Vacuum-proof design (for use in low-pressure range)	V04	✓	✓
Calculation of span of associated pressure transmitter (enclose filled-in questionnaire with order) Note: suffix "Y01" required with pressure transmitter!	Y05	✓	✓

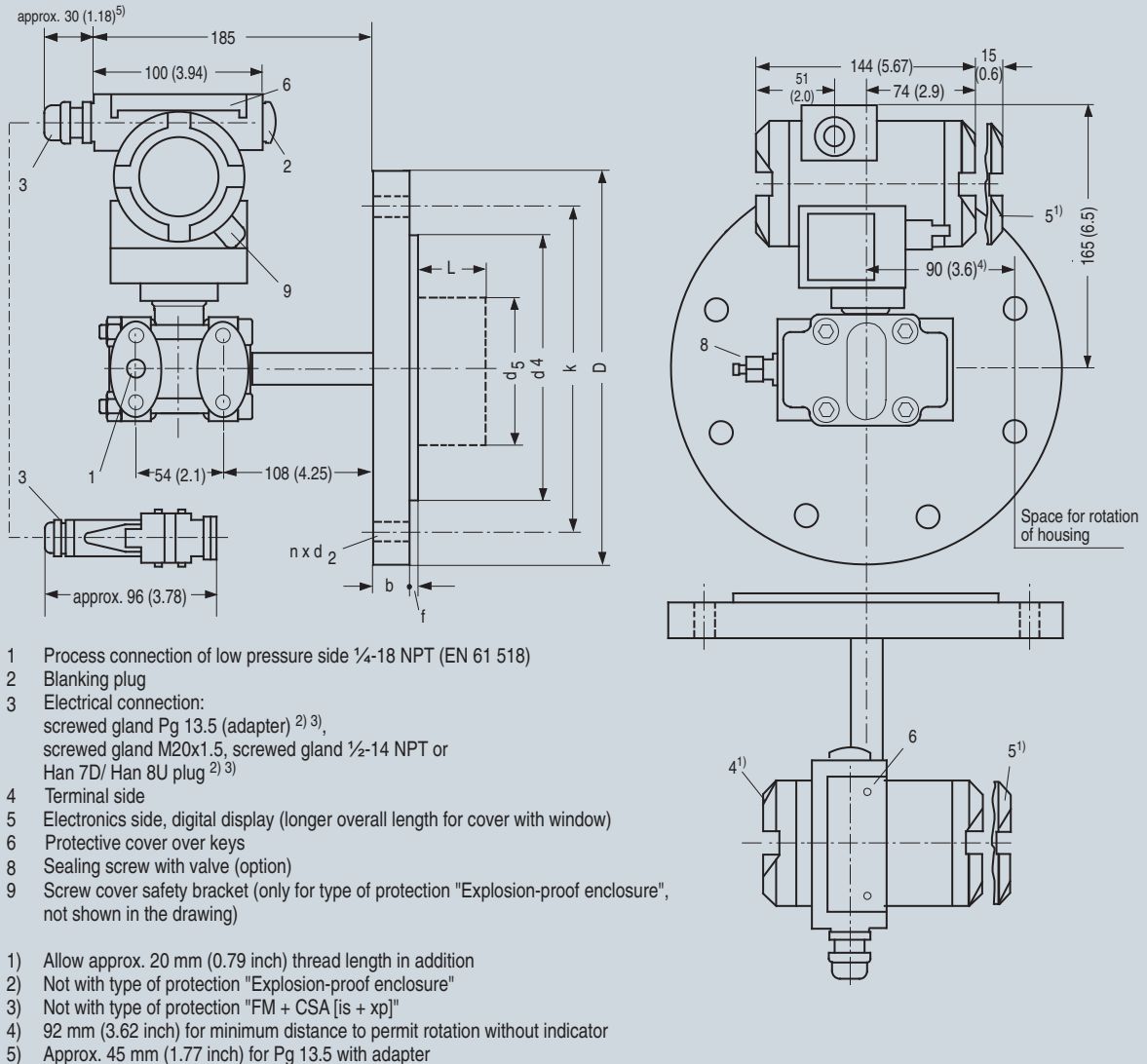
✓ = available

SITRANS P measuring instruments for pressure

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

DS III series
for level

Dimensional drawings



SITRANS P pressure transmitters, DS III HART series for level, including mounting flange, dimensions in mm (inch)

Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d	d ₂	d ₄	d ₅	d _M	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 80	PN 40	24	200	90	18	138	76	72 ¹⁾	2	160	8	0, 50, 100, 150 or 200
DN 100	PN 40	20	220	115	18	158	94	89	2	180	8	
	PN 40	24	235	115	22	162	94	89	2	190	8	

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d ₂	d ₄	d ₅	d _M	f	k	n	L
	lb/sq.in.	inch	inch	inch	inch	inch	inch	inch	inch		inch
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)
3 inch	150	0.94 (23.8)	7.5 (190.5)	0.75 (19.0)	5 (127)	3 (76)	2.81 ¹⁾ (72)	0.06 (1.6)	6 (152.4)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	1.12 (28.6)	8.25 (209.5)	0.87 (22.2)	5 (127)	3 (76)	2.81 ¹⁾ (72)	0.06 (1.6)	6.69 (168.3)	8	
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	
	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

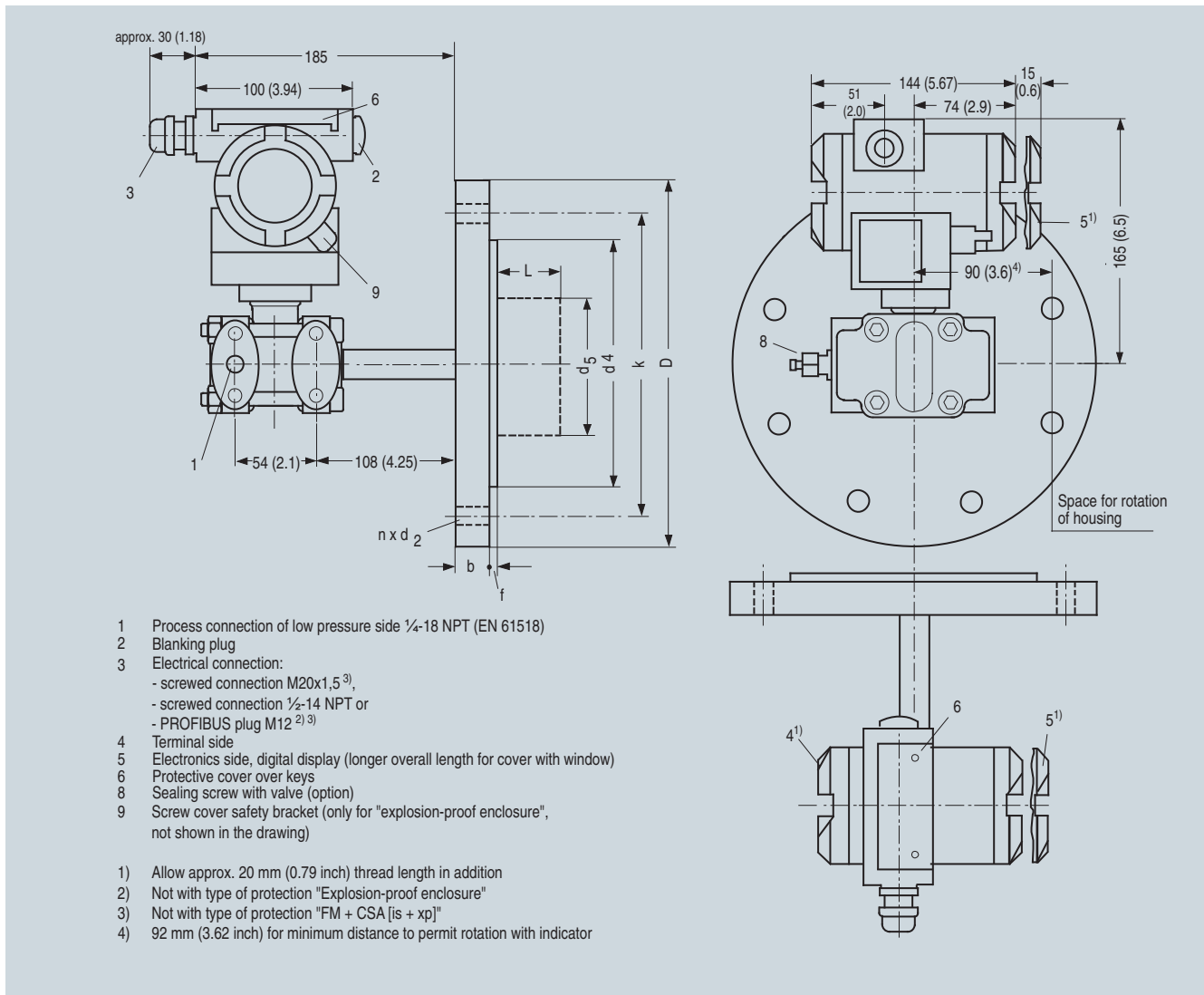
¹⁾ 89 mm = 3½ inch with tube length L = 0.

SITRANS P measuring instruments for pressure

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

**DS III series
for level**

2



SITRANS P pressure transmitters, DS III PA and FF series for level, including mounting flange, dimensions in mm (inch)

Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d	d ₂	d ₄	d ₅	d _M	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 80	PN 40	24	200	90	18	138	76	72 ¹⁾	2	160	8	0, 50, 100, 150 or 200
DN 100	PN 40	20	220	115	18	158	94	89	2	180	8	
	PN 40	24	235	115	22	162	94	89	2	190	8	

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d ₂	d ₄	d ₅	d _M	f	k	n	L
	lb/sq.in.	inch	inch	inch	inch	inch	inch	inch	inch		inch
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)		(mm)
3 inch	150	0.94 (23.8)	7.5 (190.5)	0.75 (19.0)	5 (127)	3 (76)	2.81 ¹⁾ (72)	0.06 (1.6)	6 (152.4)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	1.12 (28.6)	8.25 (209.5)	0.87 (22.2)	5 (127)	3 (76)	2.81 ¹⁾ (72)	0.06 (1.6)	6.69 (168.3)	8	
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	
	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 = 3½ inch with tube length L = 0.