Pressure Measurement

You can download all instructions, catalogs and certificates for SITRANS P free of charge at the following Internet address: www.siemens.com/sitransp

2

Overview

	Application	Description		Software for parameterization
SITRANS P · Transmitters for basic requirements				
	Two or three-wire transmitters for measuring gauge and absolute pressure	**SITRANS P200** • Single-range transmitters for gauge and absolute pressure • Ceramic measuring cell • For general applications	2/4	–
		SITRANS P210 • Single-range transmitters for gauge pressure • Stainless steal measuring cell • For low-pressure applications	2/10	–
		SITRANS P220 • Single-range transmitters for gauge pressure • Stainless steel measuring cell, fully welded • For high-pressure applications and refrigeration technology	2/15	–
	Two or three-wire transmitter for measuring differential pressure	**SITRANS P250** Compact single-range transmitters Analog electronics Available ex stock	2/21	–
	Two-wire transmitter for measuring hydrostatic levels	**SITRANS P MPS (submersible sensor)** For measuring liquid levels in wells, tanks, channels, dams etc.	2/26	–
SITRANS P · Transmitters for pressure with WirelessHART communication				
	Wireless transmitter with WirelessHART for measuring gauge and absolute pressure	**SITRANS P280** Wireless communication with WirelessHART Battery power supply Parameterization with SIMATIC PDM via WirelessHART or local with HARTmodem and using local pushbuttons	2/31	SIMATIC PDM
SITRANS P · Transmitters for food, pharmaceuticals and biotechnology				
	Two-wire transmitters for measuring gauge and absolute pressure	**SITRANS P300** • Sanitary design according to EHEDG, FDA and GMP • Parameterization over 3 buttons or communication over HART, PROFIBUS PA or FOUNDATION Fieldbus • Standard process connection G½", ½-NPT and flush-mounted process connections available • Turn down 100 : 1	2/36	SIMATIC PDM
		**Factory-mounting of valve manifolds on SITRANS P300 transmitters** • Simplified assembly • With pressure test • Stainless steel valve manifolds	2/57	–
SITRANS P · Transmitters for gauge pressure for the paper industry				
	Two-wire transmitters for measuring gauge pressure	**SITRANS P DS III and SITRANS P300 with PMC connection** • Turn down 100 : 1 • Process connections for the paper industry • Parameter assignment over 3 buttons and HART, PROFIBUS PA or FOUNDATION Fieldbus	2/59	SIMATIC PDM

	Application	Description		Software for parameterization
SITRANS P · Transmitters for general requirements				
	Two-wire transmitters for measuring: • Gauge pressure, • Absolute pressure, • Differential pressure and • Flow or • Level	**SITRANS P DS III** Turn down: 100 : 1 Parameterization using: • 3 pushbuttons and HART for DS III series • 3 pushbuttons and PROFIBUS-PA for DS III PA series • 3 buttons and FOUNDATION Fieldbus for DS III FF series • Available ex stock	2/76	SIMATIC PDM SIMATIC PDM
		**Factory mounting of valve manifolds on gauge, absolute or differential pressure transmitters SITRANS P DS III** • Simplified assembly • With pressure test • Stainless steel valve manifolds	2/148	–
SITRANS P - Transmitters for High Performance requirements				
	Two-wire transmitters for measuring: • Differential pressure • Volume flow • Mass flow • Level • Volume • Mass	**SITRANS P500** • Range adjustment: 200 :1 • High measuring accuracy • Very fast response time • Extremely good long-term stability Parameterization: • 3 buttons or HART	2/151	SIMATIC PDM
		Factory-mounting of manifolds on differential pressure transmitters SITRANS P500 • Simplified assembly • With pressure test • Stainless steel valve manifolds	2/175	
Remote seals for transmitters and pressure gauges				
	Remote seals for measuring viscous, corrosive or fibrous media (as well as media at extreme temperatures)	Remote seals in pancake and flange designs Quick-release remote seals for the food industry Wide range of diaphragm materials and filling liquids available	2/178	–
Fittings				
	Shutting off the lines for the medium and differential pressure Mounting of transmitter on valve manifold or shut-off fitting	Shut-off fittings and valve manifolds available in steel, brass or stainless steel Valve manifolds available for the various process connections of the SITRANS P transmitters	2/217	–

SITRANS P200
for gauge and absolute pressure

Overview

The SITRANS P200 pressure transmitter measures the gauge and absolute pressure of liquids, gases and vapors.

- Ceramic measuring cell
- Gauge and absolute measuring ranges 1 to 60 bar (15 to 1000 psi)
- For general applications

Benefits

- High measuring accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapors
- Compact design

Application

The SITRANS P200 pressure transmitter for gauge and absolute pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

Design

Device structure without explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a round plug M12 (IP67), a cable (IP67) or a cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

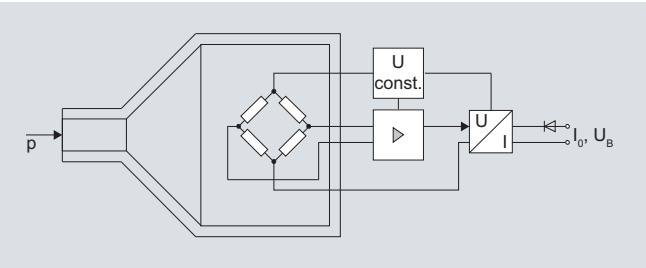
Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65) or a round plug M12 (IP67) connected electrically. The output signal is between 4 and 20 mA.

Function

The pressure transmitter measures the gauge and absolute pressure of liquids and gases as well as the level of liquids.

Mode of operation



SITRANS P200 pressure transmitters (7MF1565-...), functional diagram

The ceramic measuring cell has a thin-film resistance bridge to which the operating pressure p is transmitted through a ceramic diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

Technical specifications

Application	
Gauge and absolute pressure measurement	Liquids, gases and vapors
Mode of operation	
Measuring principle	Piezo-resistive measuring cell (ceramic diaphragm)
Measured variable	Gauge and absolute pressure
Inputs	
Measuring range	
• Gauge pressure - Metric - US measuring range	 1 … 60 bar (15 … 870 psi) 15 … 1000 psi
• Absolute pressure - Metric - US measuring range	 0.6 … 16 bar a (10 … 232 psia) 10 … 300 psia
Output	
Current signal	4 ... 20 mA
• Load	$(U_B - 10\ V) / 0.02\ A$
• Auxiliary power U_B	DC 7 ... 33 V (10 ... 30 V for Ex)
Voltage signal	0 ... 10 V DC
• Load	≥ 10 kΩ
• Auxiliary power U_B	12 ... 33 V DC
• Power consumption	< 7 mA at 10 kΩ
Characteristic curve	Linear rising
Measuring accuracy	
Error in measurement at limit setting incl. hysteresis and reproducibility	• Typical: 0.25 % of full-scale value • Maximum: 0.5 % of full-scale value
Step response time T_{99}	< 5 ms
Long-term stability	
• Lower range value and measuring span	0.25 % of full-scale value/year
Influence of ambient temperature	
• Lower range value and measuring span	0.25 %/10 K of full-scale value
• Influence of power supply	0.005 %/V
Conditions of use	
Process temperature with gasket made of:	
• FPM (Standard)	-15 ... +125 °C (+5 ... +257 °F)
• Neoprene	-35 ... +100 °C (-31 ... +212 °F)
• Perbunan	-20 ... +100 °C (-4 ... +212 °F)
• EPDM	-40 ... +145 °C (-40 ... +293 °F), usable for drinking water
Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
Storage temperature	-50 ... +100 °C (-58 ... +212 °F)
Degree of protection (to EN 60529)	• IP 65 with connector per EN 175301-803-A • IP 67 with M12 connector • IP 67 with cable • IP 67 with cable quick screw connection
Electromagnetic compatibility	• acc. EN 61326-1/-2/-3 • acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation ≤ 1 %

Design	
Weight	Approx. 0.090 kg (0.198 lb)
Process connections	See dimensional drawings
Electrical connections	• Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or ½-14 NPT or Pg 11 • M12 connector • 2 or 3-wire (0.5 mm^2) cable (∅ ± 5.4 mm) • Cable quick screw connection
Wetted parts materials	
• Measuring cell	Al_2O_3 - 96 %
• Process connection	Stainless steel, mat. No. 1.4404 (SST 316 L)
• Gasket	• FPM (Standard) • Neoprene • Perbunan • EPDM
Non-wetted parts materials	
• Enclosure	Stainless steel, mat. No. 1.4404 (SST 316 L)
• Rack	Plastic
• Cables	PVC
Certificates and approvals	
Classification according to pressure equipment directive (PED 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)
Lloyds Register of Shipping (LR)	Applied
Germanischer Lloyds Register of Shipping (GL)	Applied
American Bureau of Shipping (ABS)	Applied
Bureau Veritas (BV)	Applied
Det Norske Veritas (DNV)	Applied
Drinking water approval (ACS)	Applied
GOST	Applied
Explosion protection	
Intrinsic safety "i" (only with current output)	Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db
EC type-examination certificate	SEV 10 ATEX 0146
Connection to certified intrinsically-safe resistive circuits with maximum values:	$U_i \leq 30\ V\ DC$; $I_i \leq 100\ mA$; $P_i \leq 0.75\ W$
Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	$L_i = 0\ nH$; $C_i = 0\ nF$

SITRANS P200
for gauge and absolute pressure

Selection and Ordering data

Order No. | Order code

SITRANS P200 pressure transmitters for pressure and absolute pressure for general applications D) **7MF1565-** ■■■■■ - ■■■■ ■■■

Characteristic curve deviation typ. 0.25 %

Wetted parts materials: Ceramic and stainless steel + sealing material

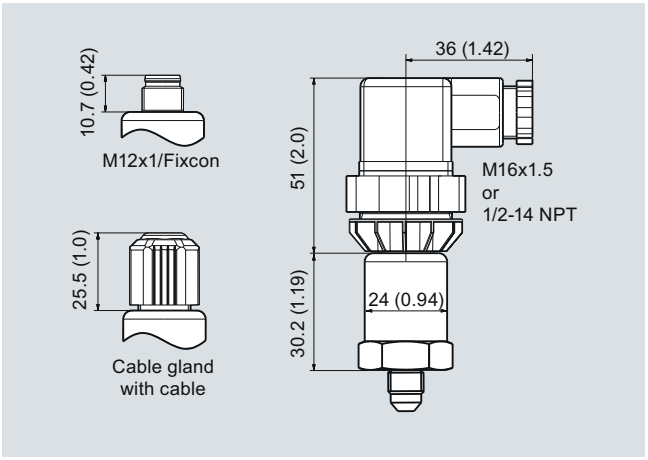
Non-wetted parts materials: stainless steel

Measuring range	Overload limit Min.	Overload limit Max.	Burst pressure	
For gauge pressure				
0 ... 1 bar (0 ... 14.5 psi)	-0.4 bar (-5.8 psi)	2.5 bar (36.26 psi)	> 2,5 bar (> 36.3 psi)	**3 B A**
0 ... 1.6 bar (0 ... 23.2 psi)	-0.4 bar (-5.8 psi)	4 bar (58.02 psi)	> 4 bar (> 58.0 psi)	**3 B B**
0 ... 2.5 bar (0 ... 36.3 psi)	-0.8 bar (-11.6 psi)	6.25 bar (90.65 psi)	> 6,25 bar (> 90.7 psi)	**3 B D**
0 ... 4 bar (0 ... 58.0 psi)	-0.8 bar (-11.6 psi)	10 bar (145 psi)	> 10 bar (> 145 psi)	**3 B E**
0 ... 6 bar (0 ... 87.0 psi)	-1 bar (-14.5 psi)	15 bar (217 psi)	> 15 bar (> 217 psi)	**3 B G**
0 ... 10 bar (0 ... 145 psi)	-1 bar (-14.5 psi)	25 bar (362 psi)	> 25 bar (> 362 psi)	**3 C A**
0 ... 16 bar (0 ... 232 psi)	-1 bar (-14.5 psi)	40 bar (580 psi)	> 40 bar (> 580 psi)	**3 C B**
0 ... 25 bar (0 ... 363 psi)	-1 bar (-14.5 psi)	62.5 bar (906 psi)	> 62,5 bar (> 906 psi)	**3 C D**
0 ... 40 bar (0 ... 580 psi)	-1 bar (-14.5 psi)	100 bar (1450 psi)	> 100 bar (> 1450 psi)	**3 C E**
0 ... 60 bar (0 ... 870 psi)	-1 bar (-14.5 psi)	150 bar (2175 psi)	> 150 bar (> 2175 psi)	**3 C G**
Other version, add order code and plain text: Measuring range: ... up to... bar (psi)				**9 A A** **H 1 Y**
For absolute pressure				
0 ... 600 bar a (0 ... 8.7 psia)	0 bar a (0 psia)	3 bar a (43.51 psia)	> 2,5 bar a (> 36.3 psia)	**5 A G**
0 ... 1 bar a (0 ... 14.5 psia)	0 bar a (0 psia)	2.5 bar a (36.26 psia)	> 2,5 bar a (> 36.3 psia)	**5 B A**
0 ... 1.6 bar a (0 ... 23.2 psia)	0 bar a (0 psia)	4 bar a (58.02 psia)	> 4 bar a (> 58.0 psia)	**5 B B**
0 ... 2.5 bar a (0 ... 36.3 psia)	0 bar a (0 psia)	6.25 bar a (90.65 psia)	> 6,25 bar a (> 90.7 psia)	**5 B D**
0 ... 4 bar a (0 ... 58.0 psia)	0 bar a (0 psia)	10 bar a (145 psia)	> 10 bar a (> 145 psia)	**5 B E**
0 ... 6 bar a (0 ... 87.0 psia)	0 bar a (0 psia)	15 bar a (217 psia)	> 15 bar a (> 217 psia)	**5 B G**
0 ... 10 bar a (0 ... 145 psi)	0 bar a (0 psia)	25 bar a (362 psia)	> 25 bar a (> 362 psia)	**5 C A**
0 ... 16 bar a (0 ... 232 psi)	0 bar a (0 psia)	40 bar a (580 psia)	> 40 bar a (> 580 psia)	**5 C B**
Other version, add order code and plain text: Measuring range: ... up to ... mbar a (psia)				**9 A A** **H 1 Y**
Measuring ranges for gauge pressure (only for US market)				
(0 ... 15 psi)	(-5.8 psi)	(35 psi)	(> 35 psi)	**4 B B**
(3 ... 15 psi)	(-5.8 psi)	(35 psi)	(> 35 psi)	**4 B C**
(0 ... 20 psi)	(-5.8 psi)	(50 psi)	(> 50 psi)	**4 B D**
(0 ... 30 psi)	(-5.8 psi)	(80 psi)	(> 80 psi)	**4 B E**
(0 ... 60 psi)	(-11.5 psi)	(140 psi)	(> 140 psi)	**4 B F**
(0 ... 100 psi)	(-14.5 psi)	(200 psi)	(> 200 psi)	**4 B G**
(0 ... 150 psi)	(-14.5 psi)	(350 psi)	(> 350 psi)	**4 C A**
(0 ... 200 psi)	(-14.5 psi)	(550 psi)	(> 550 psi)	**4 C B**
(0 ... 300 psi)	(-14.5 psi)	(800 psi)	(> 800 psi)	**4 C D**
(0 ... 500 psi)	(-14.5 psi)	(1400 psi)	(> 1400 psi)	**4 C E**
(0 ... 750 psi)	(-14.5 psi)	(2000 psi)	(> 2000 psi)	**4 C F**
(0 ... 1000 psi)	(-14.5 psi)	(2000 psi)	(> 2000 psi)	**4 C G**
Other version, add order code and plain text: Measuring range: ... up to ... psi				**9 A A** **H 1 Y**
Measuring ranges for absolute pressure (only for US market)				
(0 ... 10 psia)	(0 psia)	(35 psia)	(> 35 psia)	**6 A G**
(0 ... 15 psia)	(0 psia)	(35 psia)	(> 35 psia)	**6 B A**
(0 ... 20 psia)	(0 psia)	(50 psia)	(> 50 psia)	**6 B B**
(0 ... 30 psia)	(0 psia)	(80 psia)	(> 80 psia)	**6 B D**
(0 ... 60 psia)	(0 psia)	(140 psia)	(> 140 psia)	**6 B E**
(0 ... 100 psia)	(0 psia)	(200 psia)	(> 200 psia)	**6 B G**
(0 ... 150 psia)	(0 psia)	(350 psia)	(> 350 psia)	**6 C A**
(0 ... 200 psia)	(0 psia)	(550 psia)	(> 550 psia)	**6 C B**
(0 ... 300 psia)	(0 psia)	(800 psia)	(> 800 psia)	**6 C C**
Other version, add order code and plain text: Measuring range: ... up to ... psia				**9 A A** **H 1 Y**

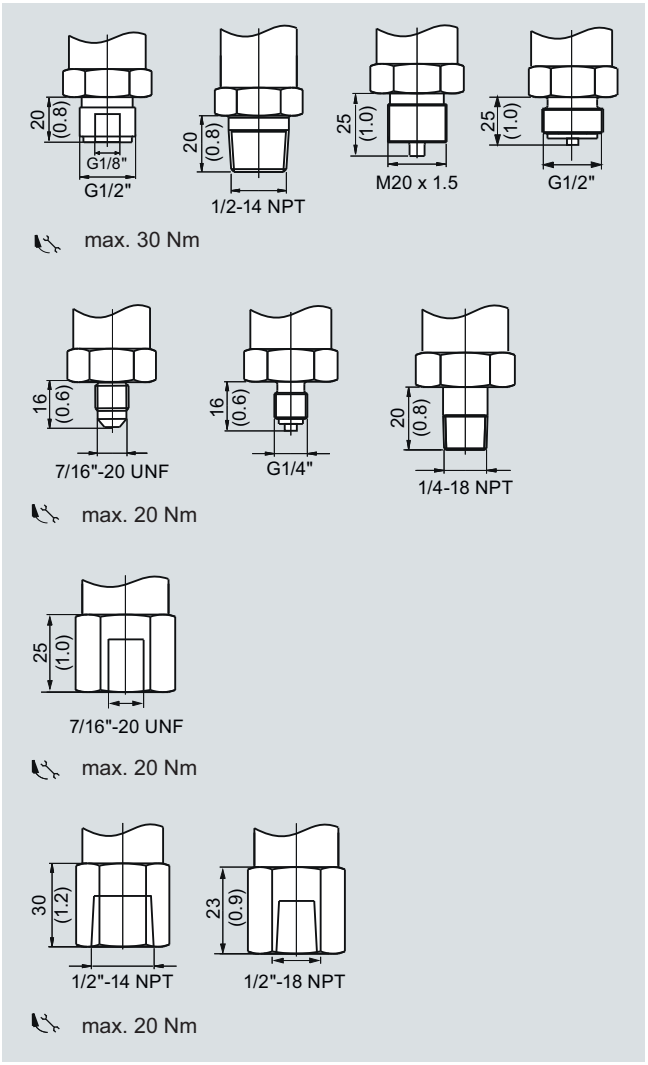
Selection and Ordering data		Order No.											Order code		
SITRANS P200 pressure transmitters for pressure and absolute pressure for general applications Accuracy typ. 0.25 % Wetted parts materials: Ceramic and stainless steel + sealing material Non-wetted parts materials: stainless steel	D)	**7MF1565-**	■	■	■	■	**-**	■	■	■	■		■	■	■
Output signal															
4 ... 20 mA; two-wire system; power supply 7 ... 33 V DC (10 ... 30 V DC for ATEX versions)					**0**										
0 ... 10 V; three-wire system; power supply 12 ... 33 V DC					**1**	**0**									
Explosion protection (only 4 ... 20 mA)															
None						**0**									
With explosion protection EEx ia IIC T4						**1**									
Electrical connection															
Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling)								**1**							
Round connector M12 per DIN EN 60139-9 (not for gauge pressure ranges ≤ 16 bar)								**2**							
Connection via fixed mounted cable, 2m (not for type of protection "Intrinsic safety i")					**0**			**3**							
Cable quick screw connection PG9 (not for type of protection "Intrinsic safety i")					**0**			**4**							
Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)								**5**							
Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling)								**6**							
Special version								**9**					**N**	**1**	**Y**
Process connection															
G½" male per EN 837-1 (½" BSP male) (standard for metric pressure ranges mbar, bar)									**A**						
G½" male thread and G1/8" female thread									**B**						
G¼" male per EN 837-1 (¼" BSP male)									**C**						
7/16"-20 UNF male									**D**						
¼"-18 NPT male (standard for pressure ranges inH_2O and psi)									**E**						
¼"-18 NPT female									**F**						
½"-14 NPT male									**G**						
½"-14 NPT female									**H**						
7/16"-20 UNF female									**J**						
M20x1.5 male									**P**						
Special version									**Z**				**P**	**1**	**Y**
Sealing material between sensor and enclosure															
Viton (FPM, standard)										**A**					
Neoprene (CR)										**B**					
Perbunan (NBR)										**C**					
EPDM										**D**					
Special version										**Z**			**Q**	**1**	**Y**
Version															
Standard version											**1**				
Further designs															
Supplement the order no. with "**-Z**" and add order code.															
Manufacturer's test certificate M per DIN 55340, Part 18 and ISO 8402 (calibration certificate) supplied		**C11**													
Oxygen application, oil and grease-free cleaning (only in conjunction with the sealing material Viton between sensor and enclosure)		**E10**													

D) Subject to export regulations AL: N, ECCN: EAR99H.

Dimensional drawings

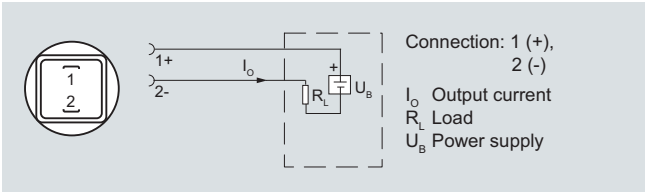


SITRANS P200, electrical connections, dimensions in mm (inch)

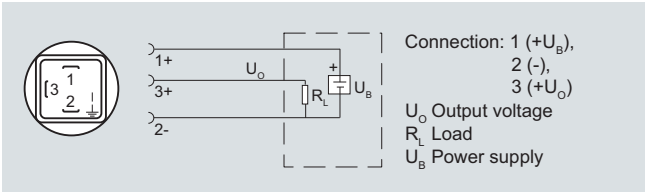


SITRANS P200, process connections, dimensions in mm (inch)

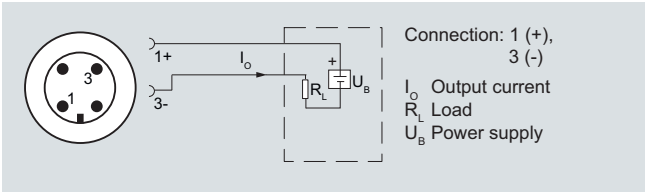
Schematics



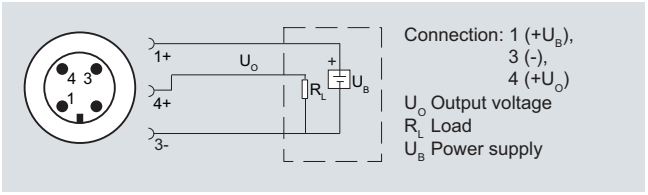
Connection with current output and connector per EN 175301



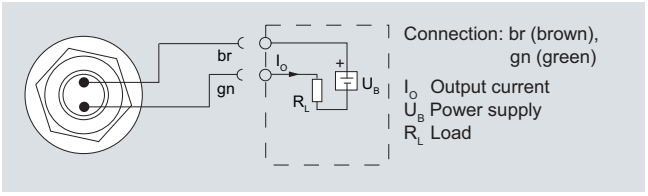
Connection with voltage output and connector per EN 175301



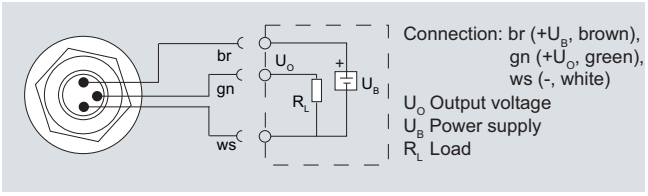
Connection with current output and connector M12x1



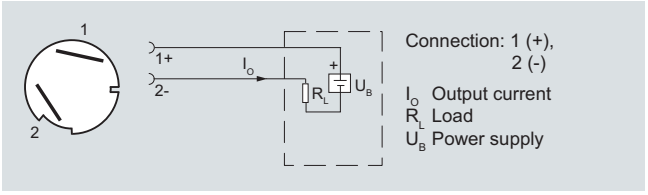
Connection with voltage output and connector M12x1



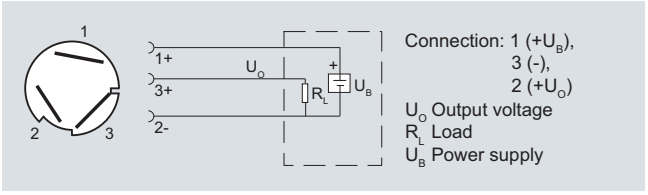
Connection with current output and cable



Connection with voltage output and cable



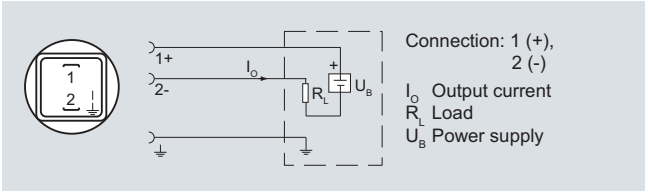
Connection with current output and cable quick screw connection



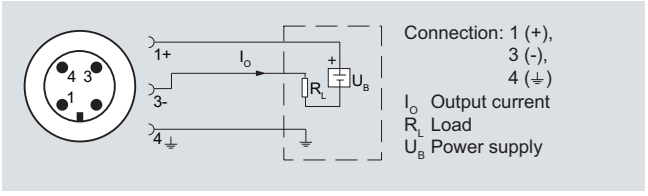
Connection with voltage output and cable quick screw connection

Version with explosion protection: 4 ... 20 mA

The grounding connection is conductively bonded to the transmitter enclosure



Connection with current output and connector per EN 175301 (Ex)



Connection with current output and connector M12x1 (Ex)

SITRANS P210
for gauge pressure

Overview

The pressure transmitter SITRANS P210 measures the gauge pressure of liquids, gases and vapors.

- Stainless steal measuring cell
- Measuring ranges 100 to 600 mbar (1.45 to 8.7 psi) relative
- For low-pressure applications

Benefits

- High measuring accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapors
- Compact design

Application

The pressure transmitter SITRANS P210 for gauge pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

Design

Device structure without explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a round plug M12 (IP67), a cable (IP67) or a cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

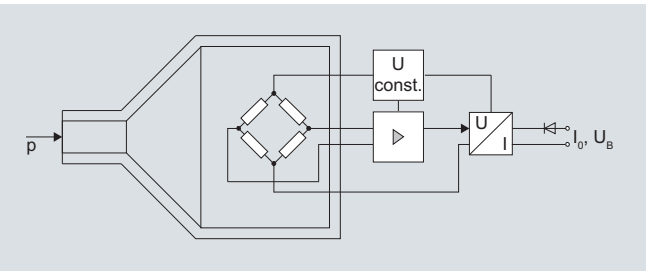
Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65) or a round plug M12 (IP67) connected electrically. The output signal is between 4 and 20 mA.

Function

The pressure transmitter measures the gauge pressure of liquids and gases as well as the level of liquids.

Mode of operation



SITRANS P210 pressure transmitters (7MF1566-...), functional diagram

The stainless steel measuring cell has a thin-film resistance bridge to which the operating pressure p is transmitted through a stainless steel diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

Technical specifications

Application	
Gauge measurement	Liquids, gases and vapors
Mode of operation	
Measuring principle	Piezoresistive measuring cell (stainless steel diaphragm)
Measured variable	Gauge pressure
Inputs	
Measuring range	
• Gauge pressure	100 … 600 mbar (1.5 … 8.7 psi)
Output	
Current signal	4 ... 20 mA
• Load	(U_B - 10 V) / 0.02 A
• Auxiliary power U_B	DC 7 ... 33 V (10 ... 30 V for Ex)
Voltage signal	0 ... 10 V DC
• Load	≥ 10 kΩ
• Auxiliary power U_B	12 ... 33 V DC
• Power consumption	< 7 mA at 10 kΩ
Characteristic curve	Linear rising
Measuring accuracy	
Error in measurement at limit setting incl. hysteresis and reproducibility	• Typical: 0.25 % of full-scale value • Maximum: 0.5 % of full-scale value
Step response time T_{99}	< 5 ms
Long-term stability	
• Lower range value and measuring span	0.25 % of full-scale value/year
Influence of ambient temperature	
• Lower range value and measuring span	• 0.25 %/10 K of full-scale value • 0.5 %/10K of full-scale value for a measuring range 100 … 400 mbar
• Influence of power supply	0.005 %/V
Conditions of use	
Process temperature with gasket made of:	
• FPM (Standard)	-15 ... +125 °C (+5 ... +257 °F)
• Neoprene	-35 ... +100 °C (-31 ... +212 °F)
• Perbunan	-20 ... +100 °C (-4 ... +212 °F)
• EPDM	-40 ... +145 °C (-40 ... +293 °F), usable for drinking water
Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
Storage temperature	-50 ... +100 °C (-58 ... +212 °F)
Degree of protection (to EN 60529)	• IP 65 with connector per EN 175301-803-A • IP 67 with M12 connector • IP 67 with cable • IP 67 with cable quick screw connection
Electromagnetic compatibility	• acc. EN 61326-1/-2/-3 • acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation ≤ 1 %
Mounting position	upright

Design	
Weight	Approx. 0.090 kg (0.198 lb)
Process connections	See dimensional drawings
Electrical connections	• Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or ½-14 NPT or Pg 11 • M12 connector • 2 or 3-wire (0.5 mm^2) cable (∅ ± 5.4 mm) • Cable quick screw connection
Wetted parts materials	
• Measuring cell	Stainless steel, mat.-No. 1.4435
• Process connection	Stainless steel, mat. No. 1.4404 (SST 316 L)
• Gasket	• FPM (Standard) • Neoprene • Perbunan • EPDM
Non-wetted parts materials	
• Enclosure	Stainless steel, mat. No. 1.4404 (SST 316 L)
• Rack	Plastic
• cables	PVC
Certificates and approvals	
Classification according to pressure equipment directive (PED 97/23/EC)	For gases of fluid group 1 and liquids of fluid group 1; meets requirements as per article 3, paragraph 3 (good engineering practice)
Lloyds Register of Shipping (LR)	Applied
Germanischer Lloyds Register of Shipping (GL)	Applied
American Bureau of Shipping (ABS)	Applied
Bureau Veritas (BV)	Applied
Det Norske Veritas (DNV)	Applied
Drinking water approval (ACS)	Applied
GOST	Applied
Explosion protection	
Intrinsic safety "i" (only with current output)	Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db
EC type-examination certificate	SEV 10 ATEX 0146
Connection to certified intrinsically-safe resistive circuits with maximum values:	U_i ≤ 30 V DC; I_i ≤ 100 mA; P_i ≤ 0.75 W
Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	L_i = 0 nH; C_i = 0 nF

SITRANS P210
for gauge pressure

Selection and Ordering data — Order No. — Order code

SITRANS P210 pressure transmitters for gauge pressure for low pressure applications — D) **7MF1566 -** ■■■■ - ■■■■ ■■■

Accuracy typ. 0.25 %

Wetted parts materials: Stainless steel + sealing material

Non-wetted parts materials: stainless steel

Measuring range	Overload limit min.	Overload limit max.	Burst pressure		
For gauge pressure					
0 ... 100 mbar (0.58 psi)	-40 mbar (-0.58 psi)	250 mbar (3.63 psi)	0.5 bar (7.25 psi)		**3 A A**
0 ... 160 mbar (2.32 psi)	-40 mbar (-0.58 psi)	400 mbar (5.8 psi)	0.5 bar (7.25 psi)		**3 A B**
0 ... 250 mbar (3.63 psi)	-80 mbar (-1.16 psi)	625 mbar (9.06 psi)	1 bar (14.5 psi)		**3 A C**
0 ... 400 mbar (5.8 psi)	-80 mbar (-1.16 psi)	1000 mbar (14.5 psi)	1 bar (14.5 psi)		**3 A D**
0 ... 600 mbar (8.7 psi)	-100 mbar (-1.45 psi)	1500 mbar (21.76 psi)	2.5 bar (36.26 psi)		**3 A G**
Other version, add order code and plain text: Measuring range: ... up to ... mbar (psi)					**9 A A** **H 1 Y**

Output signal

4 ... 20 mA; two-wire system; power supply 7 ... 33 V DC (10 ... 30 V DC for ATEX versions)	**0**
0 ... 10 V; three-wire system; power supply 12 ... 33 V DC	**1 0**

Explosion protection (only 4 ... 20 mA)

None	**0**
With explosion protection EEx ia IIC T4	**1**

Electrical connection

Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling)	**1**
Round connector M12 per DIN EN 60139-9 (not for gauge pressure ranges ≤ 16 bar)	**2**
Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i")	**0 3**
Cable quick screw connection PG9 (not for type of protection "Intrinsic safety i")	**0 4**
Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)	**5**
Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling)	**6**
Special version	**9** **N 1 Y**

Process connection

G½" male per EN 837-1 (½" BSP male) (standard for metric pressure ranges mbar, bar)	**A**
G½" male thread and G1/8" female thread	**B**
G¼" male per EN 837-1 (¼" BSP male)	**C**
7/16"-20 UNF male	**D**
¼"-18 NPT male (standard for pressure ranges in H_2O and psi)	**E**
¼"-18 NPT female	**F**
½"-14 NPT male	**G**
½"-14 NPT female	**H**
7/16"-20 UNF female	**J**
M20x1.5 male	**P**
Special version	**Z** **P 1 Y**

Sealing material between sensor and enclosure

Viton (FPM, standard)	**A**
Neoprene (CR)	**B**
Perbunan (NBR)	**C**
EPDM	**D**
Special version	**Z** **Q 1 Y**

Version

Standard version	**1**

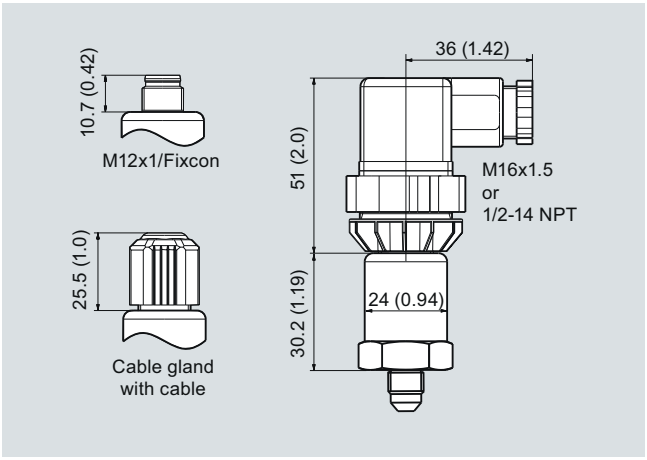
Further designs

Supplement the order no. with "**-Z**" and add order code.

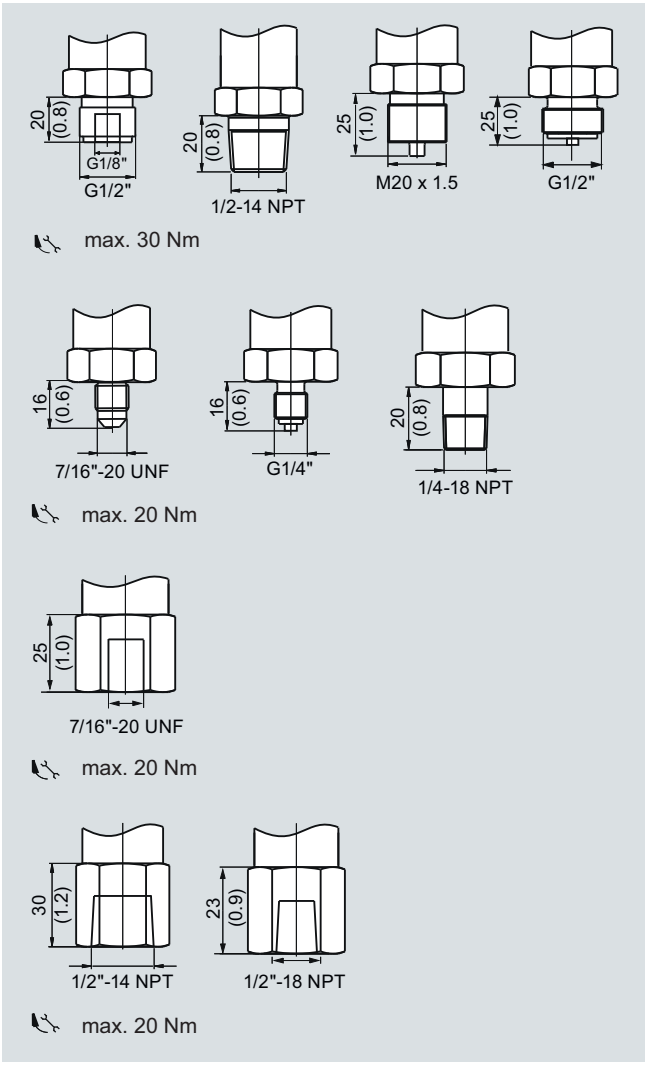
Manufacturer's test certificate M per DIN 55340, Part 18 and ISO 8402 (calibration certificate) supplied — **C11**

D) Subject to export regulations AL: N, ECCN: EAR99H.

Dimensional drawings

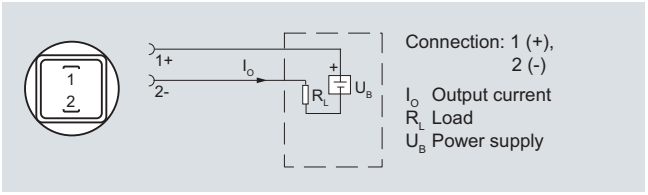


SITRANS P210, electrical connections, dimensions in mm (inch)

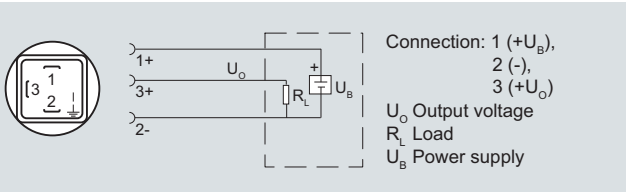


SITRANS P210, process connections, dimensions in mm (inch)

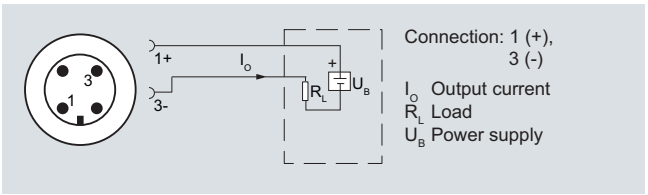
Schematics



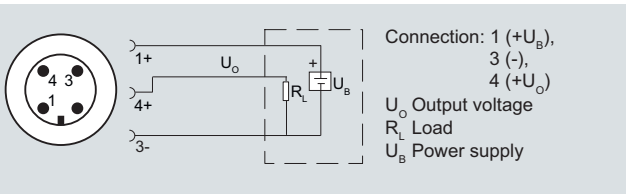
Connection with current output and connector per EN 175301



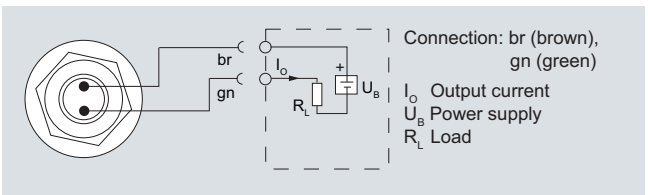
Connection with voltage output and connector per EN 175301



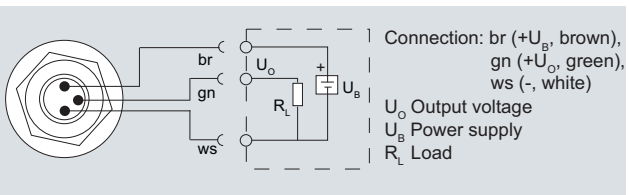
Connection with current output and connector M12x1



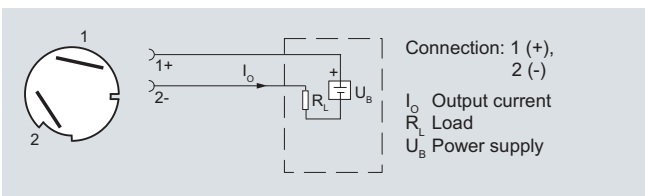
Connection with voltage output and connector M12x1



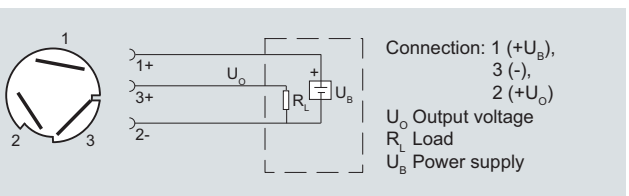
Connection with current output and cable



Connection with voltage output and cable



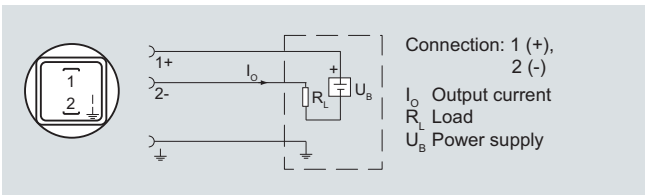
Connection with current output and cable quick screw connection



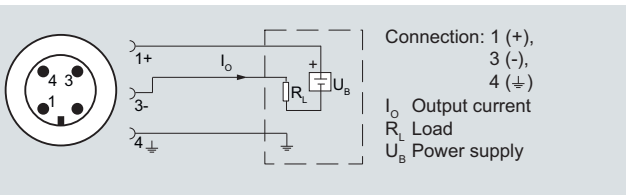
Connection with voltage output and cable quick screw connection

Version with explosion protection: 4 ... 20 mA

The grounding connection is conductively bonded to the transmitter enclosure



Connection with current output and connector per EN 175301 (Ex)



Connection with current output and connector M12x1 (Ex)

Overview

The pressure transmitter SITRANS P220 measures the gauge pressure of liquids, gases and vapors.

- Stainless steel measuring cell, fully welded
- Measuring ranges 2.5 to 600 bar (36.3 to 8702 psi) relative
- For high-pressure applications and refrigeration technology division

Benefits

- High measuring accuracy
- Rugged stainless steel enclosure
- High overload withstand capability
- For aggressive and non-aggressive media
- For measuring the pressure of liquids, gases and vapors
- Compact design
- Gasket-less

Application

The pressure transmitter SITRANS P220 for gauge pressure is used in the following industrial areas:

- Mechanical engineering
- Shipbuilding
- Power engineering
- Chemical industry
- Water supply

Design

Device structure without explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65), a round plug M12 (IP67), a cable (IP67) or a cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

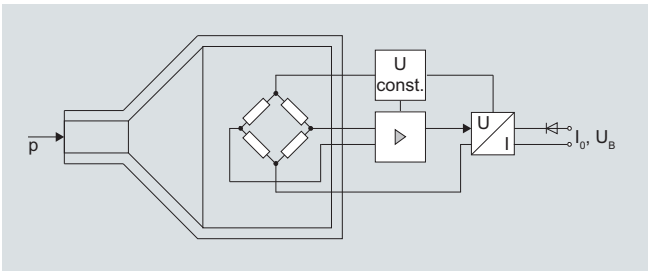
Device structure with explosion protection

The pressure transmitter consists of a piezoresistive measuring cell with a diaphragm installed in a stainless steel enclosure. It can be used with a connector per EN 175301-803-A (IP65) or a round plug M12 (IP67) connected electrically. The output signal is between 4 and 20 mA.

Function

The pressure transmitter measures the gauge pressure of liquids and gases as well as the level of liquids.

Mode of operation



SITRANS P220 pressure transmitters (7MF1567-...), functional diagram

The stainless steel measuring cell has a thick-film resistance bridge to which the operating pressure p is transmitted through a stainless steel diaphragm.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

SITRANS P220 for gauge pressure

Technical specifications

Application	
Gauge pressure measurement	Liquids, gases and vapors
Mode of operation	
Measuring principle	Piezoresistive measuring cell (stainless steel diaphragm)
Measured variable	Gauge pressure
Inputs	
Measuring range	
• Gauge pressure	
- Metric	2.5 … 600 bar (36 … 8700 psi)
- US measuring range	30… 8700 psi
Output	
Current signal	4 ... 20 mA
• Load	(U_B - 10 V) / 0.02 A
• Auxiliary power U_B	DC 7 ... 33 V (10 ... 30 V for Ex)
Voltage signal	0 ... 10 V DC
• Load	≥ 10 kΩ
• Auxiliary power U_B	12 ... 33 V DC
• Power consumption	< 7 mA at 10 kΩ
Characteristic curve	Linear rising
Measuring accuracy	
Error in measurement at limit setting incl. hysteresis and reproducibility	• Typical: 0.25 % of full-scale value • Maximum: 0.5 % of full-scale value
Step response time T_{99}	< 5 ms
Long-term stability	
• Lower range value and measuring span	0.25 % of full-scale value/year
Influence of ambient temperature	
• Lower range value and measuring span	0.25 %/10 K of full-scale value
• Influence of power supply	0.005 %/V
Conditions of use	
• Process temperature	-30 ... +120 °C (-22 ... +248 °F)
• Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)
• Storage temperature	-50 ... +100 °C (-58 ... +212 °F)
• Degree of protection (to EN 60529)	• IP 65 with connector per EN 175301-803-A • IP 67 with M12 connector • IP 67 with cable • IP 67 with cable quick screw connection
Electromagnetic compatibility	• acc. EN 61326-1/-2/-3 • acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation ≤ 1 %

Design	
Weight	Approx. 0.090 kg (0.198 lb)
Process connections	See dimensional drawings
Electrical connections	• Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or ½-14 NPT or Pg 11 • M12 connector • 2 or 3-wire (0.5 mm^2) cable (∅ ± 5.4 mm) • Cable quick screw connection
Wetted parts materials	
• Measuring cell	Stainless steel, mat.-No. 1.4016
• Process connection	Stainless steel, mat. No. 1.4404 (SST 316 L)
Non-wetted parts materials	
• Enclosure	Stainless steel, mat. No. 1.4404 (SST 316 L)
• Rack	Plastic
• cables	PVC
Certificates and approvals	
Classification according to pressure equipment directive (PED 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)
Lloyds Register of Shipping (LR)	Applied
Germanischer Lloyds Register of Shipping (GL)	Applied
American Bureau of Shipping (ABS)	Applied
Bureau Veritas (BV)	Applied
Det Norske Veritas (DNV)	Applied
Drinking water approval (ACS)	Applied
GOST	Applied
Explosion protection	
Intrinsic safety "i" (only with current output)	Ex II 1/2 G Ex ia IIC T4 Ga/Gb Ex II 1/2 D Ex ia IIIC T125 °C Da/Db
EC type-examination certificate	SEV 10 ATEX 0146
Connection to certified intrinsically-safe resistive circuits with maximum values:	U_i ≤ 30 V DC; I_i ≤ 100 mA; P_i ≤ 0.75 W
Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	L_i = 0 nH; C_i = 0 nF

Selection and Ordering data

Order No. Order code

SITRANS P220 pressure transmitters for gauge pressure, high-pressure and refrigeration applications, fully-welded version D) 7MF1567 - ■■■■■ - ■■ A ■ ■■■
Accuracy typ. 0.25 %

Wetted parts materials: stainless steel

Non-wetted parts materials: stainless steel

Measuring range		Overload limit Minimum		Overload limit Max.		Burst pressure		
For gauge pressure								
0 ... 2.5 bar	(0 ... 36.3 psi)	-0.8 bar	(-11.6 psi)	6.25 bar	(90.7 psi)	25 bar	(363 psi)	3 B D
0 ... 4 bar	(0 ... 58 psi)	-0.8 bar	(-11.6 psi)	10 bar	(145 psi)	40 bar	(870 psi)	3 B E
0 ... 6 bar	(0 ... 87 psi)	-1 bar	(-14.5 psi)	15 bar	(217 psi)	60 bar	(522 psi)	3 B G
0 ... 10 bar	(0 ... 145 psi)	-1 bar	(-14.5 psi)	25 bar	(362 psi)	60 bar	(870 psi)	3 C A
0 ... 16 bar	(0 ... 232 psi)	-1 bar	(-14.5 psi)	40 bar	(580 psi)	96 bar	(1392 psi)	3 C B
0 ... 25 bar	(0 ... 363 psi)	-1 bar	(-14.5 psi)	62.5 bar	(906 psi)	150 bar	(2176 psi)	3 C D
0 ... 40 bar	(0 ... 580 psi)	-1 bar	(-14.5 psi)	100 bar	(1450 psi)	240 bar	(3481 psi)	3 C E
0 ... 60 bar	(0 ... 870 psi)	-1 bar	(-14.5 psi)	150 bar	(2175 psi)	360 bar	(5221 psi)	3 C G
0 ... 100 bar	(0 ... 1450 psi)	-1 bar	(-14.5 psi)	250 bar	(3625 psi)	600 bar	(8702 psi)	3 D A
0 ... 160 bar	(0 ... 2320 psi)	-1 bar	(-14.5 psi)	400 bar	(5801 psi)	960 bar	(13924 psi)	3 D B
0 ... 250 bar	(0 ... 3625 psi)	-1 bar	(-14.5 psi)	625 bar	(9064 psi)	1500 bar	(21756 psi)	3 D D
0 ... 400 bar	(0 ... 5801 psi)	-1 bar	(-14.5 psi)	1000 bar	(14503 psi)	2400 bar	(34809 psi)	3 D E
0 ... 600 bar	(0 ... 8702 psi)	-1 bar	(-14.5 psi)	1500 bar	(21755 psi)	2500 bar	(36260 psi)	3 D G
Other version, add order code and plain text: Measuring range: ... up to... bar (psi)								9 A A ... H1Y

Measuring ranges for gauge pressure (only for US market)					
(0 ... 30 psi)	(-5.8 psi)	(75 psi)	(360 psi)	4 B E
(0 ... 60 psi)	(-11.5 psi)	(150 psi)	(580 psi)	4 B F
(0 ... 100 psi)	(-14.5 psi)	(250 psi)	(580 psi)	4 B G
(0 ... 150 psi)	(-14.5 psi)	(375 psi)	(870 psi)	4 C A
(0 ... 200 psi)	(-14.5 psi)	(500 psi)	(1390 psi)	4 C B
(0 ... 300 psi)	(-14.5 psi)	(750 psi)	(2170 psi)	4 C D
(0 ... 500 psi)	(-14.5 psi)	(1250 psi)	(3480 psi)	4 C E
(0 ... 750 psi)	(-14.5 psi)	(1875 psi)	(5220 psi)	4 C F
(0 ... 1000 psi)	(-14.5 psi)	(2500 psi)	(5220 psi)	4 C G
(0 ... 1500 psi)	(-14.5 psi)	(3750 psi)	(8700 psi)	4 D A
(0 ... 2000 psi)	(-14.5 psi)	(5000 psi)	(13920 psi)	4 D B
(0 ... 3000 psi)	(-14.5 psi)	(7500 psi)	(21750 psi)	4 D D
(0 ... 5000 psi)	(-14.5 psi)	(12500 psi)	(34800 psi)	4 D E
(0 ... 6000 psi	(-14.5 psi)	(15000 psi)	(34800 psi)	4 D F
(0 ... 8700 psi)	(-14.5 psi)	(21000 psi)	(52200 psi)	4 D G
Other version, add order code and plain text: Measuring range: ... up to ... psi				9 A A ... H1Y

Output signal

4 ... 20 mA; two-wire system; power supply 7 ... 33 V DC (10 ... 30 V DC for ATEX versions)	0
0 ... 10 V; three-wire system; power supply 12 ... 33 V DC	1 0

Explosion protection (only 4 ... 20 mA)

None	0
With explosion protection EEx ia IIC T4	1

Electrical connection

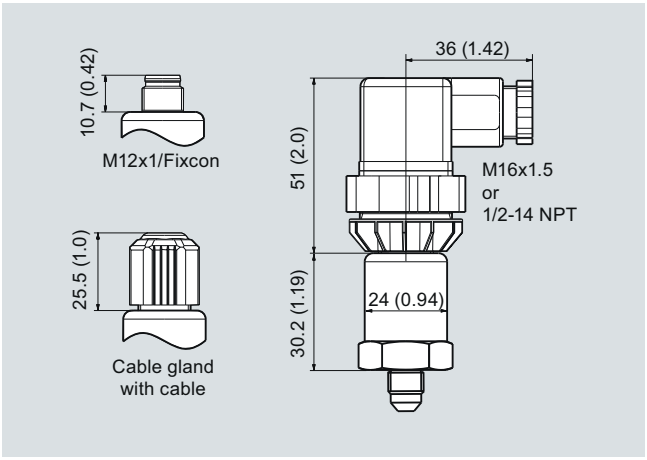
Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling)	1
Round connector M12 per DIN EN 60139-9 (not for gauge pressure ranges ≤ 16 bar)	2
Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i")	0 3
Cable quick screw connection PG9 (not for type of protection "Intrinsic safety i")	0 4
Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)	5
Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling)	6
Special version	9 ... N1Y

SITRANS P220 for gauge pressure

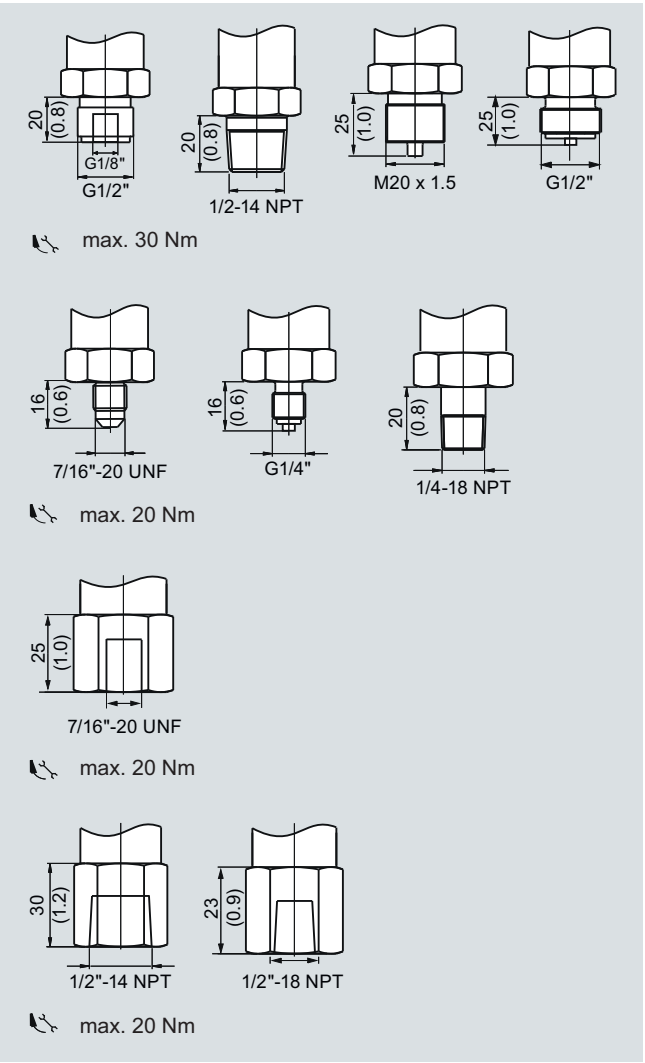
Selection and Ordering data		Order No.	Order code
SITRANS P220 pressure transmitters for gauge pressure, high-pressure and refrigeration applications, fully-welded version	D)	**7MF1567 -** ■■■■■ **-** ■■	**A** ■ ■■■
Accuracy typ. 0.25 %			
Wetted parts materials: stainless steel			
Non-wetted parts materials: stainless steel			
Process connection			
G½" male per EN 837-1 (½" BSP male) (standard for metric pressure ranges mbar, bar)			**A**
G½" male thread and G1/8" female thread			**B**
G¼" male per EN 837-1 (¼" BSP male)			**C**
7/16"-20 UNF male			**D**
¼"-18 NPT male (standard for pressure ranges inH_2O and psi)			**E**
¼"-18 NPT female (Only for measuring ranges ≤ 60 bar (870 psi))			**F**
½"-14 NPT male			**G**
½"-14 NPT female (Only for measuring ranges ≤ 60 bar (870 psi))			**H**
7/16"-20 UNF female			**J**
M20x1.5 male			**P**
Special version			**Z** **P 1 Y**
Version			
Standard version			**1**
Further designs			
Supplement the order no. with "**-Z**" and add order code.			
Manufacturer's test certificate M per DIN 55340, Part 18 and ISO 8402 (calibration certificate) supplied		**C11**	
Oxygen application, oil and grease-free cleaning		**E10**	

D) Subject to export regulations AL: N, ECCN: EAR99H.

Dimensional drawings



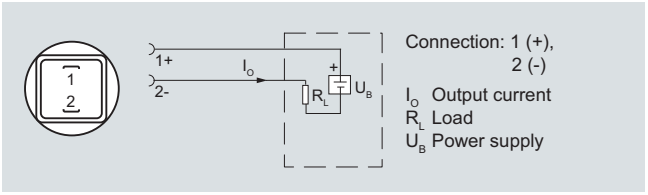
SITRANS P220, electrical connections, dimensions in mm (inch)



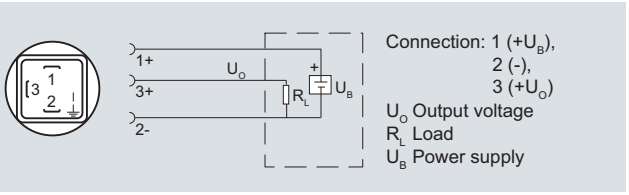
SITRANS P220, process connections, dimensions in mm (inch)

SITRANS P220
for gauge pressure

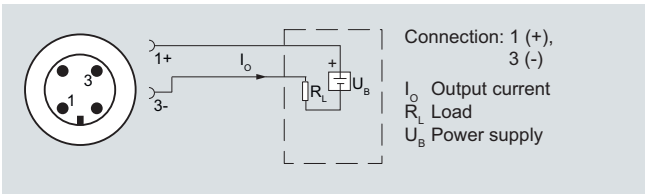
Schematics



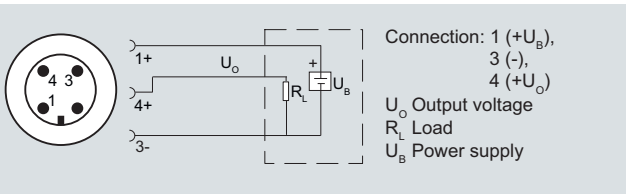
Connection with current output and connector per EN 175301



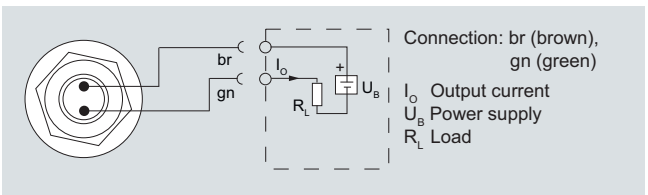
Connection with voltage output and connector per EN 175301



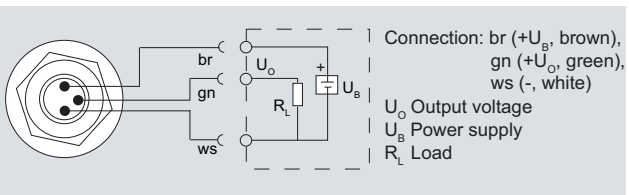
Connection with current output and connector M12x1



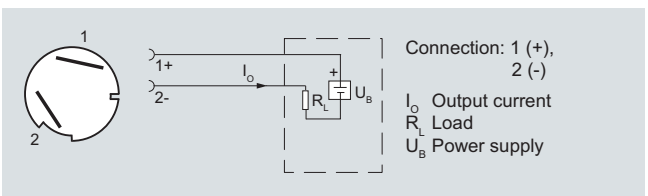
Connection with voltage output and connector M12x1



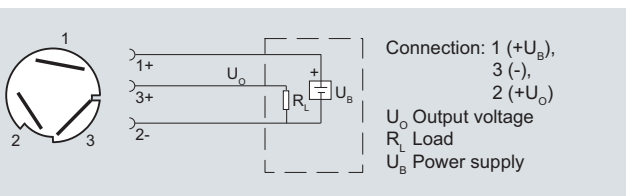
Connection with current output and cable



Connection with voltage output and cable



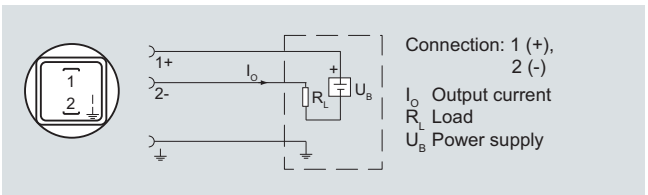
Connection with current output and cable quick screw connection



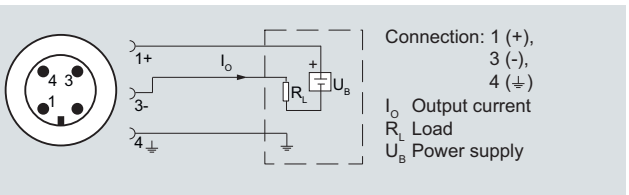
Connection with voltage output and cable quick screw connection

Version with explosion protection: 4 ... 20 mA

The grounding connection is conductively bonded to the transmitter enclosure

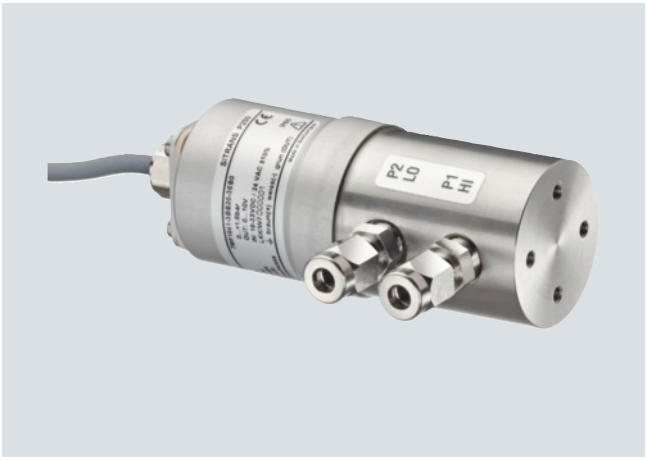


Connection with current output and connector per EN 175301 (Ex)



Connection with current output and connector M12x1 (Ex)

Overview



The SITRANS P250 transmitter measures the differential pressure of liquids and gases.

Benefits

- High measuring accuracy
- Sturdy stainless steel enclosure
- For aggressive and non-aggressive media
- For the measurement of the differential pressure of liquids and gases
- Temperature-compensated measuring cell
- Compact design

Application

The SITRANS P250 transmitter for differential pressure is primarily used in the following industries:

- Chemical industry
- Heating, ventilation and air conditioning technology
- Food industry
- Mechanical engineering
- Shipbuilding
- Water supply

Design

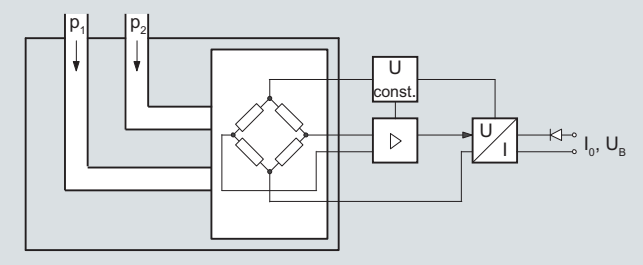
Main components:

- Stainless steel enclosure with piezo-resistive ceramic measuring cell (temperature-compensated) and electronics module
- Process connection made of stainless steel in diverse designs (see Selection and Ordering data)
- Electrical connection through connectors acc. to EN 175301-803-A and round connectors M12, as well as with permanently fixed cable

Function

The pressure transmitter measures the differential pressure of liquids and gases.

Mode of operation



SITRANS P250 pressure transmitter, function diagram

The piezo-resistive measuring cell (ceramic membrane) has a Wheatstone bridge circuit, on which the operating pressure P1 and P2 of the media acts at both ends.

The voltage output from the measuring cell is converted by an amplifier into an output current of 4 to 20 mA or an output voltage of 0 to 5 or 10 V DC.

The output current and voltage are linearly proportional to the input pressure.

Technical specifications

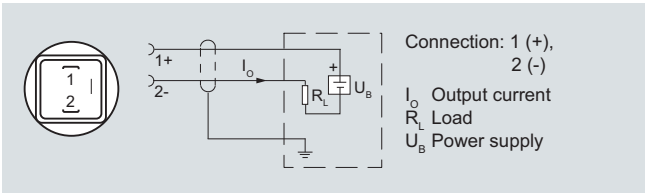
SITRANS P250 differential pressure transmitter	
Application	
Differential pressure transmitter	Liquids and neutral gases
Mode of operation	
Measuring principle	Piezo-resistive measuring cell (ceramic diaphragm)
Input	
Measured variable	Differential pressure
Measuring range	0 ... 0.1 to 0 ... 25 bar (0 ... 1.45 to 0 ... 363 psi)
Operating pressure	≤ 25 bar at a differential pressure range > 6 bar ≤ 50 bar at a differential pressure range > 10 bar
Burst pressure	1.5 x operating pressure
Output	
Output signal	
• Current output signal	4 ... 20 mA
• Voltage output signal	0 ... 5 V DC and 0 ... 10 V DC
Load	
• 3-wire	> 10 kΩ
• 2-wire	≤ (U_H - 11 V) / 0.02 A
Measuring accuracy	
Error in measurement at limit setting incl. hysteresis and reproducibility	≤ 1 % of typical full-scale value, see "Measuring range" table
Long-term stability acc. to IEC 60770	≤ 0.5 % of full-scale value/year
Influence of ambient temperature	
• Start of scale	≤ 0.6 %/10 K of full-scale value (≤ 1.2 % / 10K for measuring cell 0 ... 0.1 bar (1.45 psi))
• Full-scale value	≤ 0.22 %/10 K of full-scale value (≤ 0.37 % / 10K for measuring cell 0 ... 0.1 bar (1.45 psi))
Dynamic behavior	Suitable for static and dynamic measurements
Response time T_{99}	< 5 ms
Load variation	< 50 Hz

SITRANS P250
for differential pressure

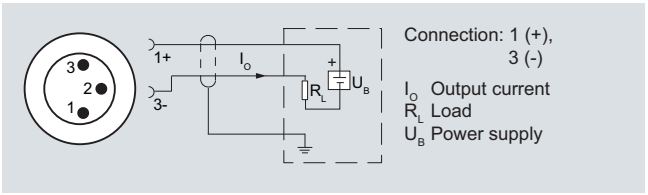
Rated conditions	
Ambient conditions	
• Temperature of medium	-15 ...+85 °C (5 ... 185 °F)
• Ambient temperature	-15 ...+85 °C (5 ... 185 °F)
• Storage temperature	-40 ...+85 °C (-40 ... +185 °F)
Degree of protection acc. to EN 60529	IP65
Mounting position	Any
Mounting	Mounting bracket, included in delivery
Design	
Weight	Approx. 430 g (approx. 0.95 lb)
Enclosure material	Stainless steel 1.4305/AISI 303
Electrical connection	• Plug EN 175301-803-A • Circular plug EN 60130-9 • Cable 1.5 m
Process connection	• Hose sleeve Ø 4 mm/6 mm • Pipe union Ø 6 mm/8 mm • Male thread 7/16-20 UNF, G1/8" • Female thread 1/8-27 NPT • (Standard), G1/8"
Wetted parts materials	
• Process connection	Stainless steel 1.4305/AISI 303, CuZn nickel-plated
• Diaphragm	Ceramic Al_2O_3 (96 %)
• Sealing material	FPM (standard), EPDM, NBR, MVQ, CR
Power supply U_H	
Terminal voltage on pressure transmitter	
• 2-wire, 4 ... 20 mA	11 ... 33 V DC
• 3-wire, 0 ... 5 V DC	11 ... 33 V DC/ 24 V AC ±15 %
• 3-wire, 0 ... 10 V DC	18 ... 33 V DC/ 24 V AC ±15 %
Current consumption at nominal pressure	
• 2-wire	< 20 mA
• 3-wire	< 5 mA
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.
Certificates and approvals	
Approval	CE conformity

Measuring range [bar]	Measuring range [psi]	Max. perm. operating pressure (on either side)	Burst pressure	Max. perm. operating pressure (on one side)	Accuracy
0 ... 0.1	0 ... 1.45	25 bar (363 psi)	37.5 bar (544 psi)	0.6 bar (8.7 psi)	≤ 1,0 %
0 ... 0.2	0 ... 2.9	25 bar (363 psi)	37.5 bar (544 psi)	0.6 bar (8.7 psi)	≤ 0,8 %
0 ... 0.25	0 ... 3.63	25 bar (363 psi)	37.5 bar (544 psi)	0.6 bar (8.7 psi)	≤ 0,5 %
0 ... 0.3	0 ... 4.35	25 bar (363 psi)	37.5 bar (544 psi)	0.6 bar (8.7 psi)	≤ 0,5 %
0 ... 0.4	0 ... 5.8	25 bar (363 psi)	37.5 bar (544 psi)	1.2 bar (17.4 psi)	≤ 0,8 %
0 ... 0.5	0 ... 7.25	25 bar (363 psi)	37.5 bar (544 psi)	1.2 bar (17.4 psi)	≤ 0,5 %
0 ... 0.6	0 ... 8.7	25 bar (363 psi)	37.5 bar (544 psi)	1.2 bar (17.4 psi)	≤ 0,5 %
0 ... 1.0	0 ... 14.5	25 bar (363 psi)	37.5 bar (544 psi)	2 bar (29 psi)	≤ 0,5 %
0 ... 1.6	0 ... 23.2	25 bar (363 psi)	37.5 bar (544 psi)	3.2 bar (46.4 psi)	≤ 0,5 %
0 ... 2.5	0 ... 36.3	25 bar (363 psi)	37.5 bar (544 psi)	5 bar (72.5 psi)	≤ 0,5 %
0 ... 4	0 ... 58	25 bar (363 psi)	37.5 bar (544 psi)	8 bar (116 psi)	≤ 0,5 %
0 ... 6	0 ... 87	25 bar (363 psi)	37.5 bar (544 psi)	12 bar (174 psi)	≤ 0,5 %
0 ... 10	0 ... 145	50 bar (725 psi)	75 bar (1088 psi)	20 bar (290 psi)	≤ 0,5 %
0 ... 16	0 ... 232	50 bar (725 psi)	75 bar (1088 psi)	32 bar (464 psi)	≤ 0,5 %
0 ... 25	0 ... 363	50 bar (725 psi)	75 bar (1088 psi)	50 bar (725 psi)	≤ 0,5 %

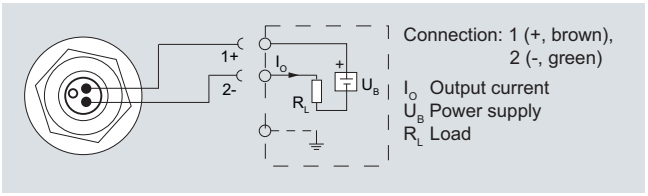
Schematics



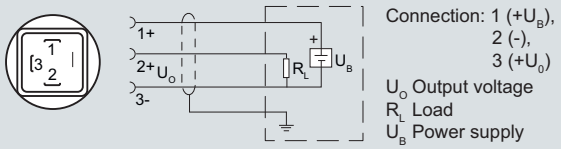
Connection with current output 4 ... 20 mA and plug to EN 175301-803-A



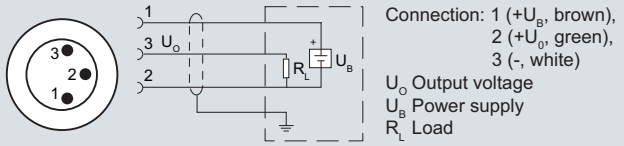
Connection with current output 4 ... 20 mA and round connector



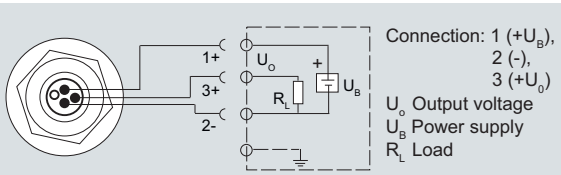
Connection with current output 4 ... 20 mA and permanently fixed cable



Connection with voltage output 0 ... 5 V DC (0 ... 10 V DC) and plug to EN 175301-803-A

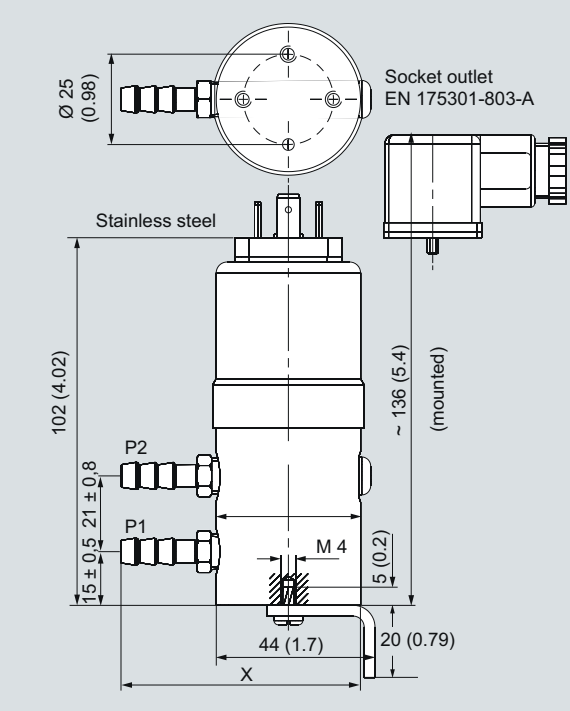


Connection with voltage output 0 ... 5 V DC (0 ... 10 V DC) and round connector

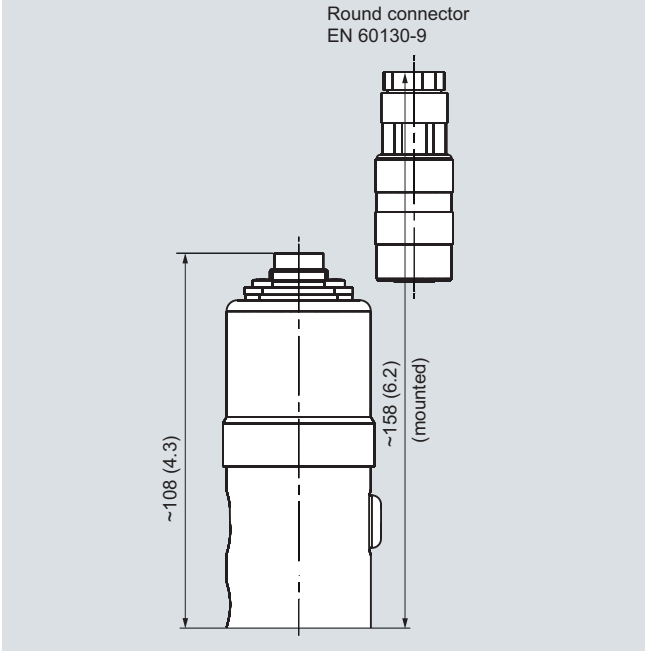


Connection with voltage output 0 ... 5 V DC (0 ... 10 V DC) and permanently fixed cable

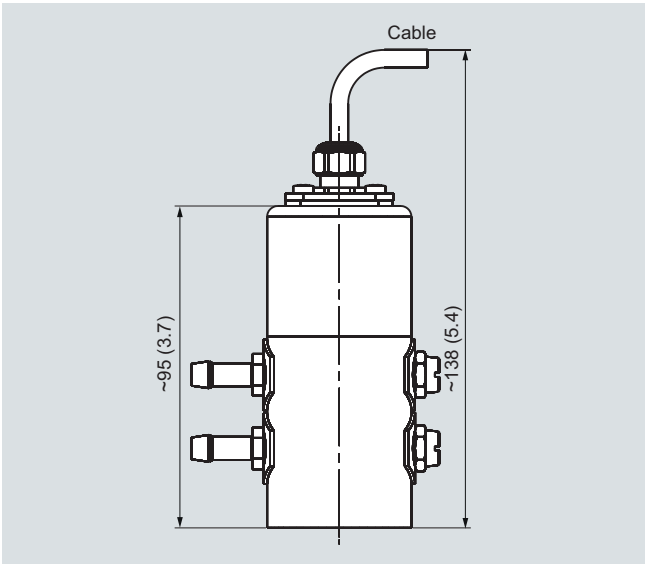
Dimensional drawings



SITRANS P250 differential pressure transmitter with socket outlet to EN 175301-803-A, dimensions in mm (inch)

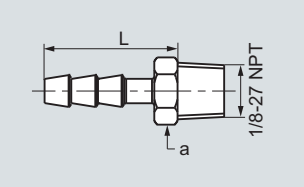
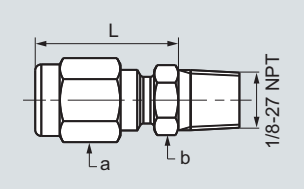
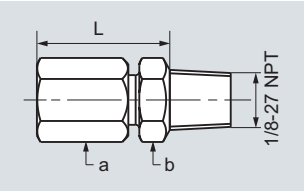
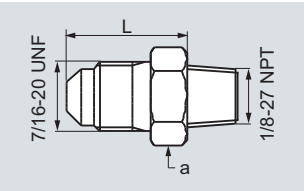
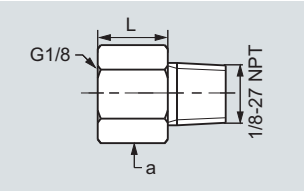
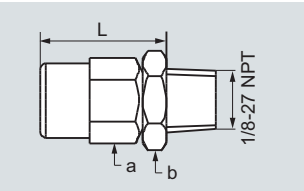


SITRANS P250 differential pressure transmitter with round connector to EN 60130-9, dimensions in mm (inch)



SITRANS P250 differential pressure transmitter with cable, dimensions in mm (inch)

SITRANS P250
for differential pressure

Process connections		∅		Width across flats	L		X	
		[mm]	[inch]		[mm]	[inch]	[mm]	[inch]
	Hose connection for hose (CuZn nickel-plated)	4	0.16	a = 10	20	0.79	61	2.40
		6	0.24	a = 10	25	0.99	66	2.60
	Pipe union with screw-in nipple for outer pipe (CuZn nickel-plated)	6	0.24	a = 10 b = 12	24	0.95	65	2.56
		8	0.32	a = 12 b = 14	25	0.99	66	2.60
	Pipe union with screw-in nipple for outer pipe (stainless steel 1.4305/AISI 303)	6	0.24	a = 10 b = 12	24	0.95	65	2.56
		8	0.32	a = 12 b = 14	26	1	67	2.64
	Male thread G1/8 7/16-20 UNF (CuZn nickel-plated)	-	-	a = 14	18	0.71	59	2.32
	Female thread G1/8 (stainless steel 1.4305/AISI 303)	-	-	a = 14	12	0.47	53	2
	Male thread G1/8 (CuZn nickel-plated)	-	-	a = 10 b = 12	20	0.79	61	2.40

Selection and Ordering data	Order No.	Order code
SITRANS P250 pressure transmitter for differential pressure Accuracy ≤ 1 %, wetted parts ceramic/stainless steel 1.4301, scope of delivery: transmitter, mounting bracket and instruction manual, without explosion protection	**7MF1641-**	**0 -** **0**
Measuring range		
0 ... 0.1 bar (0 ... 1.45 psi)	**3AA**	
0 ... 0.2 bar (0 ... 2.90 psi)	**3AC**	
0 ... 0.25 bar (0 ... 3.63 psi)	**3AD**	
0 ... 0.3 bar (0 ... 5.35 ps)	**3AE**	
0 ... 0.4 bar (0 ... 5.80 psi)	**3AF**	
0 ... 0.5 bar (0 ... 7.25 psi)	**3AG**	
0 ... 0.6 bar (0 ... 8.70 psi)	**3AH**	
0 ... 1.0 bar (0 ... 14.5 psi)	**3BA**	
0 ... 1.6 bar (0 ... 23.2 psi)	**3BB**	
0 ... 2.5 bar (0 ... 36.3 psi)	**3BD**	
0 ... 4.0 bar (0 ... 58.0psi)	**3BE**	
0 ... 6.0 bar (0 ... 87.0 psi)	**3BG**	
0 ... 10.0 bar (0 ... 145 psi)	**3CA**	
0 ... 16.0 bar (0 ... 232 psi)	**3CB**	
0 ... 25.0 bar (0 ... 363 psi)	**3CD**	
Output signal		
4 ... 20 mA	**0**	
0 ... 5 V DC	**1**	
0 ... 10 V DC	**2**	
Electrical connection		
Plug acc. to EN 175 301-803-A (suitable coupling included in scope of delivery)	**1**	
Round connector acc. to EN 60139-9	**2**	
Cable 1.5 m with cable gland	**3**	
Process connection		
Without connections, female thread 1/8-27 NPT	**A**	
Hose connection		
• CuZn nickel-plated, for hose ∅ 4 mm	**B**	
• CuZn nickel-plated, for hose ∅ 6 mm	**C**	
• PVDF, for hose ∅ 6 mm	**D**	
Pipe union		
• CuZn nickel-plated, for pipe ∅ 6 mm	**E**	
• Stainless steel 1.4304, for pipe ∅ 6 mm	**F**	
• CuZn nickel-plated, for pipe ∅ 8 mm	**G**	
• Stainless steel 1.4304, for pipe ∅ 8 mm	**H**	
Male thread, 7/16-20 UNF (CuZn nickel-plated)	**L**	
Adapter		
• Inner, G1/8 (stainless steel), for pipe ∅ 6 mm	**M**	
• Outer, G1/8 (stainless steel), with union nut, for pipe ∅ 6 mm	**N**	
Sealing material		
Fluoro rubber (Viton/FPM)	**A**	
Ethylene propylene diene monomer rubber (EPDM)	**B**	
Nitrile butadiene rubber (NBR)	**C**	
Silicone rubber (MVQ)	**D**	
Neoprene (CR)	**E**	
Further designs Please add "**-Z**" to Order No. and specify Order code(s).	Order Code	
Factory calibration certificate to IEC 60770-2	**C11**	

SITRANS P MPS (submersible sensor)
Transmitter for hydrostatic level

Overview

SITRANS P MPS pressure transmitters are submersible sensors for hydrostatic level measurements.

The SITRANS P MPS pressure transmitters are available for various measuring ranges and with explosion protection as an option.

A junction box and a cable hanger are available as accessories for simple installation.

Benefits

- Compact design
- Simple installation
- Small error in measurement (0,3 %)
- Degree of protection IP68

Application

SITRANS P MPS pressure transmitters are used in the following branches for example:

- Oil and gas industries
- Shipbuilding
- Water supply
- For use in pressureless/open tanks and wells

Design

SITRANS P MPS pressure transmitters have a front-flush piezo-resistive sensor with stainless steel diaphragm.

These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel housing. The cable also contains a strength cord and vent pipe.

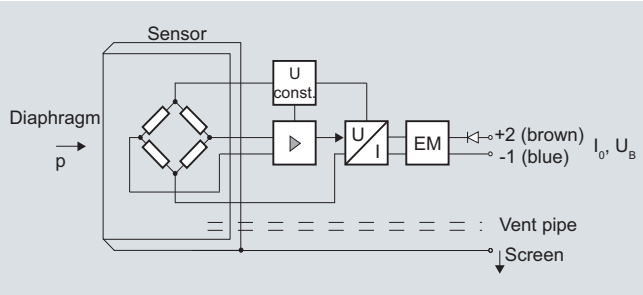
The diaphragm is protected against external influences by a protective cap.

The sensor, electronic circuit and cable are sealed in a common housing of small dimensions.

The pressure transmitter is temperature-compensated for a wide temperature range.

Function

SITRANS P MPS pressure transmitters are for measuring the liquid levels in wells, tanks, channels and dams.



SITRANS P MPS pressure transmitter, mode of operation and wiring diagram

On one side of the sensor, the diaphragm is exposed to the hydrostatic pressure which is proportional to the submersion depth. This pressure is compared with atmospheric pressure. Pressure compensation is carried out using the vent pipe in the connection cable.

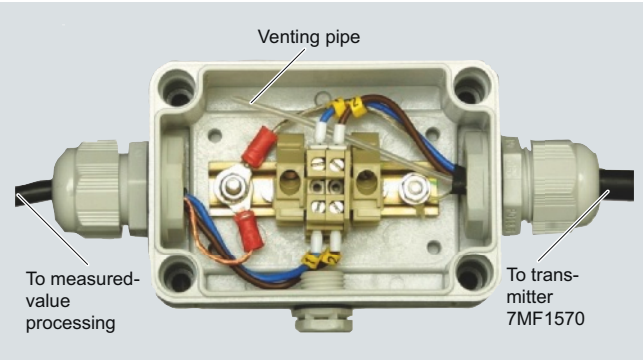
The hydrostatic pressure of the liquid column acts on the sensor diaphragm, and transmits the pressure to the piezo-resistive bridge in the sensor.

The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

The cable of the 7MF1570 transmitter must always be connected in the supplied junction box. The junction box has to be installed near the measuring point.

If the medium is anything other than water, it is also necessary to check compatibility with the specified materials of the transmitter.

Integration



Junction box 7MF1570-8AA, opened

Measuring point setup, in principle

Technical specifications

SITRANS P MPS pressure measurement transmitter (submersible sensor)	
Mode of operation	
Measuring principle	piezo-resistive
Input	
Measured variable	Hydrostatic level
Measuring range	Maximum operating pressure
• 0 ... 2 mH_2O (0 ... 6 ftH_2O)	• 1,4 bar (20.3 psi) (corresponds to 14 mH_2O (42 ftH_2O))
• 0 ... 4 mH_2O (0 ... 12 ftH_2O)	• 1,4 bar (20.3 psi) (corresponds to 14 mH_2O (42 ftH_2O))
• 0 ... 5 mH_2O (0 ... 15 ftH_2O)	• 1,4 bar (20.3 psi) (corresponds to 14 mH_2O (42 ftH_2O))
• 0 ... 6 mH_2O (0 ... 18 ftH_2O)	• 3,0 bar (43.5 psi) (corresponds to 30 mH_2O (90 ftH_2O))
• 0 ... 10 mH_2O (0 ... 30 ftH_2O)	• 3,0 bar (43.5 psi) (corresponds to 30 mH_2O (90 ftH_2O))
• 0 ... 20 mH_2O (0 ... 60 ftH_2O)	• 5,0 bar (72.5 psi) (corresponds to 50 mH_2O (150 ftH_2O))
Output	
Output signal	4 ... 20 mA
Measuring accuracy	Acc. to IEC 60770-1
Error in measurement at limit setting incl. hysteresis and reproducibility	0.3 % of full-scale value (typical)
Influence of ambient temperature	
Zero and span	
• 1 ... 6 mH_2O (3 ... 18 ftH_2O)	0.45 %/10 K of full-scale value
• ≥ 6 mH_2O (≥ 18 ftH_2O)	0.3 %/10 K of full-scale value
Long-term stability	
Zero and span	
• 1 ... 6 mH_2O (3 ...18 ftH_2O)	0.25 % of full-scale value/year
• ≥ 6 mH_2O (≥ 18 ftH_2O)	0.2 % of full-scale value/year
Rated conditions	
Ambient conditions	
• Process temperature	-10 ... +80 °C (14 ... 176 °F)
• Storage temperature	-40 ... +100 °C (-40 ... +212 °F)
Degree of protection to DIN EN 60529	IP68
Design	
Weight	
• Pressure transmitter	≈ 0.4 kg (≈ 0.88 lb)
• Cable	0.08 kg/m (≈ 0.054 lb/ft)
Electrical connection	Cable with 2 conductors with screen and vent pipe, strength cord (max. 300 N (67.44 lbf)
Material	
• Seal diaphragm	Stainless steel, mat. no. 316L/ 316 Ti
• Enclosure	Stainless steel, mat. no. 316L/ 316 Ti
• Gasket	Viton
• Connecting cable	Either PE/HFFR sheath (non-halogen) or FEP sheath
Power supply	
Terminal voltage on pressure transmitter U_B	10 ... 33 V DC
Certificates and approvals	
The transmitter is not subject to the pressure equipment directive (PED 97/23/EC)	
Explosion protection	
• Intrinsic safety "i"	TÜV 03 ATEX 2004X
- Marking	Ex II 1 G EEx ia IIC T4
Junction box	
Application	for connecting the transmitter cable
Design	
Weight	0.2 kg (0.44 lb)
Electrical connection	2 x 3-way (28 to 18 AWG)
Cable entry	2 x M20 x 1.5
Enclosure material	polycarbonate
Vent pipe for atmospheric pressure	
Screw for cable strength cord	
Rated conditions	
Degree of protection to DIN EN 60529	IP54
Cable hanger	
Application	for mounting the transmitter
Design	
Weight	0.16 kg (0.35 lb)
Material	Galvanized steel, polyamide

SITRANS P MPS (submersible sensor)
Transmitter for hydrostatic level

Selection and Ordering data		Order No.	Order code
SITRANS P MPS pressure transmitter for gauge pressure (submersible sensor)	C)	**7MF1570-** ■■	**A0** ■ ■■■
2-wire system			
Note: Junction box and cable hanger included in delivery			
With PE cable			
Measuring range	**Cable length L**		
0 ... 2 mH_2O	10 m		**1C**
0 ... 4 mH_2O	10 m		**1D**
0 ... 5 mH_2O	25 m		**1B**
0 ... 6 mH_2O	25 m		**1E**
0 ... 10 mH_2O	25 m		**1F**
0 ... 20 mH_2O	25 m		**1G**
0 ... 6 ftH_2O	32 ft		**1K**
0 ... 12 ftH_2O	32 ft		**1L**
0 ... 18 ftH_2O	82 ft		**1M**
0 ... 30 ftH_2O	82 ft		**1N**
0 ... 60 ftH_2O	82 ft		**1P**
Special cable lenght/Special measuring range[1] Please add **„-Z“** to Order No. and specify Order code and plain text. Note: Indication of measuring range Y01 is always necessary.			**9A** **H..** + **Y01**
3 m			**H1A**
5 m			**H1B**
7 m			**H1C**
10 m			**H1D**
15 m			**H1E**
20 m			**H1F**
25 m			**H1G**
30 m			**H1H**
40 m			**H1J**
50 m			**H1K**
60 m			**H1L**
70 m			**H1M**
80 m			**H1N**
90 m			**H1P**
100 m			**H1Q**
125 m			**H1R**
150 m			**H1S**
175 m			**H1T**
200 m			**H1U**
225 m			**H1V**
250 m			**H1W**
275 m			**H1X**
300 m			**H2A**
350 m			**H2B**
400 m			**H2C**
450 m			**H2D**
500 m			**H2E**
550 m			**H2F**
600 m			**H2G**
650 m			**H2H**
700 m			**H2J**
750 m			**H2K**
800 m			**H2L**
850 m			**H2M**
900 m			**H2N**
950 m			**H2P**
1000 m			**H2Q**

Selection and Ordering data		Order No.	Order code
SITRANS P MPS pressure transmitter for gauge pressure (submersible sensor)	C)	**7MF1570-** ■■	**A0** ■ ■■■
2-wire system			
Note: Junction box and cable hanger included in delivery			
With FEP cable			
Measuring range	**Cable length L**		
0 ... 2 mH_2O	10 m		**5C**
0 ... 4 mH_2O	10 m		**5D**
0 ... 5 mH_2O	25 m		**5B**
0 ... 6 mH_2O	25 m		**5E**
0 ... 10 mH_2O	25 m		**5F**
0 ... 20 mH_2O	25 m		**5G**
0 ... 6 ftH_2O	32 ft		**5K**
0 ... 12 ftH_2O	32 ft		**5L**
0 ... 18 ftH_2O	82 ft		**5M**
0 ... 30 ftH_2O	82 ft		**5N**
0 ... 60 ftH_2O	82 ft		**5P**
Special cable lenght/Special measuring range[1] Please add **„-Z“** to Order No. and specify Order code and plain text. Note: Indication of measuring range Y01 is always necessary.			**9A** **H..** + **Y01**
3 m			**H5A**
5 m			**H5B**
7 m			**H5C**
10 m			**H5D**
15 m			**H5E**
20 m			**H5F**
25 m			**H5G**
30 m			**H5H**
40 m			**H5J**
50 m			**H5K**
60 m			**H5L**
70 m			**H5M**
80 m			**H5N**
90 m			**H5P**
100 m			**H5Q**
125 m			**H5R**
150 m			**H5S**
175 m			**H5T**
200 m			**H5U**
225 m			**H5V**
250 m			**H5W**
275 m			**H5X**
300 m			**H6A**
350 m			**H6B**
400 m			**H6C**
450 m			**H6D**
500 m			**H6E**
550 m			**H6F**
600 m			**H6G**
650 m			**H6H**
700 m			**H6J**
750 m			**H2K**
800 m			**H6L**
850 m			**H6M**
900 m			**H6N**
950 m			**H6P**
1000 m			**H6Q**

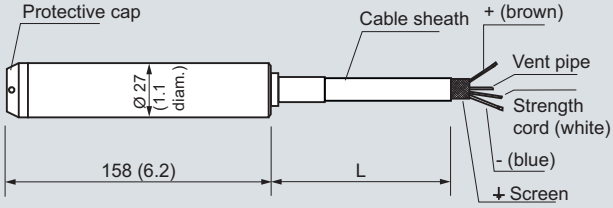
Selection and Ordering data	Order No.	Order code
SITRANS P MPS pressure transmitter for gauge pressure (submersible sensor)	C) **7MF1570-**	**A0** ■ ■■■
2-wire system		
Note: Junction box and cable hanger included in delivery		
Explosion protection		
• None		**1**
• with type of protection "intrinsic safety" (Ex II 1 G EEx ia IIC T4)		**2**
Further designs	Order code	
Quality inspection certificate (factory calibration) to IEC 60770-2, add „**-Z**“ to order no. and add order code.	**C11**	
Indication of measuring range (only at special cable lengths) in „... to ... mH_2O“ or „... to ... ftH_2O“	**Y01**	
Accessories (as spare part)	Order No.	
Junction box for connecting the transmitter cable	**7MF1570-8AA**	
Cable hanger for attachment of transmitter	**7MF1570-8AB**	

Power supply units see Chap. 8 "Supplementary Components".

1) Special measuring ranges of between 0 ... 1 mH_2O (0 ... 3 ftH_2O) and 0 ... 200 mH_2O (0 ... 656 ftH_2O) and special cable lengths of up to 1000 m (3281 ft) are possible. With Ex versions the max. custom cable length is 50 m (150 ft). The length of free hanging cable should not exceed 375 m (1230 ft).
Note: Due to mounting reasons it has to be considered that the cable always must be longer than the height of the liquid column to be measured.

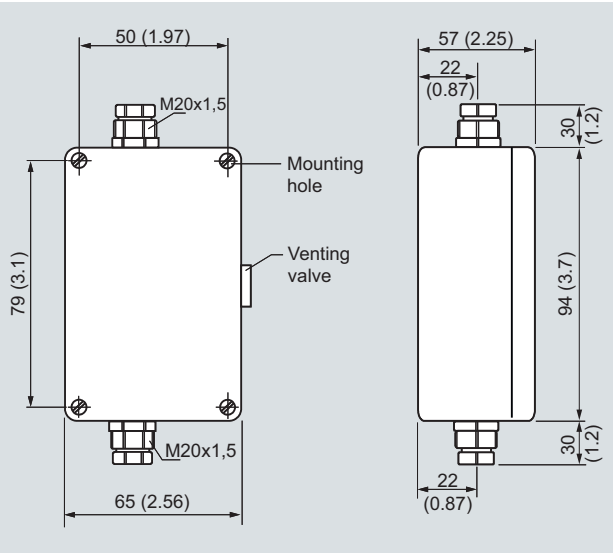
C) Subject to export regulations AL: N, ECCN: EAR99.

Dimensional drawings

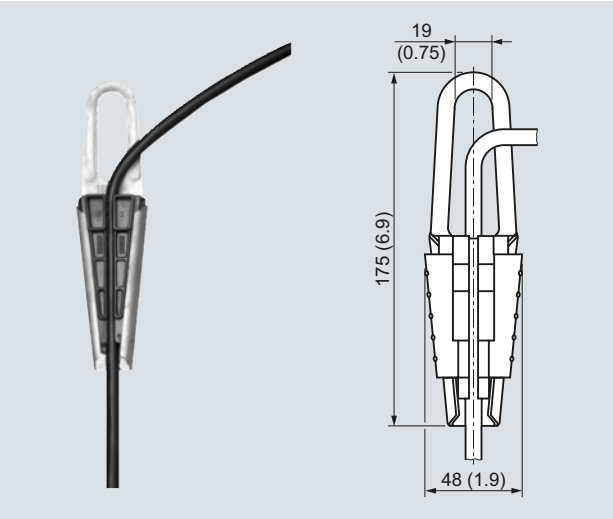


Cable sheath 8.3 (0.33) diam. (black or blue, PE/HFFR)
Flexible cable with 0.5 mm^2 (0.00078 $inch^2$) cross-section
Vent pipe 1 (0.04) diam. (inner diameter)
Protective cap with 4 x 3 diam. (4 x 0.12 diam.) holes (black, PA)

SITRANS P MPS pressure transmitters, dimensions in mm (inch)



Junction box, dimensions in mm (inch)

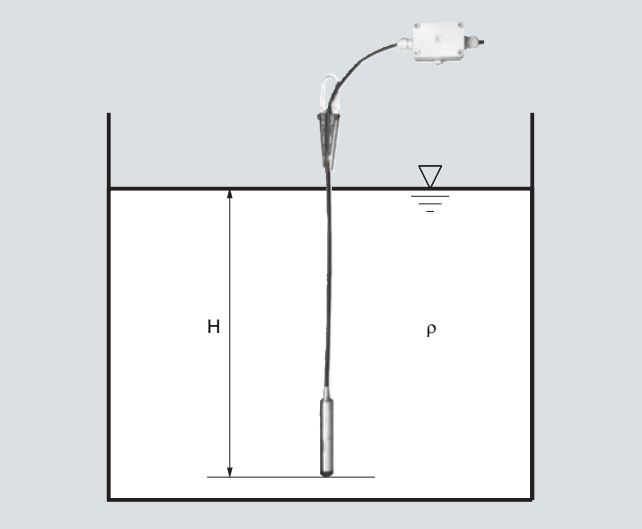


Cable hanger, dimensions in mm (inch)

SITRANS P MPS (submersible sensor)
Transmitter for hydrostatic level

More information

Determination of the measuring range in case of media with a density ≠ 1000 kg/m3 (medium ≠ water)



Calculation of the measuring range:

p = ρ x g x H

with:

ρ = density of medium

g = local acceleration due to gravity

H = maximum level

Example:

Medium: Diesel fuel, ρ = 850 kg/m^3

Acceleration due to gravity: 9.81 m/s^2

Start-of-scale: 0 m

Maximum level: 6.2 m

Cable length: 7 m, FEP cable

Calculation:

p = 850 kg/m^3 x 9.81 m/s^2 x 6.2 m

p = 51698.7 N/m^2

p = 517 mbar

Transmitter to be ordered:

7MF1570-9AA02-Z, H5C + Y01

Y01: 0 ... 517 mbar

Overview

SITRANS P280 for flexible and cost-effective applications in pressure monitoring

- Supports the WirelessHART standard (HART V 7.1)
- Very high security level for wireless data transmission
- Built-in local user interface (LUI) with 3-button operation
- Optimum display and readability using graphical display (104 x 80 pixels) with integrated backlight
- Stand-by (deep sleep phase) can be activated and deactivated device with push of a button
- Battery power supply
- Battery service live up to 5 years
- Extend battery service life with HART modem interface which can be shut off
- Optimized power consumption through new design, and increase in battery service life.
- Simple configuration thanks to SIMATIC PDM
- Device meets IP65 degree of protection
- Can be used for absolute and gauge pressure measurements

Benefits

The SITRANS P280 is a pressure transmitter that features Wireless HART as the standard communication interface.

Also available is a wired interface to connect a HART modem:

- Flexible pressure measurements
- Save costs on writing for difficult installation conditions. Wireless technology offers cost advantages in cases where extensive wiring cost would normally apply.
- It enables additional hitherto unfeasible measuring points, particularly for monitoring purposes.
- Easy installation on moveable equipment
- Enables cost-effective temporary measurements, for example for process optimizations.
- Optimum solution in addition to wired communication and new possibilities for system solutions in process automation

Application

The SITRANS P280 is a WirelessHART field device for measuring absolute and gauge pressure.

The measuring ranges for absolute and gauge pressure measurements are 0 to 29, 145, 725, 2900 and 5800 psi (0 to 2, 10, 50, 200 and 400 bar).

The sensor is integrated into the transmitter housing.

On the wireless communication side, the transmitter supports the WirelessHART standard. A HART modem can be connected to the transmitter particularly for initial comissioning, alternatively the device can be commissioned comfortably by means of the local pushbuttons w/o any additional handset devices.

It can be used in all industries and applications in non-explosive areas.

Design

The SITRANS P280 has a robust aluminum enclosure and is suitable for outside use. It conforms with the IP65 safety class.

The operating temperature range is -40 to +80 °C (-40 to +176 °F). Power supply is provided through an integrated battery, which is available as an accessory. The device is only approved for operation with this battery.

The aerial features a rotatable joint which can be used for directional alignment. Wireless signals can thus be optimally received and transmitted.

A special highlight is the option for direct operation on the device. The operating strategy used in this case seamlessly integrates into the strategy of all new Siemens field devices.

Using the device's control buttons, it is easy to turn the HART modem interface of the device on and off. The device can be put to passive status and reactivated at any time. This helps to extend the service life of the battery.

The SITRANS P280 transmitter features a ceramic measuring cell for gauge and absolute pressure measurements.

Function

The SITRANS P280 can join to a WirelessHART network. It can be parameterized and operated through this network. Measured process values are transported via the network to the SIEMENS IE/WSN-PA link.

Field device data received by the IE/WSN-PA LINK is transmitted to the connected systems, for example the process control system SIMATIC PCS 7. For an introduction of WirelessHART, please see the FI 01 catalogue, section 9 or http://www.siemens.de/wirelesshart.

Detailed information on IE/WSN-PA can be found in the FI 01 catalogue, section 9 or http://www.siemens.de/wirelesshart.

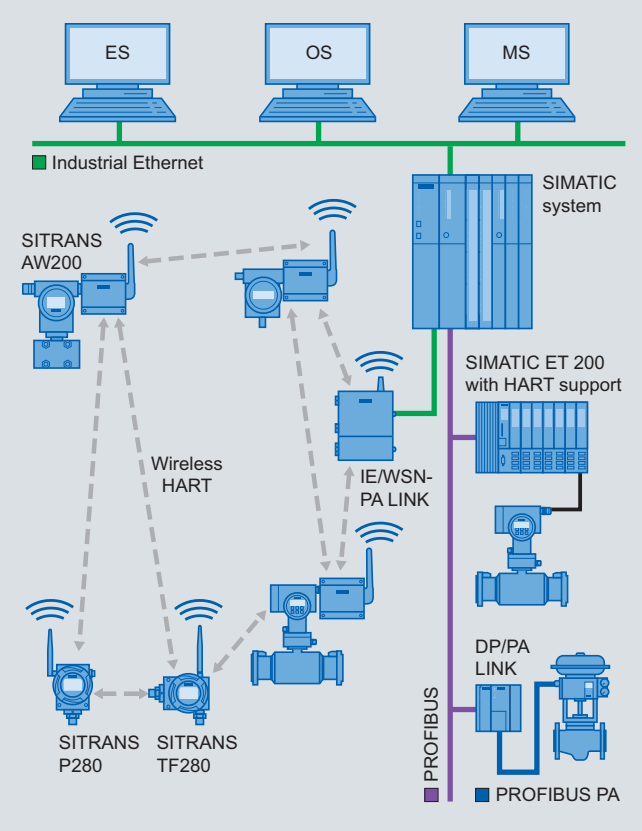
SITRANS P280
for gauge and absolute pressure

Integration

Connecting to SIMATIC PCS 7

The integration of field devices in SIMATIC PCS 7 and other process control systems can now be done seamlessly and cost-effectively with wireless technology, especially in situations where high wiring costs may be expected. Of particular interest are measuring points which are to be added and for which no MSR wiring is available.

Where larger distances between the IW/WSN-PA LINK and control systems need to be overcome, this connection can also be implemented on a wireless and cost-effective basis using the products of the SCALANCE W family.



Integration of a meshed network in SIMATIC PCS7

Configuration

Configuration of the SITRANS P280 may be carried out as follows:

- Initial comissioning for the SITRANS P280 with SIMATIC PDM is generally carried out via a HART modem or the integrated local user interface, since the network ID and join key must be set up on the device before it can be accepted and integrated into the WirelessHART network.
- Once it is integrated into the network, the device can be conveniently operated with the WirelessHART network, the onsite HART modem or via the local user interface.
- Siemens WirelessHART devices operate with optimum coexistence to SCALANCE W family products.

Technical specifications

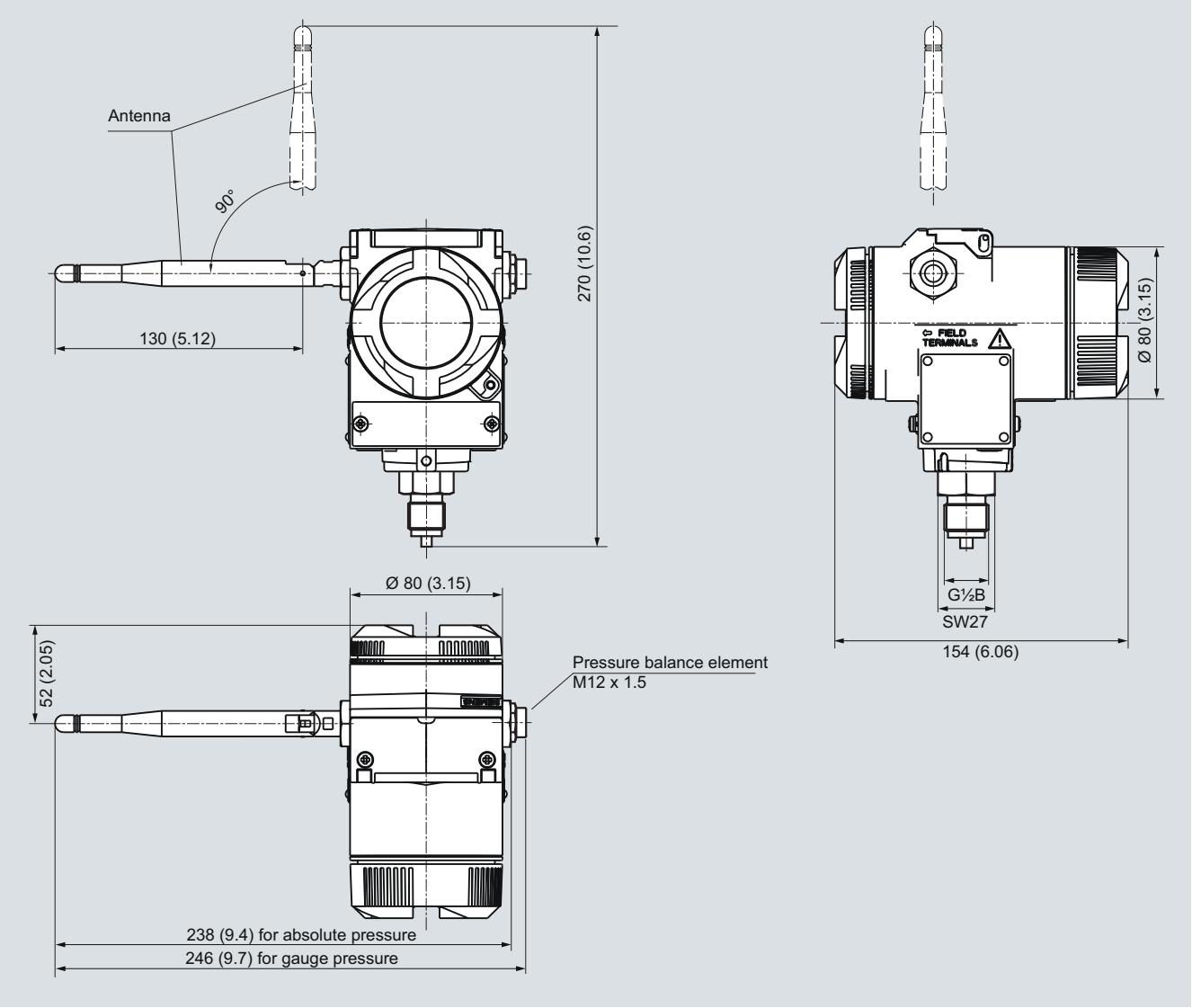
SITRANS P280 WirelessHART pressure transmitter	
Mode of operation	
Measuring principle	piezo-resistive
Measured variable	Gauge and absolute pressure
Gauge pressure input	
Measuring range	Overload limit/Bursting pressure
0 ... 29 psi (0 ... 2 bar)	72.5 psi (5 bar)
0 ... 145 psi 0 ... 10 bar)	363 psi (50 bar)
0 ... 725 psi 0 ... 50 bar)	1740 psi (250 bar)
0 ... 2900 psi (0 ... 200 bar)	7250 psi (650 bar)
0 ... 5800 psi (0 ... 400 bar)	7250 psi (650 bar)
Units	mbar, bar, mmH_2O, inH_2O, atm, Torr, gcm^2, $kgcm^2$, mPa, KPa, Pa, psi, mmHG, mmH_2O, ftH_2O, inHG, inH_2O
Absolute pressure input	
Measuring range	Overload limit/Bursting pressure
0 ... 29 psia (0 ... 2 bar a)	72.5 psia (5 bar a)
0 ... 145 psia (0 ... 10 bar a)	363 psia (50 bar a)
0 ... 725 psia (0 ... 50 bar a)	1740 psia (250 bar a)
0 ... 2900 psia (0 ... 200 bar a)	7250 psia (650 bar a)
0 ... 5800 psia (0 ... 400 bar a)	7250 psia (650 bar a)
Units	mbar, bar, mmH_2O, inH_2O, atm, Torr, gcm^2, $kgcm^2$, mPa, KPa, Pa, psi, mmHG, mmH_2O, ftH_2O, inHG, inH_2O
Output	
Output signal	2.4 GHz Wireless signal with TSMP (Time Synchronized Mesh Protocol)
Measuring accuracy	as per IEC 60770-1
Error in measurement at limit setting incl. hysteresis and reproducibility	typ. 0.17 % of sensor's span max. 0.25 % of sensor's span
Long-term stability	max. ± 0.25 % of sensor/year span
Influence of ambient temperature	typ. 0.07 %/10K, max. 0.2 %/10 K of sensor's span
Rated conditions	
Ambient conditions	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F) (in ambient temperatures below -20 °C (-4 °F) and above +70 °C (158 °F), readability of the display is limited.)
• Storage temperature	-40 ... +85 °C (-40 ... +185 °F)
• Relative humidity	< 95 %
Climatic class	4K4H in accordance with EN 60721-3-4(stationary use at locations not protected against weather)
Degree of protection	IP65/NEMA 4
Allowable media temperature	-40 ... +85 °C (-40 ... +185 °F)

Design	
Enclosure material	low-copper die-cast aluminum, GD-AlSi12
Shock resistance	in accordance with DIN EN 60068-2-29 / 03.95
Resistance to vibration	in accordance with DIN EN 60068-2-6/ 12.07 20 ≤ f ≤ 2000 Hz 0.01 g^2/Hz
Weight	
without battery	1.5 kg (3.31 lb)
With battery	1.6 kg (3.53 lb)
Dimensions (W x H x D)	See Dimensional drawings
Process connection	• G½B male thread as per EN837-1 • ½-14 NPT
Sensor break	Is recognized
• Displays and controls	
Display (with illumination)	
• Size of display	104 x 80 pixels
• Number of digits	adjustable
• Number of spaces after comma	adjustable
Setting options	• on site with 3 buttons • with SIMATIC PDM or HART Communicator
Power supply	
Battery	3.6 V DC
Communication	
Radio	WirelessHART V7.1 conforming
Transmission frequency band	2.4 GHz (ISM-Band)
Transmission range under reference conditions	Up to 250 m (line of sight) in outside areas Up to 50 m (greatly dependent on obstacles) in inside areas
Communication interfaces	• HART communication with HART modem • WirelessHART
Certificates and approvals	
Wireless communication approvals	R&TTE FCC
Classification according to pressure equipment directive (PED 97/23/EC)	Gases: Fluid group 1 Liquids: Fluid group 1; meets requirements as per Section 3, Subsection 3 (sound engineering practice)

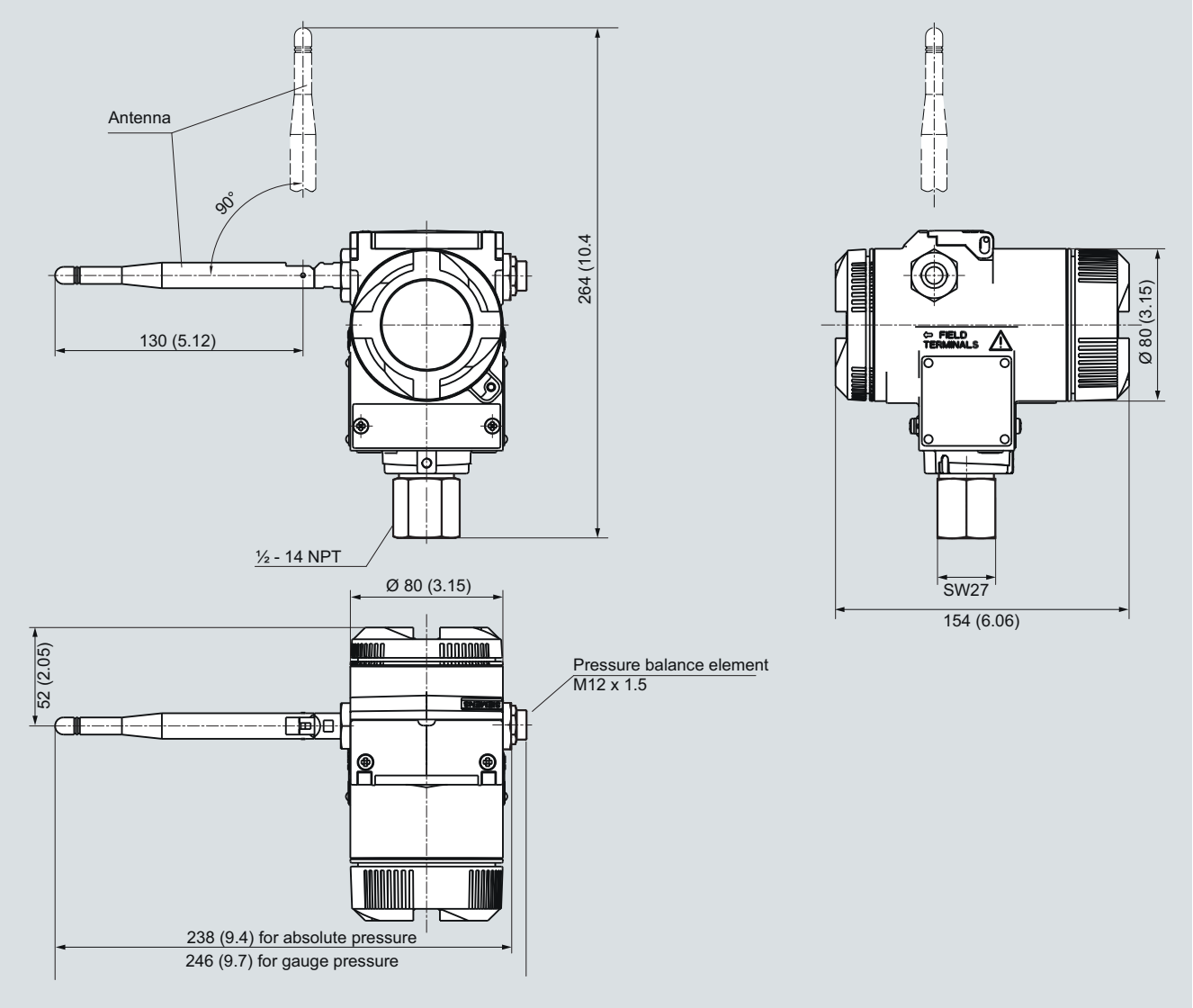
Selection and Ordering data		Order No.
SITRANS P280 WirelessHART pressure transmitter (Required battery not included with delivery, see accessories)	D)	**7MP1120-** ■■■■■ ■■■ **0**
Measuring cell filling		
Dry measuring cell		**0**
Measuring span		
Gauge pressure		
0 ... 29 psi (0 ... 2 bar)		**D**
0 ... 145 psi (0 ... 10 bar)		**E**
0 ... 725 psi (0 ... 50 bar)		**F**
0 ... 2900 psi (0 ... 200 bar)		**G**
0 ... 5800 psi (0 ... 400 bar)		**H**
Absolute pressure		
0 ... 29 psia (0 ... 2 bar a)		**M**
0 ... 145 psia (0 ... 10 bar a)		**N**
0 ... 725 psia (0 ... 50 bar a)		**P**
0 ... 2900 psia (0 ... 200 bar a)		**Q**
0 ... 5800 psia (0 ... 400 bar a)		**R**
Wetted parts		
Ceramic		**K**
Display		
Digital display, visible		**1**
Enclosure		
Die-cast aluminum		**1**
Process connection		
G½ as per EN 837-1		**0**
½-14 NPT		**1**
Explosion protection		
Without		**A**
Antenna		
Variable, attached to device		**A**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code(s) and plain text.		
Tag number/Identification (max. 16 characters), specify in plain text: Y15:		**Y15**
Tag description (max. 27 characters), specify in plain text: Y16:		**Y16**
Accessories		Order No.
Lithium battery for SITRANS TF280/P280	D)	**7MP1990-0AA00**
Mounting bracket, steel		**7MF4997-1AC**
Mounting bracket, stainless steel		**7MF4997-1AJ**
Cover, die-cast aluminum, without window	F)	**7MF4997-1BB**
Cover, die-cast aluminum, with window	F)	**7MF4997-1BE**
IE/WSN-PA LINK		**see Sec. 9**
HART modem with RS232 interface	D)	**7MF4997-1DA**
HART modem with USB interface	D)	**7MF4997-1DB**
SIMATIC PDM		**see Sec. 9**

D) Subject to export regulations AL: N, EAR 99H.
F) Subject to export regulations AL: 9I999, ECCN: N.

Dimensional drawings



SITRANS P280 WirelessHART pressure transmitter, process connection G½", dimensions in mm (inch)
The dimensional drawing of the mounting bracket see on page 2/147.



SITRANS P280 WirelessHART pressure transmitter, process connection ½ - 14 NPT, dimensions in mm (inch)
The dimensional drawing of the mounting bracket see on page 2/147.

SITRANS P300
for gauge and absolute pressure

Overview

The SITRANS P300 is a digital pressure transmitter for relative and absolute pressure. The conventional thread versions are available as process connections, as are flush-mounted versions. A large numer of the flush-mounted versions are suitable for food and pharmaceutical applications, and satisfy the EHEDG and 3A hygiene requirements.

The output signal is a load-independent direct current from 4 to 20 mA or a PROFIBUS PA or FOUNDATION Fieldbus signal, which is linearly proportional to the input pressure. Communication is via HART protocol or PROFIBUS PA interface. Convenient buttons for easy local operation of the basic settings of the pressure transmitter.

The SITRANS P300 has a single-chamber stainless steel casing. The pressure transmitter is approved with "intrinsically safe" type of protection. It can be used in zone 1 or zone 0.

Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- Extensive diagnosis and simulation functions
- Small long-term drift
- Wetted parts made of high-grade materials (such as stainless steel, Hastelloy)
- Measuring range 0.1 psi to 5800 psi (0.008 bar to 400 bar)
- High measuring accuracy
- Parameterization over control keys and HART or PROFIBUS PA or FOUNDATION Fieldbus

Application

The pressure transmitter is available in versions for gauge pressure and for absolute pressure. The output signal is always a load-independent direct current from 4 to 20 mA or a PROFIBUS PA or FOUNDATION Fieldbussignal, which is linearly proportional to the input pressure. The pressure transmitter measures aggressive, non-aggressive and hazardous gases, as well as vapors and liquids.

It can be used for the following measurement types:

- Gauge pressure
- Absolute pressure

With appropriate parameter settings, it can also be used for the following additional measurement types:

- Level
- Volume
- Mass

The "intrinsically-safe" EEx version of the transmitter can be installed in hazardous areas (zone 1). The transmitters are provided with an EC type examination certificate and comply with the respective harmonized European standards of ATEX.

Gauge pressure

This variant measures aggressive, non-aggressive and hazardous gases, vapors and liquids.

The smallest measuring span is 0.15 psi, the largest 5800 psi (0.01 bar, the largest 400 bar).

Level

With appropriate parameter settings, the gauge pressure model measures the level of aggressive, non-aggressive and hazardous liquids.

For measuring the level in an open tank you require a gauge transmitter.

Absolute pressure

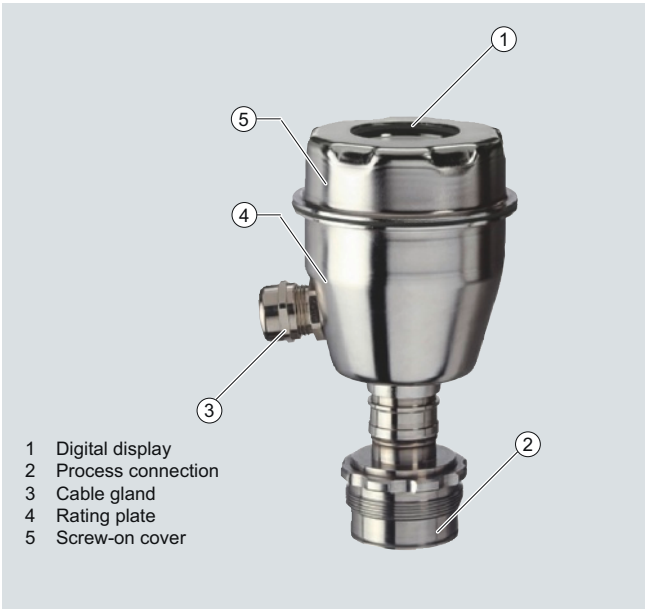
This model measures the absolute pressure of aggressive, non-aggressive and hazardous gases, vapors and liquids.

The smallest measuring span is 0.1 psia, the largest 435 psia (0.008 bar a, the largest 30 bar a).

Design

The device comprises:

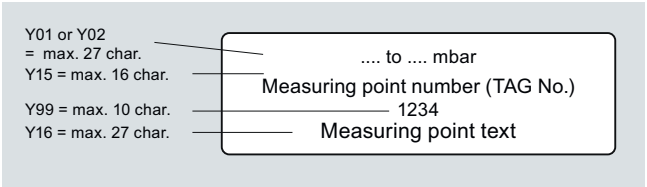
- Electronics
- Housing
- Measuring cell



Perspective view of SITRANS P300

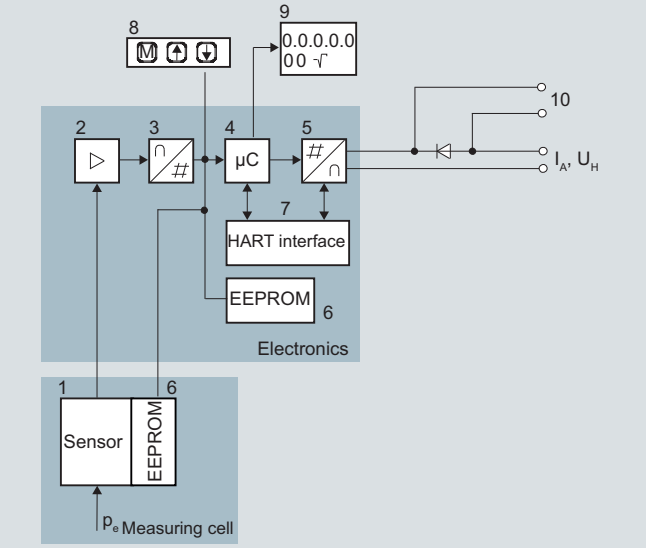
The housing has a screw-on cover (5) and, depending on the version, is with or without an inspection window. The electrical terminal housing, the buttons for operation of the device are located under this cover and, depending on the version, the digital display. The connections for the auxiliary power UH and the shield are in the terminal housing. The cable gland is mounted on the side of the housing. The measuring cell with the process connection (2) is located on the bottom of the housing. The measuring cell with the process connection may differ from the one shown in the diagram, depending on the device version.

Example of attached measuring points sign



Function

Operation of electronics with HART communication



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

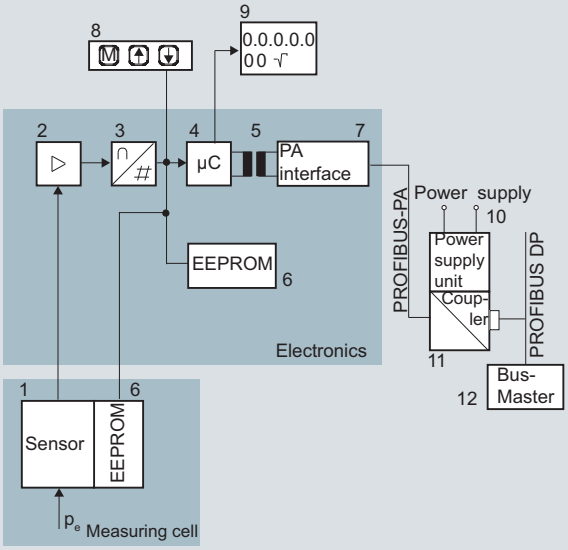
Function diagram of electronics

The input pressure is converted into an electrical signal by the sensor (1). This signal is amplified by the measuring amplifier (2) and digitalized in an analog-to-digital converter (3). The digital signal is analyzed in a microcontroller (4) and corrected according to linearity and thermal characteristics. In a digital-to-analog converter (5) it is then converted into the output current of 4 to 20 mA. A diode circuit provides reverse polarity protection. You can make an uninterrupted current measurement with a low-ohm ammeter at the connection (10). The data specific to the measuring cell, the electronic data and parameter settings are stored in two non-volatile memories (6). The first memory is linked to the measuring cell, the second to the electronics.

The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a digital display (9), you can use this to track mode settings and other messages. The basic mode settings can be changed with a computer via the HART modem (7).

2

Operation of electronics with PROFIBUS PA communication



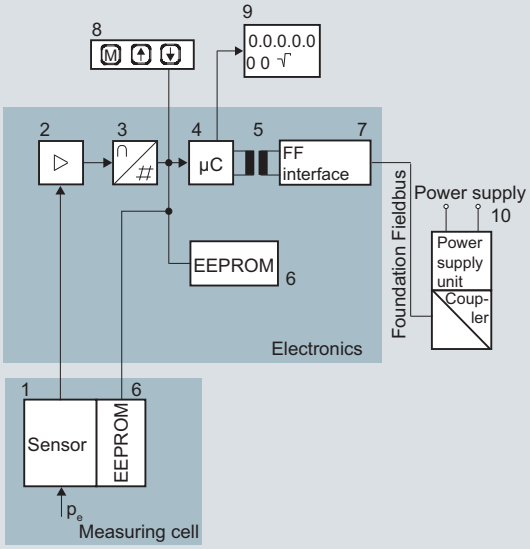
1 Measuring cell sensor
2 Instrument amplifier
3 Analog-to-digital converter
4 Microcontroller
5 Electrical isolation
6 One non-volatile memory each in the measuring cell and electronics
7 PROFIBUS-PA interface
8 Three input keys (local operation)
9 Digital display
10 Power supply
11 DP/PA coupler or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

Function diagram of electronics

The input pressure is converted into an electrical signal by the sensor (1). This signal is amplified by the measuring amplifier (2) and digitalized in an analog-to-digital converter (3). The digital signal is analyzed in a microcontroller (4) and corrected according to linearity and thermal characteristics. It is then made available at the PROFIBUS PA over an electrically isolated PROFIBUS PA interface (7). The data specific to the measuring cell, the electronic data and parameter settings are stored in two non-volatile memories (6). The first memory is linked to the measuring cell, the second to the electronics.

The buttons (8) can be used to call up individual functions, so-called modes. If you have a device with a digital display (9), you can use this to track mode settings and other messages. The basic mode settings (12) can be changed with a computer over the bus master.

Operation of electronics with FOUNDATION Fieldbus communication



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

Function diagram of electronics

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

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

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

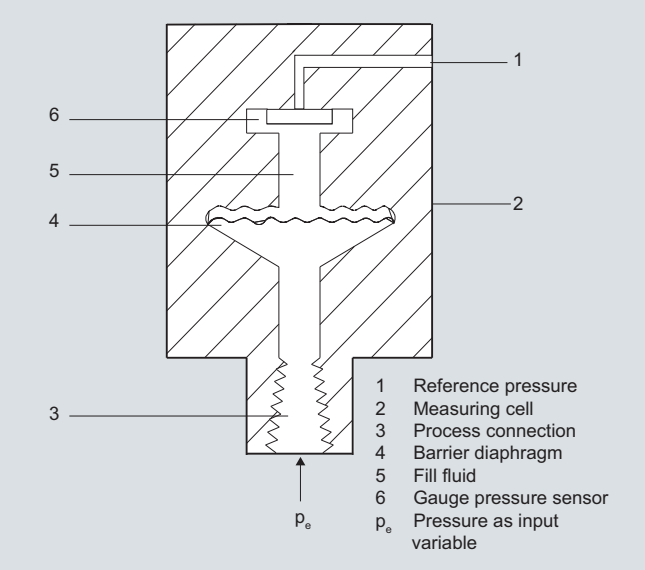
The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

Mode of operation of the measuring cells

The process connections available include the following:

- G½
- ½-14 NPT
- Flush-mounted diaphragm:
  - Flanges to EN
  - Flanges to ASME
  - NuG and pharmaceutical connections

Measuring cell for gauge pressure

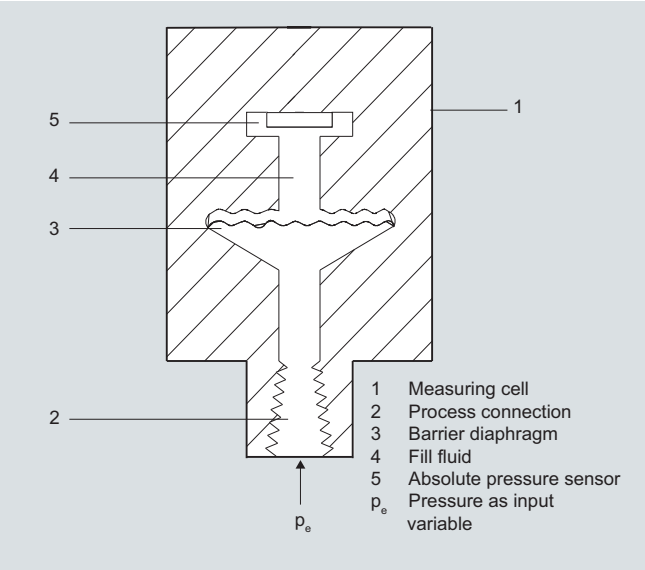


Measuring cell for gauge pressure, function diagram

The input pressure (p_e) is transferred to the gauge pressure sensor (6) via the barrier diaphragm (4) and the fill fluid (5), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

The transmitters with spans ≤ 926.1 psi (≤ 63 bar) measure the input pressure against atmosphere, those with spans ≥ 2352 psi (≥ 160 bar) against vacuum.

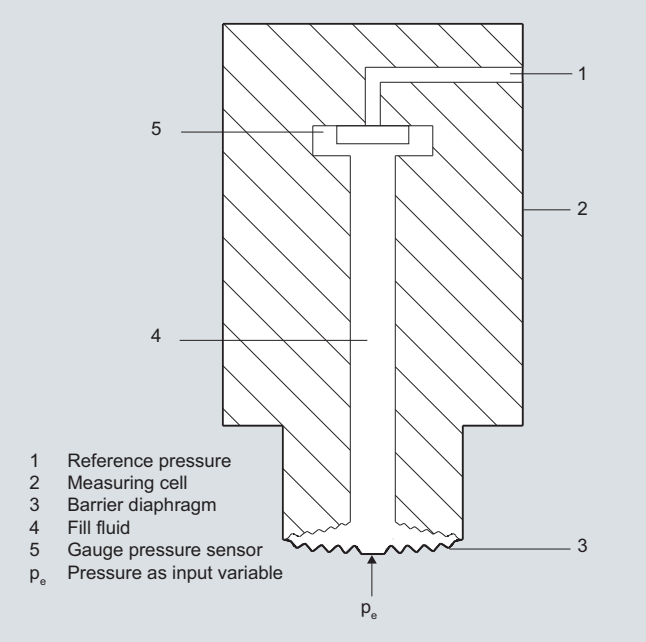
Measuring cell for absolute pressure



Measuring cell for absolute pressure, function diagram

The input pressure (p_e) is transferred to the absolute pressure sensor (5) via the barrier diaphragm (3) and the fill fluid (4), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Measuring cell for gauge pressure, front-flush diaphragm

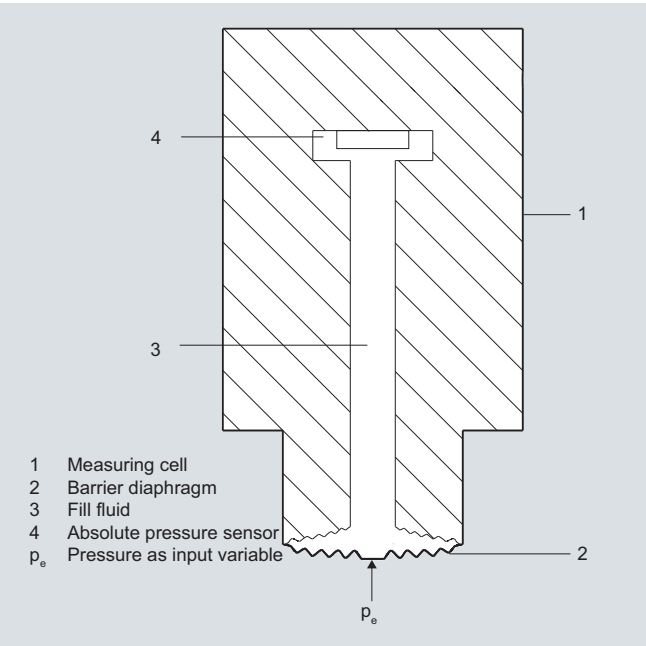


Measuring cell for gauge pressure, front-flush diaphragm, function diagram

The input pressure (p_e) is transferred to the gauge pressure sensor (6) via the barrier diaphragm (4) and the fill fluid (5), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

The transmitters with spans ≤ 926.1 psi (≤ 63 bar) measure the input pressure against atmosphere, those with spans ≥ 2352 psi (≥ 160 bar) against vacuum.

Measuring cell for absolute pressure, front-flush diaphragm



Measuring cell for absolute pressure, front-flush diaphragm, function diagram

SITRANS P300
for gauge and absolute pressure

The input pressure (p_e) is transferred to the absolute pressure sensor (5) via the barrier diaphragm (3) and the fill fluid (4), displacing its measuring diaphragm. The displacement changes the resistance value of the four piezo resistors in the measuring diaphragm in a bridge circuit. The change in the resistance causes a bridge output voltage proportional to the input pressure.

Parameterization

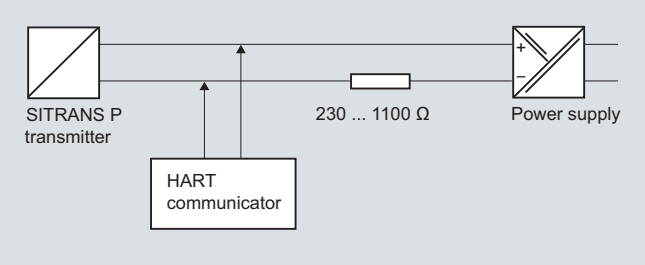
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the pushbuttons (local operation)

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

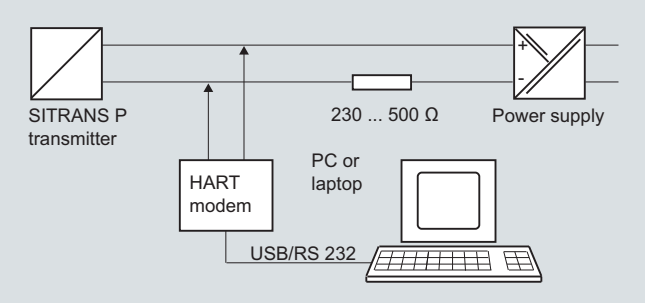
Parameterization using HART communication

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



Communication between a HART communicator and a pressure transmitter

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



HART communication between a PC communicator and a pressure transmitter

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

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

Adjustable parameters on SITRANS P300 with HART communication

Parameters	Pushbuttons	HART communication
Start of scale	x	x
Full-scale value	x	x
Electrical damping	x	x
Start-of-scale value without application of a pressure ("Blind setting")	x	x
Full-scale value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
Current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x[1)]
Linear or sqare root outputs	x	x
Characterizer setup		x
Freely-programmable LCD		x
Diagnostic functions		x

[1)] Cancel apart from write protection

Diagnostic functions for SITRANS P300 with HART communication

- Zero correction for position
- Event counter
- Transmitter output alarms
- Saturation alarm
- Min/Max registers
- Simulation functions
- Maintenance timer

Available physical units of display for SITRANS P300 with HART communication

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_2O, inH_2O (4 °C), mmH_2O, ftH_2O (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
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 connects the SITRANS P300 PA to a process control system, e.g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

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

Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the P300 is connected to a process control system. Communication is possible even in a potentially explosive environment.

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

Adjustable parameters for SITRANS P300 PA and FF

Adjustable parameters	Push-buttons	PROFIBUS PA and FOUNDATION Fieldbus interface
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Buttons and/or function disabling	x	x
Source of measured-value display	x	x
Physical dimension of display	x	x
Position of decimal point	x	x
Bus address	x	x
Linear or sqare root outputs	x	x
Characterizer setup		x
Freely-programmable LCD		x
Diagnostic functions		x

Diagnostic functions for SITRANS P300 PA and FF

- Event counter
- Min/Max registers
- Maintenance timer
- Simulation functions
- Zero correction for position
- Transmitter output alarms
- Saturation alarm

Physical dimensions available for the display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Mpa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm^2, kg/cm^2, mmH_2O, mmH_2O (4 °C), inH_2O, in$H_2$0 (4 °C), ftH_2O (20 °C), mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Mass	g, kg, t, lb, Ston, Lton, oz
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	%

Sanitary version

In the case of the SITRANS P300 with 7MF812.-... front-flush diaphragm, selected connections comply with the requirements of the EHEDG or 3A. You will find further details in the order form. Please note in particular that the seal materials used must comply with the requirements of 3A. Similarly, the filling liquids used must be FDA-compliant.

Technical specifications

SITRANS P300 for gauge and absolute pressure

	HART		PROFIBUS PA and FOUNDATION Fieldbus	
Gauge pressure input				
Measured variable	Gauge pressure			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span (min. ... max.)	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.15 ... 14.5 psi (0.01 ... 1 bar)	87 psi (6 bar)	14.5 psi (1 bar)	87 psi (6 bar)
	0.58 ... 58 psi (0.04 ... 4 bar)	145 psi (10 bar)	58 psi (4 bar)	145 psi (10 bar)
	2.3 ... 232 psi (0.16 ... 16 bar)	464 psi (32 bar)	232 psi (16 bar)	464 psi (32 bar)
	9.1 ... 914 psi (0.6 ... 63 bar)	1450 psi (100 bar)	914 psi (63 bar)	1450 psi (100 bar)
	23.2 ... 2321 psi (1.6 ... 160 bar)	3626 psi (250 bar)	2321 psi (160 bar)	3626 psi (250 bar)
	58 ... 5802 psi (4.0 ... 400 bar)	8700 psi (600 bar)	5802 psi (400 bar)	8700 psi (600 bar)
	Depending on the process connection, the span may differ from these values		Depending on the process connection, the nominal measuring range may differ from these values	
Lower measuring limit				
• Measuring cell with silicone oil	0.44 psi a (30 mbar a)			
Upper measuring limit				
• Measuring cell with silicone oil	100% of max. span		100 % of the max. nominal measuring range	
Absolute pressure input				
Measured variable	Absolute pressure			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span (min. ... max.)	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.12 ... 3.6 psi a (8 ... 250 mbar a)	87 psi a (6 bar a)	3.6 psi a (250 mbar a)	87 psi a (6 bar a)
	0.62 ... 19 psi a (0.043 ... 1.30 bar a)	145 psi a (10 bar a)	19 psi a (1.30 bar a)	145 psi a (10 bar a)
	2.3 ... 73 psi a (0.16 ... 5 bar a)	435 psi a (30 bar a)	73 psi a (5 bar a)	435 psi a (30 bar a)
	14.5 ... 435 psi a (1 ... 30 bar a)	1450 psi a (100 bar a)	435 psi a (30 bar a)	1450 psi a (100 bar a)
Lower measuring limit				
• Measuring cell with silicone oil	0 psia (0 mbar a)			
Upper measuring limit				
• Measuring cell with silicone oil	100% of max. span		100 % of the max. nominal measuring range	
Input of gauge pressure, with front-flush diaphragm				
Measured variable	Gauge pressure, front-flush			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span (min. ... max.)	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.15 ... 14.5 psi (0.01 ... 1 bar)	87 psi (6 bar)	14.5 psi (1 bar)	87 psi (6 bar)
	0.58 ... 58 psi (0.04 ... 4 bar)	145 psi (10 bar)	58 psi (4 bar)	145 psi (10 bar)
	2.32 ... 232 psi (0.16 ... 16 bar)	464 psi (32 bar)	232 psi (16 bar)	464 psi (32 bar)
	9.14 ... 914 psi (0.6 ... 63 bar)	1450 psi (100 bar)	914 psi (63 bar)	1450 psi (100 bar)
Lower measuring limit	1.45 psia (100 mbar a)			
Upper measuring limit				
• Measuring cell with silicone oil	100% of max. span		100 % of the max. nominal measuring range	

SITRANS P300 for gauge and absolute pressure						
	HART			PROFIBUS PA and FOUNDATION Fieldbus		
Input of absolute pressure, with front-flush diaphragm						
Measured variable	Absolute pressure, front-flush					
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span (min. ... max.)	Max. perm. test pressure		Nominal measuring range	Max. perm. test pressure	
	0.62 ... 18.9 psia (43 ... 1300 mbar a)	145 psia (10 bar a)		18.9 psia (1300 mbar a)	145 psia (10 bar a)	
	2.32 ... 72.5 psia (0.16 ... 5 bar a)	435 psia (30 bar a)		72,5 psia (5 bar a)	435 psia (30 bar a)	
	14.5 ... 435 psia (1 ... 30 bar a)	1450 psia (100 bar a)		435 psia (30 bar a)	1450 psia (100 bar a)	
	Depending on the process connection, the span may differ from these values			Depending on the process connection, the nominal measuring range may differ from these values		
Lower measuring limit	0 psi a (0 bar a)					
Upper measuring limit						
• Measuring cell with silicone oil	100% of max. span			100 % of the max. nominal measuring range		
Output						
Output signal	4 ... 20 mA			Digital PROFIBUS PA signal		
Physical bus	-			IEC 61158-2		
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.					
Electrical damping T_{63} (step width 0.1 s)	Set to 0.1 s (0 ... 100 s)					
Measuring accuracy	as per IEC 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, measuring cell with silicone oil, room temperature 25 °C (77 °F), span ratio (r = max. span / set span)					
Error in measurement at limit setting incl. hysteresis and reproducibility						
	Gauge pressure	Absolute pressure	Absolute pressure, front-flush	Gauge pressure	Absolute pressure	Absolute pressure, front-flush
Linear characteristic				≤ 0.075 %	≤ 0.1 %	≤ 0.2 %
• r + 10	≤ (0.0029 · r + 0.071) %	≤ 0.1 %	≤ 0.2 %			
• 10 < r ≤ 30	≤ (0.0045 · r + 0.071) %	≤ 0.2 %	≤ 0.4 %			
• 30 < r ≤ 100	≤ (0.005 · r + 0.05) %	-	-			
Step reponse time T_{63}	approx. 0.2 s					
Long-term stability at ±30 °C (±54 °F)	≤ (0.25 · r) %/5 years	≤ (0.1 · r) %/year		≤ 0.25 %/5 years	≤ 0.1 %/year	
Influence of ambient temperature						
• at -10 ... +60 °C (14 ... 140 °F)	≤ (0.08· r + 0.1) %[1]		≤ (0.2 · r + 0 3) %	≤ 0.3 %		≤ 0.5 %
• at -40 ... -10 °C and +60 ... +85 °C (-40 ... 14 °F and 140 ... 185 °F)	≤ (0.1 · r + 0.15) %/10 K		≤ (0.2 · r + 0.3) %/10 K	≤ 0.25 %/10 K		≤ 0.5 %/10 K
Influence of the medium temperature (only with front-flush diaphragm)						
• Temperature difference between medium temperature and ambient temperature	0.04 psi/10 K (3 mbar/10 K)					

2

SITRANS P300 for gauge and absolute pressure	HART	PROFIBUS PA and FOUNDATION Fieldbus
Rated conditions		
Installation conditions		
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 (FDA-compliant, 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)
• Display readable		-30 ... +85 °C (-22 ... +185 °F)
• Storage temperature		-50 ... +85 °C (-58 ... +185 °F) (for Neobee: -20 ... +85 °C (-4 ... +185 °F))
Climatic class		
Condensation		Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics
Degree of protection acc. 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		Acc. to EN 61326 and NAMUR NE 21
Medium conditions		
Temperature of medium		
• 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 (FDA-compliant, with front-flush diaphragm)		-10 ... +150 °C (-14 ... +302 °F)
• Measuring cell with silicone oil, with temperature decoupler (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 (standard version)		
Weight (without options)		Approx. 800 g (1.8 lb)
Enclosure material		Stainless steel, mat. no. 1.4301/304
Material of parts in contact with the medium		
• Connection shank		Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819
• 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 •Inert filling liquid
Process connection		•G½B to EN 837-1 •Female thread ½-14 NPT •Oval flange PN 160 (MAWP 2320 psi) with fastening thread: -$^{7}_{16}$-20 UNF to IEC 61518 -M10 as per DIN 19213
Design (version with front-flush diaphragm)		
Weight (without options)		approx. 1 ... 13 kg (2.2 ... 29 lb)
Enclosure material		Stainless steel, mat. no. 1.4301/304
Material of parts in contact with the medium		
• Process connection		Stainless steel, mat. no. 1.4404/316L
• Seal diaphragm		Stainless steel, mat. no. 1.4404/316L
• Measuring cell filling		•Silicone oil •Inert filling liquid •FDA compliant fill fluid (Neobee oil)
Process connection		•Flanges as per EN and ASME •F&B and pharmaceutical flanges
Surface quality touched-by-media		R_a-values ≤ 0.8 µm (32 µ-inch)/welds $R_{a)}$ ≤ 1.6 µm (64 µ-inch) (Process connections acc. to 3A; R_a-values ≤ 0.8 µm (32 µ-inch)/welds R_a ≤ 0.8 µm (32 µ-inch)

SITRANS P300 for gauge and absolute pressure		
	HART	**PROFIBUS PA and FOUNDATION Fieldbus**
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 42 V DC for intrinsically safe operation: 10.5 ... 30 V DC	Supplied through bus
Separate power supply	-	Not necessary
Bus voltage		
• Without EEx	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Max. basic current	-	12.5 mA
• Start-up current ≤ basic current	-	Yes
• Max. fault current in the event of a fault	-	15.5 mA
Fault disconnection electronics (FDE)	-	Available
Certificates and approvals		
Classification according to PED 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)	
Water, waste water	In preparation	
Explosion protection		
Intrinsic safety "i"	PTB 05 ATEX 2048	
• Marking	Ex II 1/2 G EEx ia/ib IIB/IIC T4, T5, T6	
• Permissible ambient temperature		
- Temperature class T4	-40 ... +85 °C (-40 ... +185 °F)	
- Temperature class T5	-40 ... +70 °C (-40 ... +158 °F)	
- Temperature class T6	-40 ... +60 °C (-40 ... +140 °F)	
• Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	To certified intrinsically-safe circuits with peak values: FISCO supply unit: U_i = 17.5 V, I_i = 380 mA, P_i = 5.32 W Linear barrier: U_i = 24 V, I_i = 250 mA, P_i = 1.2 W
• Effective inner capacitance:	C_i = 6 nF	C_i = 1.1 nF
• Effective internal inductance:	L_i = 0.4 mH	L_i ≤ 7 µH
Explosion protection to FM for USA and Canada (cFM_{US})		
• Identification (DIP) or (IS); (NI)	Certificate of Compliance 3025099 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	
• Identification (DIP) or (IS)	Certificate of Compliance 3025099C CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC 4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	
Dust explosion protection for zone 20/21/22	PTB 05 ATEX 2048	
• Marking	Ex II 1D Ex ia D 20 T 120 °C Ex II 2D Ex ib D 21 T 120 °C Ex II 3D Ex ib D 21 T 120 °C	
• Permissible ambient temperature		
- Temperature class T4	-40 ... +85 °C (-40 ... +185 °F) (in the case of mineral glass windows only -20 ... +85 °C (-4 ... +185 °F))	
- Temperature class T5	-40 ... +70 °C (-40 ... +158 °F) (in the case of mineral glass windows only -20 ... +70 °C (-4 ... +158 °F))	
- Temperature class T6	-40 ... +60 °C (-40 ... +140 °F) (in the case of mineral glass windows only -20 ... +60 °C (-4 ... +140 °F))	
• Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW	To certified intrinsically-safe circuits with peak values: U_i = 24 V, I_i = 380 mA, P_i = 5.32 mW
• Effective inner capacitance:	C_i = 6 nF	C_i = 5 nF
• Effective internal inductance:	L_i = 0.4 µH	L_i = 10 µH

SITRANS P300 for gauge and absolute pressure		
	HART	**PROFIBUS PA and FOUNDATION Fieldbus**
Type of protection Ex nA/nL/ic (Zone 2)	PTB 05 ATEX 2048	
• Marking	II 2/3 G Ex ic IIB/IIC T4/T5/T6 II 2/3 G Ex nA T4/T5/T6 II 2/3 G Ex nL IIB/IIC T4/T5/T6	
• Permissible ambient temperature		
- Temperature class T4	-40 ... +85 °C (-40 ... +185 °F) (in the case of mineral glass windows only -20 ... +85 °C (-4 ... +185 °F))	
- Temperature class T5	-40 ... +70 °C (-40 ... +158 °F) (in the case of mineral glass windows only -20 ... +70 °C (-4 ... +158 °F))	
- Temperature class T6	-40 ... +60 °C (-40 ... +140 °F) (in the case of mineral glass windows only -20 ... +60 °C (-4 ... +140 °F))	
• Ex nA connection	To certified intrinsically-safe circuits with peak values: U_m = 45 V	To certified intrinsically-safe circuits with peak values: U_m = 32 V
• Ex ic/nL connection	To certified intrinsically-safe circuits with peak values: U_i = 45 V	To certified intrinsically-safe circuits with peak values: U_i = 32 V
• Effective inner capacitance:	C_i = 6 nF	C_i = 5 nF
• Effective internal inductance:	L_i = 0.4 mH	L_i = 20 µH

[1] Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.064 . r + 0.08) %/28 °C (50 °F).

HART communication	
HART	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting Address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0.1 or 2 (totalizer mode and reset function for dosing)
• Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 … 100 s
- Simulation function	Input /Output
- Failure function	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Characterizer	Max. 30 points
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

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

SITRANS P300
for gauge and absolute pressure

Selection and Ordering data			Order No.
SITRANS P300 pressure transmitters for relative and absolute pressure, single-chamber measuring housing, rating plate inscription in English			
4 ... 20 mA/HART			7MF8023-
PROFIBUS PA			7MF8024-
FOUNDATION Fieldbus (FF)			7MF8025-
Measuring cell filling	**Measuring cell cleaning**		
Silicone oil	normal		1
Inert liquid	Cleanliness level 2 to DIN 25410		3
Max. span (min. ... max.)			
0.15 ... 14.5 psi	(0.01 ... 1 bar)		B
0.58 ... 58 psi	(0.04 ... 4 bar)		C
2.32 ... 232 psi	(0.16 ...16 bar)		D
9.14 ... 914 psi	(0.63 ... 63 bar)		E
23.2 ... 2320 psi	(1.6 ... 160 bar)		F
58 ... 5802 psi	(4 ... 400 bar)		G
0.036 ... 3.63 psia	(2.5 ... 250 mbar a)	F)	Q
0.19 ... 18.9 psia	(13 ... 1300 mbar a)	F)	N
0.7 ... 72.5 psia	(0.05 ... 5 bar a)	F)	T
4.35 ... 435 psia	(0.3 ... 30 bar a)	F)	U
Wetted parts materials			
Seal diaphragm	Measuring cell		
Stainless steel	Stainless steel		A
Hastelloy	Stainless steel	F)	B
Hastelloy	Hastelloy	F)	C
Version for diaphragm seal[1)2)]			Y
Process connection			
• G½B to EN 837-1			0
• ½-14 NPT			1
• Stainless steel oval flange			
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518			2
- Mounting thread M10 to DIN 19213			3
- Mounting thread M12 to DIN 19213			4
• Male thread M20 x 1.5			5
• Male thread ½ -14 NPT			6
Non-wetted parts materials			
• Stainless steel, deep-drawn and electrolytically polished			4
Version			
• Standard versions			1
Harzardous Area Rating			
• General Purpose			A
• ATEX, Hazardous Approval			
- "Intrinsic safety (EEx ia)"			B
• FM/CSA Hazardous approval - "Instrinsically safe and explosion proof (is + xp)"			M J
Electrical connection / cable entry			
• Screwed gland M20x1.5 (polyamide)[3)]			A
• Screwed gland M20x1.5 (metal)			B
• Screwed gland M20x1.5 (stainless steel)			C
• M20 connectors (stainless steel), without cable			G
• ½-14 NPT stainless steel thread [4)]			J

Selection and Ordering data	Order No.
SITRANS P300 pressure transmitters for relative and absolute pressure, single-chamber measuring housing, rating plate inscription in English	
4 ... 20 mA/HART	7MF8023-
PROFIBUS PA	7MF8024-
FOUNDATION Fieldbus (FF)	7MF8025-
Indicator	
• Without display, with keys, closed lid[3)]	1
• With display and keys, closed lid	2
• With display and keys, lid with plastics (Makrolon) pane (setting on HART devices: mA, on PROFIBUS devices: pressure units)	4
• With display and keys, lid with plastics (Makrolon) pane (setting acc. to specifications, Order code "Y21" or "Y22" required)	5
• With indicator (digital display visible, setting: mA)	6
• With indicator (digital display visible, setting as specified, Order code "Y21" or "Y22" required)	7

Power supply units see Chap. 8 "Supplementary Components".

Included in delivery of the device:
- Brief instructions (Leporello)
- CD-ROM with detailed documentation

1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

2) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

3) Only together with HART electronics.

4) Without cable gland.

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

Selection and Ordering data		Order No.
SITRANS P300 pressure transmitters for relative and absolute pressure with front-flush membrane, single-chamber measuring housing, rating plate inscription in English		
4 ... 20 mA/HART	F)	**7MF8123-**
PROFIBUS PA	F)	**7MF8124-**
FOUNDATION Fieldbus (FF)	F)	**7MF8125-**
		■■■■■-■■■■
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	**1**
Inert liquid	Cleanliness level 2 to DIN 25410	**3**
FDA compliant fill fluid		
• Neobee oil	normal	**4**
Max. span (min. ... max.)		
0.15 ... 14.5 psi	0.01 ... 1 bar	**B**
0.58 ... 58 psi	0.04 ... 4 bar	**C**
2.32 ... 232 psi	0.16 ... 16 bar	**D**
9.14 ... 914 psi	0.63 ... 63 bar	**E**
0.19 ... 18.9 psia[1]	13 ... 1300 mbar a[1]	**S**
0.7 ... 72.5 psia[1]	0.05 ... 5 bar a[1]	**T**
4.35 ... 435 psia[1]	0.03 ... 30 bar a[1]	**U**
Wetted parts materials		
Seal diaphragm	Measuring cell	
Stainless steel	Stainless steel	**A**
Hastelloy[2]	Stainless steel	**B**
Process connection		
• Flange version with Order Code M.., N.., R.. or Q.. (see "Further designs")		**7**
Non-wetted parts materials		
• Stainless steel, deep-drawn and electrolytically polished		**4**
Version		
• Standard versions		**1**
Harzardous Area Rating		
• General Purpose		**A**
• ATEX, Hazardous Approval		
- "Intrinsic safety (EEx ia)"		**B**
• FM/CSA Hazardous approval		**M**
- "Instrinsically safe and explosion proof (is + xp)"		**J**
Electrical connection / cable entry		
• Screwed gland M20x1.5 (polyamide)[3]		**A**
• Screwed gland M20x1.5 (metal)		**B**
• Screwed gland M20x1.5 (stainless steel)		**C**
• M20 connectors (stainless steel), without cable		**G**
• ½-14 NPT stainless steel thread [4]		**J**

Selection and Ordering data		Order No.
SITRANS P300 pressure transmitters for relative and absolute pressure with front-flush membrane, single-chamber measuring housing, rating plate inscription in English		
4 ... 20 mA/HART	F)	**7MF8123-**
PROFIBUS PA	F)	**7MF8124-**
FOUNDATION Fieldbus (FF)	F)	**7MF8125-**
		■■■■■-■■■■
Indicator		
• Without display, with keys, closed lid[5]		**1**
• With display and keys, closed lid		**2**
• With display and keys, lid with plastics (Makrolon) pane (setting on HART devices: mA, on PROFIBUS devices: pressure units)		**4**
• With display and keys, lid with plastics (Makrolon) pane (setting acc. to specifications, Order code "Y21" or "Y22" required)		**5**
• With indicator (digital display visible, setting: mA)		**6**
• With indicator (digital display visible, setting as specified), Order code "Y21" or "Y22" required		**7**

Power supply units see Chap. 8 "Supplementary Components".

Included in delivery of the device:
- Brief instructions (Leporello)
- CD-ROM with detailed documentation

1) Not with temperature decoupler P00 and P10, not for process connections R01, R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.
2) Only possible for flange with M.., N.. and Q.. option.
3) Only together with HART electronics.
4) Without cable gland.
5) Only together with HART electronics.

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

SITRANS P300
for gauge and absolute pressure

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
Pressure transmitter with mounting bracket (2 shackles, 4 nuts, 4 U-plates, 1 angle) made of: made completely of stainless steel, for wall or pipe mounting	**A02**	✓	✓	✓
Rating plate inscription (instead of English)				
• German	**B10**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
English rating plate Pressure units in inH_20 and/or psi	**B21**	✓	✓	✓
Factory calibration certificate	**C11**	✓	✓	✓
Material traceability certification	**C12**	✓	✓	✓
Factory certificate of conformance	**C14**	✓	✓	✓
Degree of protection IP68 (only for M20x1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Brad Harrison Connector	**D40**	✓	✓	✓
Degree of protection IP6k9k (only for M20x1.5)	**D46**	✓	✓	✓
Ex Approval IEC Ex (EEx ia) (only for transmitter 7MF8...-.....-.B..)	**E45**	✓	✓	✓
Ex Approval EEx ia/ib NEPSI	**E55**	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81..-...)				
Flange to EN 1092-1, Form b1				
• DN 25, PN 40[1)]	**M11**	✓	✓	✓
• DN 25, PN 100[4)]	**M21**	✓	✓	✓
• DN 40, PN 40	**M13**	✓	✓	✓
• DN 40, PN 100	**M23**	✓	✓	✓
• DN 50, PN 16	**M04**	✓	✓	✓
• DN 50, PN 40	**M14**	✓	✓	✓
• DN 80, PN 16	**M06**	✓	✓	✓
• DN 80, PN 40	**M16**	✓	✓	✓
Flanges to ASME B16.5				
• 1", class 150[4)]	**M40**	✓	✓	✓
• 1½", class 150	**M41**	✓	✓	✓
• 2", class 150	**M42**	✓	✓	✓
• 3", class 150	**M43**	✓	✓	✓
• 4", class 150	**M44**	✓	✓	✓
• 1", class 300[4)]	**M45**	✓	✓	✓
• 1½", class 300	**M46**	✓	✓	✓
• 2", class 300	**M47**	✓	✓	✓
• 3", class 300	**M48**	✓	✓	✓
• 4", class 300	**M49**	✓	✓	✓
Threaded connector to DIN 3852-2, form A, thread to ISO 228				
• G ¾"-A, front-flush [2)]	**R01**	✓	✓	✓
• G 1"-A, front-flush [4)]	**R02**	✓	✓	✓
• G 2"-A, front-flush [4)]	**R04**	✓	✓	✓
Tank connection[3)] Sealing is included in delivery				
• TG 52/50, PN 40	**R10**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
Sanitary process connection according DIN 11851 (Dairy connection) Certified to 3A[4)]				
• DN 50, PN 25	**N04**	✓	✓	✓
• DN 80, PN 25	**N06**	✓	✓	✓
Tri-Clamp connection according DIN 32676/ISO 2852 Certified to 3A[4)]				
• DN 50/2", PN 16	**N14**	✓	✓	✓
• DN 65/3", PN 10	**N15**	✓	✓	✓
Varivent connection Certified to 3A and EHEDG[4)]				
• Type N = 68 for Varivent housing DN 40 ... 125 und 1½" ... 6", PN 40	**N28**	✓	✓	✓
Temperature decoupler up to 200 °C[5)] for front-flush diaphragm version	**P00**	✓	✓	✓
Temperature decoupler up to 250 °C Measuring cell filling: High-temperature oil (Silicone oil)	**P10**	✓	✓	✓
Bio-Control sanitary process connection Certified to 3A and EHEDG[4)]				
• DN 50, PN 16	**Q53**	✓	✓	✓
• DN 65, PN 16	**Q54**	✓	✓	✓
• DN 80, PN 16	**Q55**	✓	✓	✓
Sanitary process connection to DRD				
• DN 50, PN 40	**M32**	✓	✓	✓
SMS socket with union nut				
• 2"	**M67**	✓	✓	✓
• 2½"	**M68**	✓	✓	✓
• 3"	**M69**	✓	✓	✓
SMS threaded socket				
• 2"	**M73**	✓	✓	✓
• 2½"	**M74**	✓	✓	✓
• 3"	**M75**	✓	✓	✓
IDF socket with union nut ISO 2853				
• 2"	**M82**	✓	✓	✓
• 2½"	**M83**	✓	✓	✓
• 3"	**M84**	✓	✓	✓
IDF threaded socket ISO 2853				
• 2"	**M92**	✓	✓	✓
• 2½"	**M93**	✓	✓	✓
• 3"	**M94**	✓	✓	✓
Sanitary process connection to NEUMO Bio-Connect screw connection Certified to 3A and EHEDG[4)]				
• DN 50, PN 16	**Q05**	✓	✓	✓
• DN 65, PN 16	**Q06**	✓	✓	✓
• DN 80, PN 16	**Q07**	✓	✓	✓
• DN 100, PN 16	**Q08**	✓	✓	✓
• DN 2", PN 16	**Q13**	✓	✓	✓
• DN 2½", PN 16	**Q14**	✓	✓	✓
• DN 3", PN 16	**Q15**	✓	✓	✓
• DN 4", PN 16	**Q16**	✓	✓	✓
Sanitary process connection to NEUMO Bio-Connect flange connection Certified to 3A and EHEDG[4)]				
• DN 50, PN 16	**Q23**	✓	✓	✓
• DN 65, PN 16	**Q24**	✓	✓	✓
• DN 80, PN 16	**Q25**	✓	✓	✓
• DN 100, PN 16	**Q26**	✓	✓	✓
• DN 2", PN 16	**Q31**	✓	✓	✓
• DN 2½", PN 16	**Q32**	✓	✓	✓
• DN 3", PN 16	**Q33**	✓	✓	✓
• DN 4", PN 16	**Q34**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
Sanitary process connection to NEUMO Bio-Connect clamp connection Certified to 3A and EHEDG[4]				
• DN 50, PN 16	**Q39**	✓	✓	✓
• DN 65, PN 10	**Q40**	✓	✓	✓
• DN 80, PN10	**Q41**	✓	✓	✓
• DN 100, PN 10	**Q42**	✓	✓	✓
• DN 2½", PN 16	**Q48**	✓	✓	✓
• DN 3", PN 10	**Q49**	✓	✓	✓
• DN 4", PN 10	**Q50**	✓	✓	✓
Sanitary process connection to NEUMO Bio-Connect S flange connection Certified to 3A and 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 Certified to 3A and EHEDG				
• 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 Certified to 3A and EHEDG				
• 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 Certified to 3A and EHEDG				
• 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 FormA Certified to 3A and EHEDG				
• DN 50, PN 25	**N53**	✓	✓	✓
• DN 65, PN 25	**N54**	✓	✓	✓
• DN 80, PN 16	**N55**	✓	✓	✓
• DN 100, PN 16	**N56**	✓	✓	✓

1) Special seal in Viton included in the scope of delivery
2) Lower measuring limit -100 mbar g (1.45 psi g).
3) The weldable socket can be ordered under accessories.
4) 3A certification only if used in conjunction with 3A-compliant sealing rings.
5) Certified to 3A.
The maximum permissible temperatures of the medium depend on the respective cell fillings.
6) Preset values can only be changed over SIMATIC PDM

Selection and Ordering data	Order code	HART	PA	FF
Additional data				
Please add "**-Z**" to Order No. and specify Order code(s) and plain text.				
Calibrated range Specify in plain text (max. 5 characters): Y01: X to Y psi, in$H_2$0, ft$H_2$0...	**Y01**	✓		
Tag number/Identification (max. 16 characters), specify in plain text: Y15:	**Y15**	✓	✓	✓
Tag description (max. 27 characters), specify in plain text: Y16:.....	**Y16**	✓	✓	✓
Entry of HART (TAG) (max. 8 characters), specify in plain text: Y17:	**Y17**	✓		
Pressure units for digital display specify in plain text: Y21: psi, in$H_2$0, ft$H_2$0 ...	**Y21**	✓	✓	✓
Non-Pressure units for digital display[6] (measuring range in pressure units ("Y01"/"Y02") mandatory) specify in plain text: Y22: X to Y GPM, MGD, Feet ...	**Y22 + Y01**	✓		
Preset bus address (possible between 1 ... 126) Specify in plain text: Y25:	**Y25**		✓	

Factory mounting of valve manifolds, see accessories.

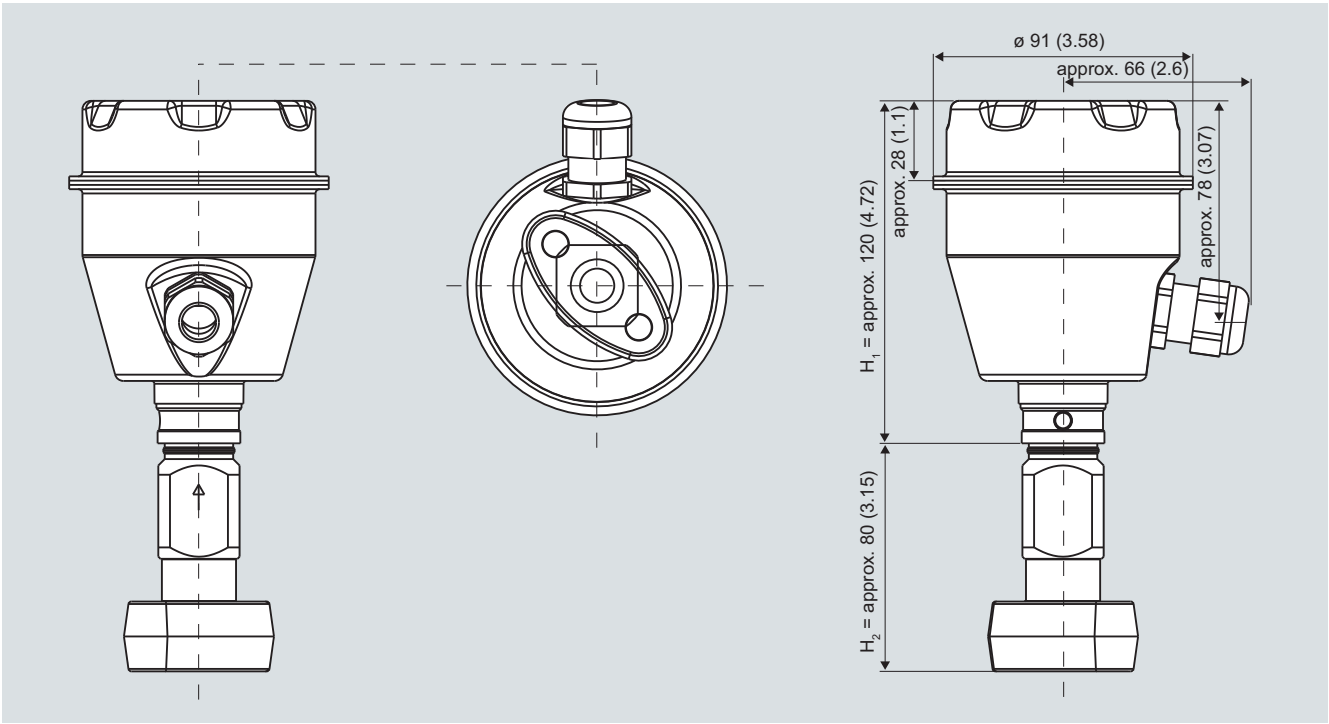
Only "Y01" and "Y21" can be factory preset

✓ = available

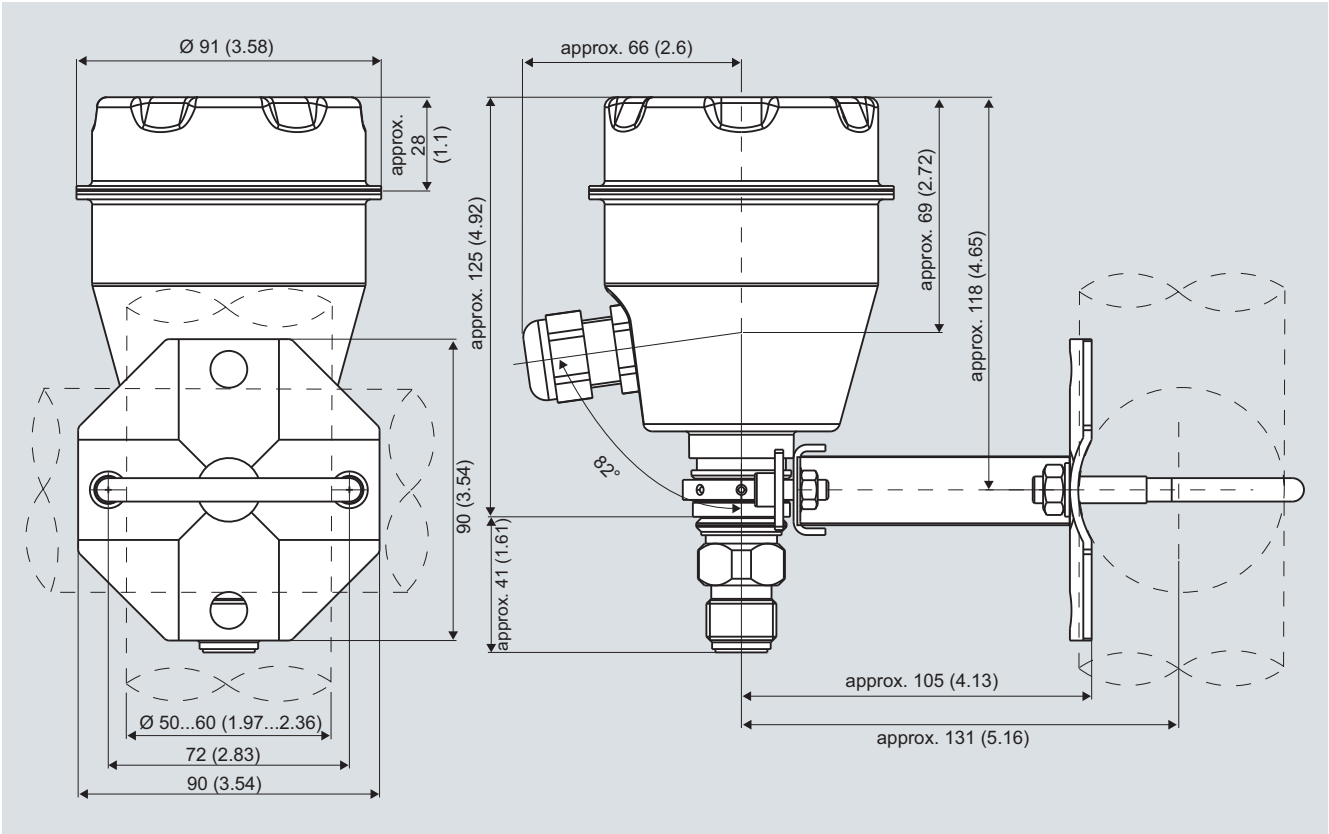
Ordering example

Item line:	7MF8023-1DB24-1AB7-Z
B line:	A02 + Y01 + Y21
C line:	Y01: 0 ... 14,5 psi (0 ... 1 bar)
C line:	Y21: psi (bar)

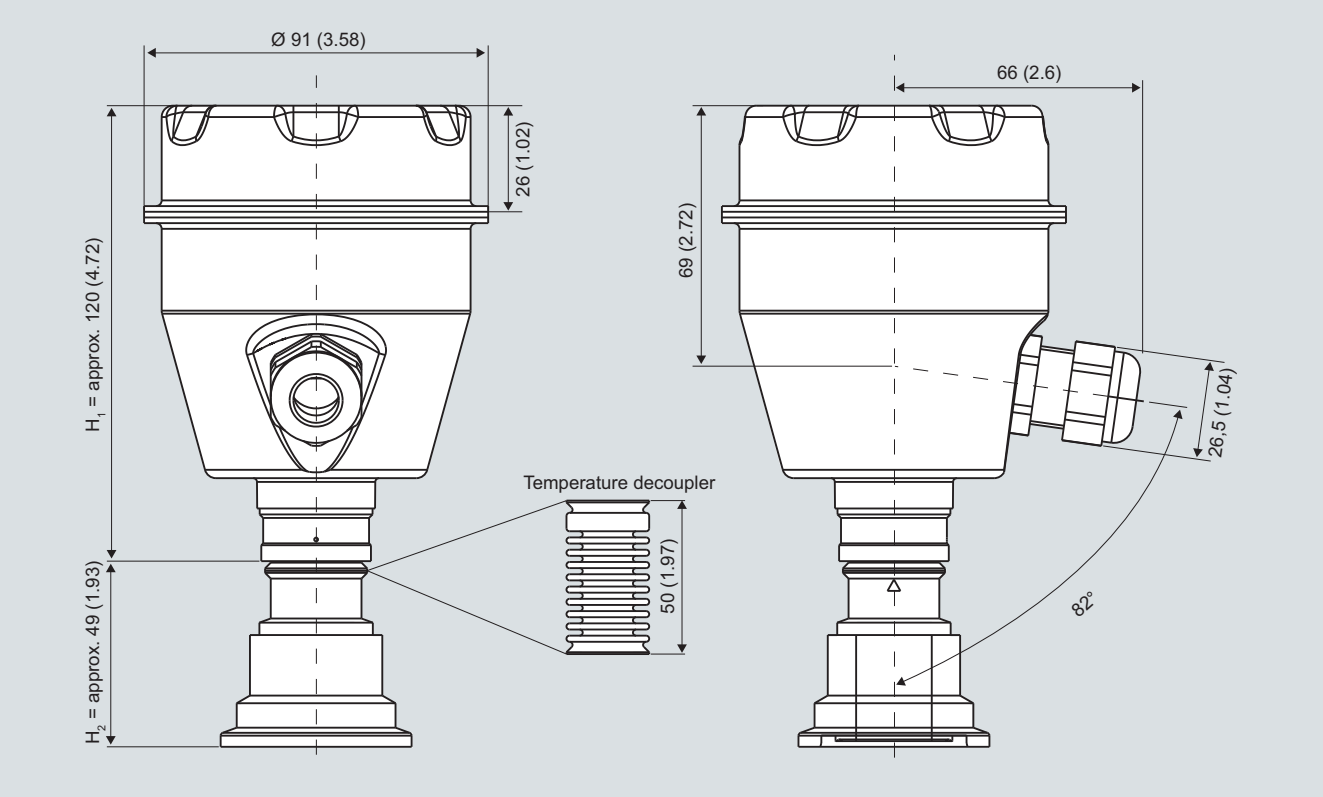
Dimensional drawings



SITRANS P300, with oval flange, dimensions in mm (inch)



SITRANS P300, process connection M20 x 1.5, with mounted mounting bracket, dimensions in mm (inch)



SITRANS P300, front-flush, dimensions in mm (inch)

The diagram shows a SITRANS P300 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 P300 up to a defined cross-section

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

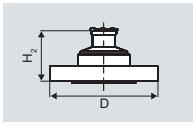
Only the height H_2 is indicated in the dimensions of the flanges.

SITRANS P300
for gauge and absolute pressure

Flanges as per EN and ASME

Flange to EN

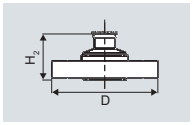
EN 1092-1



DN	PN	∅D	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

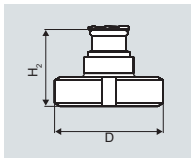


DN	Class	∅D	H_2
1“	150	110 mm (4.3")	Approx. 52 mm (2")
1“	300	125 mm (4.9")	
1½“	150	130 mm (5.1")	
1½“	300	155 mm (6.1")	
2“	150	150 mm (5.9")	
2“	300	165 mm (6.5")	
3“	150	190 mm (7.5")	
3“	300	210 mm (8.1")	
4“	150	230 mm (9.1")	
4“	300	255 mm (10.0")	

NuG and pharmaceutical connections

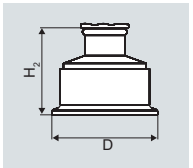
Connections to DIN

DIN 11851 (milk pipe union)



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

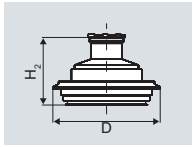
TriClamp to DIN 32676



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

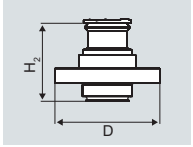
Other connections

Varivent connection



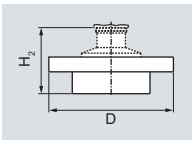
DN	PN	∅D	H_2
40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

Biocontcontrol connection



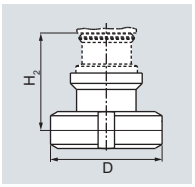
DN	PN	∅D	H_2
50	16	90 mm (3.5")	Approx. 52 mm (2")
65	16	120 mm (4.7")	

Sanitary process connection to DRD



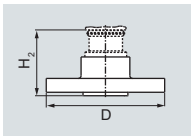
DN	PN	∅D	H_2
50	40	105 mm (4.1")	Approx. 52 mm (2")

Sanitary process screw connection to NEUMO Bio-Connect



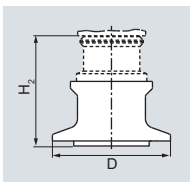
DN	PN	∅D	H_2
50	16	82 mm (3.2")	Approx. 52 mm (2")
65	16	105 mm (4.1")	
80	16	115 mm (4.5")	
100	16	145 mm (5.7")	
2”	16	82 mm (3.2")	
2½”	16	105 mm (4.1")	
3”	16	105 mm (4.1")	
4”	16	145 mm (5.7")	

Sanitary process connection to NEUMO Bio-Connect flange connection



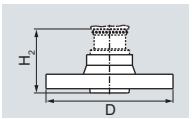
DN	PN	∅D	H_2
50	16	110 mm (4.3")	Approx. 52 mm (2")
65	16	140 mm (5.5")	
80	16	150 mm (5.9")	
100	16	175 mm (6.9")	
2”	16	100 mm (3.9")	
2½”	16	110 mm (4.3")	
3”	16	140 mm (5.5")	
4”	16	175 mm (6.9")	

Sanitary process connection to NEUMO Bio-Connect clamp connection



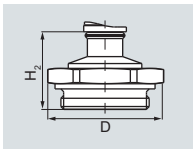
DN	PN	∅D	H_2
50	16	77.4 mm (3.0")	Approx. 52 mm (2")
65	10	90.9 mm (3.6")	
80	10	106 mm (4.2")	
100	10	119 mm (4.7")	
2”	16	64 mm (2.5")	
2½”	16	77.4 mm (3.0")	
3”	10	90.9 mm (3.6")	
4”	10	119 mm (4.7")	

Sanitary process connection to NEUMO Bio-Connect S flange connection



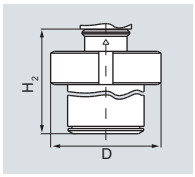
DN	PN	∅D	H_2
50	16	125 mm (4.9")	Approx. 52 mm (2")
65	10	145 mm (5.7")	
80	10	155 mm (6.1")	
100	10	180 mm (7.1")	
2”	16	125 mm (4.9")	
2½”	10	135 mm (5.3")	
3”	10	145 mm (5.7")	
4”	10	180 mm (7.1")	

Threaded connection G¾", G1" and G2" acc. to DIN 3852



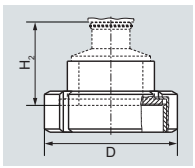
DN	PN	∅D	H_2
¾“	63	37 mm (1.5")	approx. 45 mm (1.8")
1“	63	48 mm (1.9")	approx. 47 mm (1.9")
2“	63	78 mm (3.1")	Approx. 52 mm (2")

Tank connection TG 52/50 and TG52/150



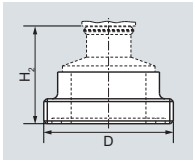
DN	PN	∅D	H_2
25	40	63 mm (2.5")	approx. 63 mm (2.5")
25	40	63 mm (2.5")	approx. 170 mm (6.7")

SMS socket with union nut



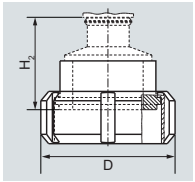
DN	PN	∅D	H_2
2“	25	84 mm (3.3")	Approx. 52 mm (2.1")
2½“	25	100 mm (3.9")	
3“	25	114 mm (4.5")	

SMS threaded socket



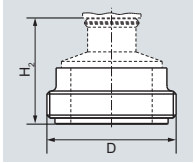
DN	PN	∅D	H_2
2“	25	70 x 1/6 mm	Approx. 52 mm (2.1")
2½“	25	85 x 1/6 mm	
3“	25	98 x 1/6 mm	

IDF socket with union nut



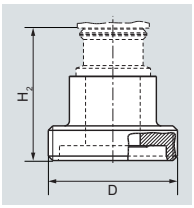
DN	PN	∅D	H_2
2“	25	77 mm (3")	Approx. 52 mm (2.1")
2½“	25	91 mm (3.6")	
3“	25	106 mm (4.2")	

IDF threaded socket



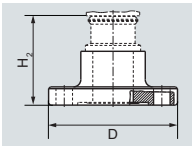
DN	PN	∅D	H_2
2“	25	64 mm (2.5")	Approx. 52 mm (2.1")
2½“	25	77.5 mm (3.1")	
3“	25	91 mm (3.6")	

Aseptic threaded socket to DIN 11864-1 Form A



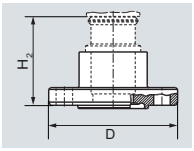
DN	PN	∅D	H_2
50	25	78 x 1/6"	Approx. 52 mm (2.1")
65	25	95 x 1/6"	
80	25	110 x ¼"	
100	25	130 x ¼"	

Aseptic flange with notch to DIN 11864-2 Form A



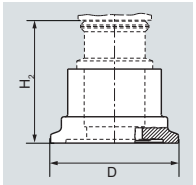
DN	PN	∅D	H_2
50	16	94	Approx. 52 mm (2.1")
65	16	113	
80	16	133	
100	16	159	

Aseptic flange with groove to DIN 11864-2 Form A



DN	PN	∅D	H_2
50	16	94	Approx. 52 mm (2.1")
65	16	113	
80	16	133	
100		159	

Aseptic clamp with groove to DIN 11864-3 Form A



DN	PN	∅D	H_2
50	25	77,5	Approx. 52 mm (2.1")
65	25	91	
80	16	106	
100	16	130	

SITRANS P300
Accessories/Spare parts

Selection and Odering data		Order No.
Spare parts / Accessories		
Mounting bracket and fastening parts kit made of stainless steel		**7MF8997-1AA**
Cover without window gasket not included		**7MF8997-1BA**
Cover with glass window gasket not included		**7MF8997-1BD**
NBR enclosure sealing	F)	**7MF8997-1BG**
Measuring point label unlabeled		**7MF8997-1CA**
Cable gland		
• metal		**7MF8997-1EA**
• plastic (blue)		**7MF8997-1EB**
Weldable sockets for PMC connection		
• PMC Style Standard: Thread 1½"		**7MF4997-2HA**
• PMC Style Minibolt: front-flush 1"		**7MF4997-2HB**
Gaskets for PMC connection (packing unit = 5 units)		
• PTFE seal for PMC Style Standard: Thread 1½"	F)	**7MF4997-2HC**
• Gasket made of Viton for PMC Style Minibolt: front-flush 1"	F)	**7MF4997-2HD**
Weldable socket for TG52/50 and TG52/150 connection		
• TG52/50 connection		**7MF4997-2HE**
• TG52/150 connection02		**7MF4997-2HF**
Seals for TG 52/50 and TG 52/150 made of silicone		**7MF4997-2HG**
Seals for flange connection with front-flush diaphragm Material FPM (Viton), 10 units		
• DN 25, PN 40 (M11)	F)	**7MF4997-2HH**
• DN 25, PN 100 (M21)	F)	**7MF4997-2HJ**
• 1", class 150 (M40)	F)	**7MF4997-2HK**
• 1", class 300 (M45)	F)	**7MF4997-2HL**

Selection and Odering data		Order No.
Operating Instructions[1]		
• for SITRANS P300 series with HART		
- German		**A5E00359580**
- English		**A5E00359579**
- French		**A5E00359578**
- Spanish		**A5E00359576**
- Italian		**A5E00359577**
- Leporello German/English		**A5E00359581**
• for SITRANS P300 series with PROFIBUS PA		
- German		**A5E00414587**
- English		**A5E00414588**
- French		**A5E00414589**
- Spanish		**A5E00414590**
- Italian		**A5E00414591**
- Leporello German/English		**A5E00414592**
CD with documentation for SITRANS P300 and SITRANS DS III		
• German, English, French, Spanish, Italian		**A5E00090345**
Certificates (order only via SAP) instead of Internet download		
• hard copy (to order)		**A5E03252406**
• on CD (to order)		**A5E03252407**
HART modem		
• with RS232 interface	D)	**7MF4997-1DA**
• with USB interface	D)	**7MF4997-1DB**

[1] You can download these operating instructions free-of-charge from our Internet site at www.siemens.de/sitransp.

D) Subject to export regulations AL: N, ECCN: EAR99H

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

Power supply units see Chap. 8 "Supplementary Components".

Overview

The SITRANS P300 transmitter for gauge and absolute pressure can be delivered factory-fitted with the following valve manifolds:

- 7MF9011-4FA valve manifolds for gauge pressure and absolute pressure transmitters

Design

The 7MF9011-4FA valve manifolds are sealed with PTFE sealing tape between the transmitter and the valve manifold.

Once installed, the complete unit is checked under pressure for leaks (compressed air 6 bar (87 psi))and is certified leak-proof with a test report to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the respective mounting brackets. The transmitters are mounted on the valve manifold and not on the unit itself.

If you order a mounting bracket when choosing the option "Factory mounting of valve manifolds", you will receive a mounting bracket for the valve manifold instead of a bracket for mounting the transmitter.

If you order an acceptance test certificate 3.1 to EN 10204 when choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitters and the valve manifolds respectively.

Selection and Ordering data

7MF9011-4FA valve manifold on gauge and absolute pressure transmitters

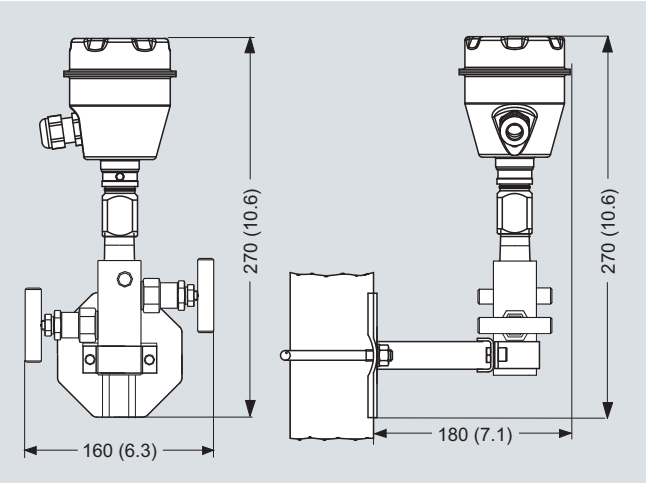
Add **-Z** to the Order No. of the transmitter and add order codes	Order code
SITRANS P300 7MF802.-...1.-...	**T03**
With process connection female thread ½-14 NPT in-sealed with PTFE sealing tape	
Delivery incl. high-pressure test certified by test report to EN 10204-2.2	
Further designs:	
Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)	**A02**
Material traceability certification	**C12**

SITRANS P300 - Factory-mounting of valve manifolds on transmitters

Dimensional drawings

Valve manifold mounted on SITRANS P300

7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters



7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (Inch)

Overview

The SITRANS P300 and DS III pressure transmitters have been fitted with special process connections for the paper industry. With the two process connection threads 1½" and 1" flush at the front, the SITRANS P300 and DS III transmitters can be used for all processes in the paper industry.

SITRANS P300 and SITRANS PDS III series pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameterization is performed using control keys via HART, 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).

Various versions of the pressure transmitters are available for measuring:

- Gauge pressure
- Level
- Mass level
- Volume level

Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads, e.g. abrasion.
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions
- Minimum conformity error
- Small long-term drift
- Wetted parts made of Hastelloy
- Infinitely adjustable spans from 0.43 psi to 232 psi (0.03 bar to 16 bar) for DS III with HART interface
- Nominal measuring range from 14.5 psi to 232 psi (1 bar to 16 bar) for DS III with PROFIBUS PA and FOUNDATION Fieldbus interface
- Infinitely adjustable spans from 0.43 psi to 232 psi (0.03 bar to 16 bar) for SITRANS P300 with HART interface
- Nominal measuring range from 14.5 psi to 232 psi (1 bar to 16 bar) for SITRANS P300 with PROFIBUS PA interface
- High measuring accuracy
- Parameterization over control keys and HART communication, or over PROFIBUS PA or FOUNDATION Fieldbus interface (DS III only).

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 (only DS III).

SITRANS P, DS III series

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

Span (infinitely adjustable)

For DS III with HART: 0.433 ... 232 psi (0.03 ... 16 bar)

Nominal measuring range

For DS III with PROFIBUS PA or FOUNDATION Fieldbus: 14.5 ... 232 psi (1 ... 16 bar)

SITRANS P300

Span (infinitely adjustable)

For P300 with HART: 0.433 ... 232 psi (0.03 ... 16 bar)

Nominal measuring range

For P300 with PROFIBUS PA or FOUNDATION Fieldbus: 14.5 ... 232 psi (1 ... 16 bar)

Design

SITRANS P DS III

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

Device front view, SITRANS P DS III

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

The rating plate (7, Figure "Device 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).

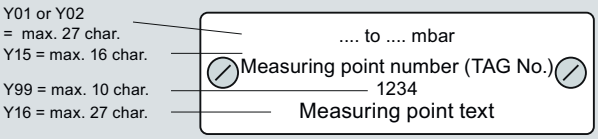
The approval label is located on the opposite side.

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 (2) can be fitted with a viewing pane so that the measured values can be read directly on the digital display. The inlet (8) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the housing.

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the housing contains the measuring cell with process connection (5). The measuring cell is prevented from rotating by a locking screw (4). As the result of this modular design, the measuring cell and the electronics can be replaced separately from each other. The set parameter data are retained.

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

Example of attached measuring points sign



SITRANS P300

The device comprises:

- Electronics
- Housing
- Measuring cell

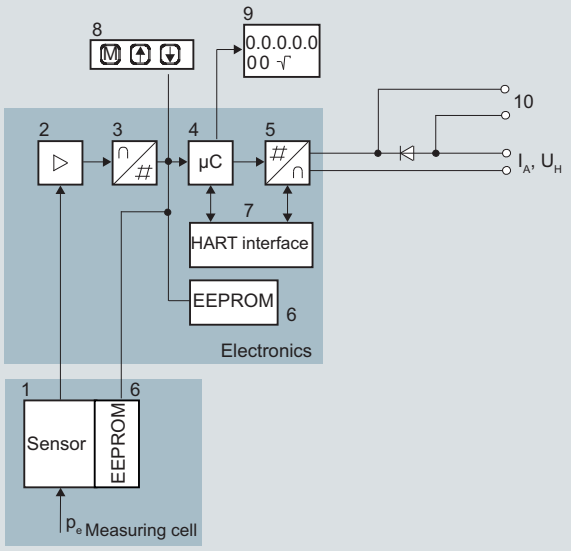
1 Digital display
2 Process connection
3 Cable gland
4 Rating plate
5 Screw-on cover

Perspective view of the SITRANS P300

The housing has a screw-on cover (5) and, depending on the version, is with or without an inspection window. The electrical terminal housing, the buttons for operation of the device are located under this cover and, depending on the version, the digital display. The connections for the auxiliary power UH and the shield are in the terminal housing. The cable gland is on the side of the housing. The measuring cell with the process connection (2) is located on the bottom of the housing. The measuring cell with the process connection may differ from the one shown in the diagram, depending on the device version.

Function

Operation of electronics with HART communication



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

Function diagram of electronics

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

The diode circuit (10) protects against incorrect polarity.

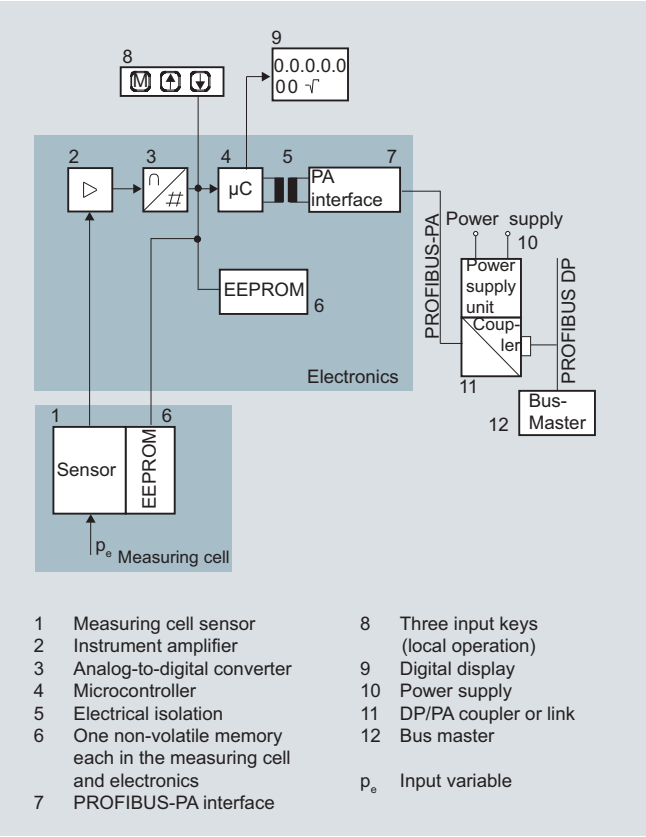
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

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

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

The pressure transmitters with spans ≤ 914 psi (63 bar) measure the input pressure compared to atmosphere, the transmitters with spans 2320 psi (160 bar) measure compared to vacuum.

Operation of electronics with PROFIBUS PA communication



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

Function diagram of electronics

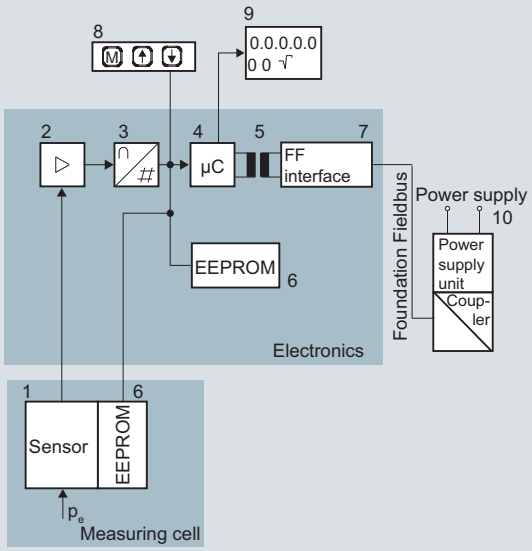
The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier(2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected,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

The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The 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 buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the 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.

Operation of electronics with FOUNDATION Fieldbus communication



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

Function diagram of electronics

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

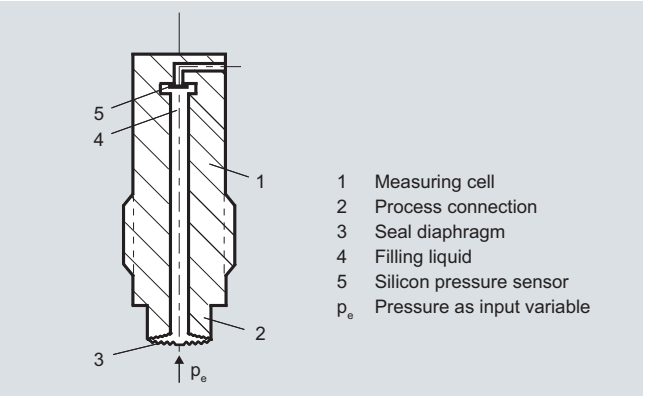
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As a result of this modular design, the electronics and the measuring cell can be replaced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

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

Measuring cell for gauge pressure with front-flush diaphragm



Measuring cell for gauge 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 gauge 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 absolute pressure.

Parameterization

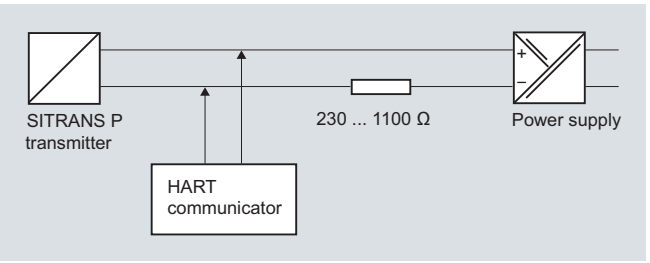
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

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

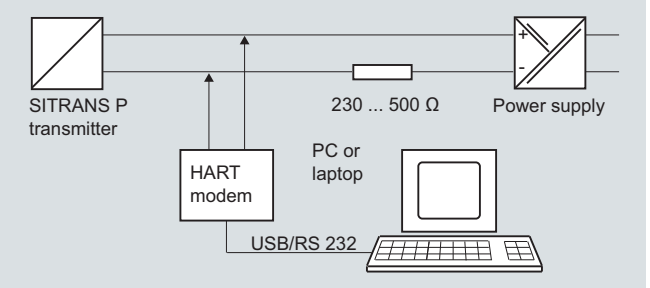
Parameterization using HART

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



Communication between a HART communicator and a pressure transmitter

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



HART communication between a PC communicator and a pressure transmitter

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

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

Adjustable parameter DS III with HART and P300 with HART

Parameters	Pushbuttons	HART communication
Start of scale	x	x
Full-scale value	x	x
Electrical damping	x	x
Start-of-scale value without application of a pressure ("Blind setting")	x	x
Full-scale value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x[1)]
Type of dimension and actual dimension	x	x
Linear or square root output	x	x
Characterizer setup		x
Freely-programmable LCD		x
Diagnostic functions		x

[1)] Cancel apart from write protection

Diagnostic functions for DS III with HART and P300 with HART

- Zero correction for position
- Event counter
- Transmitter output alarms
- Saturation alarm
- Min/Max registers
- Simulation functions
- Maintenance timer

Available physical units of display for DS III HART and P300 HART

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm^2, kg/cm^2, inH$_2$O, inH$_2$O (4 °C), mmH$_2$O, ftH$_2$O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m^3, dm^3, hl, yd^3, ft^3, in^3, US gallon, Imp. gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
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 connects the DS III PA to a process control system, e.g. SIMATIC PSC 7. Communication is possible even in a potentially explosive environment.

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

Parameterization through FOUNDATION Fieldbus interface

Fully digital communication through FOUNDATION Fieldbus is particularly user-friendly. Through the FOUNDATION Fieldbus the DS III 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 with PROFIBUS PA and FOUNDATION Fieldbus, and P300 with PROFIBUS PA and FOUNDATION Fieldbus

Adjustable parameters	Pushbuttons	PROFIBUS PA and FOUNDATION Fieldbus interface
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Buttons and/or function disabling	x	x
Source of measured-value display	x	x
Physical dimension of display	x	x
Position of decimal point	x	x
Bus address	x	x
Linear or square root output	x	x
Characterizer setup		x
Freely-programmable LCD		x
Diagnostic functions		x

Diagnostic functions for DS III with PROFIBUS PA and FOUNDATION Fieldbus, and P300 with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Min/Max registers
- Maintenance timer
- Simulation functions
- Zero correction for position
- Transmitter output alarms
- Saturation alarm

Physical dimensions available for the display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	MPa, hPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm^2, kg/cm^2, mmH$_2$O, mmH$_2$O (4 °C), inH$_2$O, inH$_2$0 (4 °C), ftH$_2$O, mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Mass	g, kg, t, lb, Ston, Lton, oz
Volume	m^3, dm^3, hl, yd^3, ft^3, in^3, US gallon, Imp. gallon, bushel, barrel, barrel liquid
Temperature	K, °C, °F, °R
Miscellaneous	%

SITRANS P DS III with PMC connection

Technical specifications

SITRANS P, DS III series for gauge pressure with PMC connection for the paper industry

	HART		PROFIBUS PA and FOUNDATION Fieldbus	
Input				
Measured variable	Gauge pressure			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span (min. ... max.)	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.15 ... 14.5 psi (0.01 ... 1 bar)	87 psi (6 bar)	14.5 psi (1 bar)	87 psi (6 bar)
	0.58 ... 58 psi (0.04 ... 4 bar)	145 psi (10 bar)	58 psi (4 bar)	145 psi (10 bar)
	2.32 ... 232 psi (0.16 ... 16 bar)	464 psi (32 bar)	232 psi (16 bar)	464 psi (32 bar)
Lower measuring limit				
• Measuring cell with silicone oil filling	1.45 psi a (100 mbar a)			
Upper measuring limit	100% of max. span			
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA and FOUNDATION Fieldbus signal	
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-	
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
Load				
• Without HART communication	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V		-	
• With HART communication	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.			
Measuring accuracy	Acc. to IEC 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 at limit setting incl. hysteresis and reproducibility				
• 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) %			
Long-term stability (temperature change ± 30 °C (± 54 °F))				
1- to 4-bar measuring cell	≤ (0.25 · r) % per 5 years		≤ 0.25 % per 5 years	
16-bar measuring cell	≤ (0.125 · r) % per 5 years		≤ 0.125 % per 5 years	
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)	≤ (0.08 · r + 0.1)%[1)]		≤ 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	
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)			
Influence of mounting position	≤ 0.1 mbar (0.00145 psi) per 10° inclination			
Measured Value Resolution	-		$3 \cdot 10^{-5}$ of nominal measuring range	

SITRANS P, DS III series for gauge pressure with PMC connection for the paper industry		
	HART	**PROFIBUS PA and FOUNDATION Fieldbus**
Rated conditions		
Degree of protection (to IEC 60529)	IP65, IP68, NEMA 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F)	
Temperature of medium	-40 ... +100 °C (-40 ... +212 °F)	
Ambient conditions		
• Ambient temperature	-20 ... +85 °C (-4 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
• Electromagnetic Compatibility		
- Emitted interference and interference immunity	Acc. to EN 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AlSi12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
• Gasket (standard)	PTFE flat gasket	
• O-ring (minibolt)	FPM (Viton) or optionally: FFPM or NBR	
Measuring cell filling	Silicone oil or inert filling liquid	
Process connection (standard)	Flush-mounted, 1½", PMC Standard design	
Process connection (minibolt)	Flush-mounted, 1", minibolt design	
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
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes
Certificates and approvals		
Classification according to PED 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)	

1) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.064 · r + 0.08) %/28 °C (50 °F).

SITRANS P DS III with PMC connection

HART communication	
HART	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Characterizer	Max. 30 points
- Square-rooted characteristic for flow measurement	Yes
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

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

Selection and Ordering data		Order No.
SITRANS P pressure transmitters for gauge pressure, with PMC connection series DS III with HART	F)	**7MF4133-**
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	**1**
Inert liquid	Grease-free to cleanliness level 2	**3**
Measuring span (min. ... max.)		
0.15 ... 14.5 psi[1]	(0,01 ... 1 bar)[1]	**B**
0.58 ... 58 psi	(0.04 ... 4 bar)	**C**
2.32 ... 232 psi	(0.16 ... 16 bar)	**D**
Wetted parts materials		
Seal diaphragm	Connection shank	
Hastelloy	Stainless steel	**B**
Process connection		
• PMC Style Standard: Thread 1½"		**2**
• PMC Style Minibolt: front-flush 1" (not with minimum span: 500 mbar (200 inH_2O) - version "B")		**3**
Non-wetted parts materials		
• Housing made of die-cast aluminium		**0**
• Housing stainless steel precision casting		**3**
Version		
• Standard versions		**1**
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)		**2**
Hazardous area rating		
• General purpose		**A**
• FM/CSA Hazardous approval		
- "Intrinsically Safe und explosion proof (is + xp)"[2]		**NC**
Electrical connection / cable entry		
• Female thread M20 x 1.5		**B**
• Female thread ½-14 NPT		**C**
• M12 connectors (metal)[2]		**F**
Indicator		
• Without indicator		**0**
• Without indicator (digital display hidden, setting: mA)		**1**
• With indicator (digital display visible, setting: mA)		**6**
• With indicator (digital display visible, setting as specified, Order code "Y21"/"Y22" required)		**7**

Power supply units see Chap. 8 "Supplementary Components".

Included in delivery of the device:
- Brief instructions (Leporello)
- CD-ROM with detailed documentation
- sealing ring

1) Only with "PMC Style Standard"process connection

2) M12 delivered without cable socket

Selection and Ordering data		Order No.
SITRANS P pressure transmitter for gauge pressure, with PMC connection		
DS III with PROFIBUS PA (PA)	F)	**7MF4134-**
DS III with FOUNDATION Fieldbus (FF)	F)	**7MF4135-**
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	**1**
Inert liquid	Grease-free to cleanliness level 2	**3**
Nominal measuring range		
14.5 psi[1]	(1 bar)[1]	**B**
58 psi	(4 bar)	**C**
232 psi	(16 bar)	**D**
Wetted parts materials		
Seal diaphragm	Connection shank	
Hastelloy	Stainless steel	**B**
Process connection[2]		
• PMC Style Standard: Thread 1½"		**2**
• PMC Style Minibolt: front-flush 1" (minimum span: 500 mbar (200 inH_2O) not available with 1-bar-measuring cell (Option B))		**3**
Non-wetted parts materials		
• Housing made of die-cast aluminium		**0**
• Housing stainless steel precision casting		**3**
Version		
• Standard versions		**1**
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)		**2**
Hazardous area rating		
• General purpose		**A**
• FM/CSA Hazardous approval		
- "Intrinsically Safe und explosion proof (is + xp)"[3]		**NC**
Electrical connection / cable entry		
• Screwed gland M20x1.5		**B**
• Screwed gland ½-14 NPT		**C**
• M12 connectors (metal)[3]		**F**
Indicator		
• Without indicator		**0**
• Without indicator (digital display hidden, setting: mA)		**1**
• With indicator (digital display visible, setting: mA)		**6**
• With indicator (digital display visible, setting as specified, Order code "Y21" required)		**7**

Included in delivery of the device:
- Brief instructions (Leporello)
- CD-ROM with detailed documentation
- sealing ring

1) Only with "PMC Style Standard"process connection

2) Sealing is included in delivery.

3) M12 delivered without cable socket

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

SITRANS P DS III with PMC connection

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
Plug				
• Angled	**A32**	✓		
• Han 8D (metal, gray)	**A33**	✓		
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
English rating plate Pressure units in inH_20 and/or psi	**B21**	✓	✓	✓
Factory calibration certificate	**C11**	✓	✓	✓
Material traceability certificate	**C12**	✓	✓	✓
Factory certificate of conformance	**C14**	✓	✓	✓
SIL2 certificate per IEC 61508 / 61511	**C20**	✓		
Output signal can be set to upper limit of 22.0mA	**D05**	✓	✓	✓
Brad Harrison Connector	**D40**	✓	✓	✓
External, ½" NPT	**J01**	✓		
Mounting				
• Weldable sockets for standard 1½" threaded connection	**P01**	✓	✓	✓
• Weldable socket for minibolt connection 1" (incl. screw 5/16-18 UNC-2B and washer)	**P02**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Additional data				
Please add "**-Z**" to Order No. and specify Order code(s) and plain text.				
Calibrated range Specify in plain text (max. 5 characters): Y01: X to Y psi, inH_20, ftH_20...	**Y01**	✓		
Tag number/Identification (max. 16 characters), specify in plain text: Y15:	**Y15**	✓	✓	✓
Tag description (max. 27 characters), specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART (TAG) (max. 8 characters), specify in plain text: Y17:	**Y17**	✓		
Pressure units for digital display specify in plain text: Y21: psi, inH_20, ftH_20 ...	**Y21**	✓	✓	✓
Preset bus address possible between 1 and 126 Max. 8 characters, specify in plain text: Y25:	**Y25**		✓	

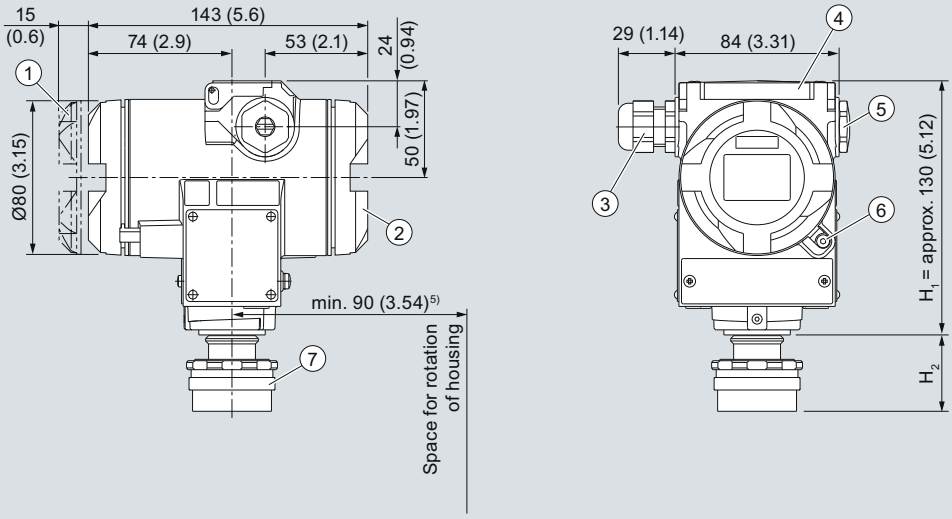
Only "Y01" and "Y21" can be factory preset

✓ = available

Ordering example

Item line:	7MF4133-1DB20-1AB7-Z
B line:	C11 + Y01 + Y21
C line:	Y01: 14.5 ... 145 psi (1 ... 10 bar)
C line:	Y21: psi (bar)

Dimensional drawings



1. Electronic side, digital display (longer overall length for cover with window)[1]
2. Terminal side[1]
3. Electrical connection: Screwed gland M20 x 1,5 or screwed gland ½-14 NPT or M12 conector
4. Protective cover over keys
5. Blanking plug
6. Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
7. Process connection: PMC standard

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

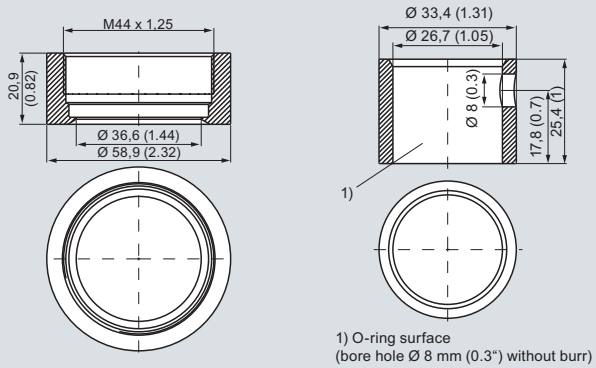
SITRANS P DS III pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

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 P DS III up to a defined cross-section

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

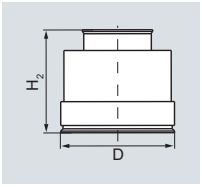
Only the height H_2 is indicated in the dimensions of the flanges.



PMC Style Standard (left) and PMC Style Minibolt (right) weldable sockets, dimensions in mm (inch)

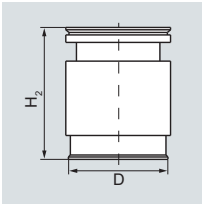
Material: Stainless steel, Mat. No. 1.4404/316L

PMC Style standard



DN	PN	ØD	H_2
		40.9 mm (1.6")	approx. 36.8 mm (1.4")

PMC Style minibolt



DN	PN	ØD	H_2
		26.3 mm (1.0")	approx. 33.1 mm (1.3")

SITRANS P300 with PMC connection

Technical specifications

SITRANS P300 for gauge pressure with PMC connection for the paper industry

	HART		PROFIBUS PA and FOUNDATION Fieldbus	
Input				
Measured variable	Gauge pressure (front-flush)			
Spans (infinitely adjustable) or nominal measuring range and max. pemissible test pressure	Measuring span (min. ... max.)	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.15 ... 14.5 psi (0.01 ... 1 bar)	87 psi (6 bar)	14.5 psi (1 bar)	87 psi (6 bar)
	0.58 ... 58 psi (0.04 ... 4 bar)	145 psi (10 bar)	58 psi (4 bar)	145 psi (10 bar)
	2.3 ... 232 psi (0.16 ... 16 bar)	464 psi (32 bar)	232 psi (16 bar)	464 psi (32 bar)
	Depending on the process connection, the span may differ from these values		Depending on the process connection, the nominal measuring range may differ from these values	
Lower measuring limit				
• Measuring cell with silicone oil	1.45 psi a (100 mbar a)			
Upper measuring limit				
• Measuring cell with silicone oil	100 % of max. span		100 % of the max. nominal measuring range	
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA signal	
Physical bus	-		IEC 61158-2	
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.			
Electrical damping T_{63} (step width 0.1 s)	Set to 0.1 s (0 ... 100 s)			
Measuring accuracy	Acc. to IEC 60770-1			
Reference conditions (All error data always refer to the set span)	Increasing characteristic, start-of-scale value 0 bar, stainless steel seal diaphragm, measuring cell with silicone oil, room temperature 25 °C (77 °F), span ratio (r = max. span / set span)			
Error in measurement at limit setting incl. hysteresis and reproducibility				
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) %			
Step response time T_{63}	approx. 0.2 s			
Long-term stability at ± 30 °C (± 54 °F)	≤ (0.25 · r) %/5 years		≤ 0.25 %/5 years	
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)	≤ (0.1 · r + 0.2) % [1]		≤ 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	
Influence of the medium temperature (only with front-flush diaphragm)				
• Temperature difference between medium temperature and ambient temperature	3 mbar/10 K (1.2 in H_2O/10 K)			
Rated conditions				
Installation conditions				
Ambient temperature	Observe the temperature class in areas subject to explosion hazard.			
• Measuring cell with silicone oil	-40 ... +85 °C (-40 ... +185 °F)			
• Digital display	-30 ... +85 °C (-22 ... +185 °F)			
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)			
Climatic class				
Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics			
Degree of protection acc. to EN 60529	IP65, IP68, NEMA 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F)			
Electromagnetic Compatibility				
• Emitted interference and interference immunity	Acc. to EN 61326 and NAMUR NE 21			

SITRANS P300 for gauge pressure with PMC connection for the paper industry		
	HART	**PROFIBUS PA and FOUNDATION Fieldbus**
Medium conditions		
Temperature of medium		
• Measuring cell with silicone oil	-40 ... +100 °C (-40 ... +212 °F)	
Design		
Weight (without options)	Approx. 1 kg (2.2 lb)	
Enclosure material	Stainless steel, mat. no. 1.4301/304	
Material of parts in contact with the medium		
• Seal diaphragm	Hastelloy C276, mat. no. 2.4819	
• Measuring cell filling	Silicone oil	
Surface quality touched-by-media	Ra-values ≤ 0.8 µm (32 µ inch)/welds Ra ≤ 1.6 µm (64 µ inch)	
Power supply U_H		
Terminal voltage on transmitter	10.5 ... 42 V DC for intrinsically safe operation: 10.5 ... 30 V DC	Supplied through bus
Separate power supply	-	Not necessary
Bus voltage		
• Without EEx	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Max. basic current	-	12.5 mA
• Start-up current ≤ basic current	-	Yes
• Max. fault current in the event of a fault	-	15.5 mA
Fault disconnection electronics (FDE)	-	Available
Certificates and approvals		
Classification according to PED 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 05 ATEX 2048	
Marking	Ex II 1/2 G EEx ia/ib IIB/IIC T4, T5, T6	
Permissible ambient temperature		
• Temperature class T4	-40 ... +85 °C (-40 ... +185 °F)	
• Temperature class T5	-40 ... +70 °C (-40 ... +158 °F)	
• Temperature class T6	-40 ... +60 °C (-40 ... +140 °F)	
Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	To certified intrinsically-safe circuits with peak values: FISCO supply unit: U_i = 17.5 V, I_i = 380 mA, P_i = 5.32 W Linear barrier: U_i = 24 V, I_i = 250 mA, P_i = 1.2 W
Effective inner capacitance:	C_i = 6 nF	C_i = 1,1 nF
Effective internal inductance:	L_i = 0.4 mH	L_i ≤ 7 µH
Explosion protection to FM for USA and Canada (cFM_{US})		
• Identification (DIP) or (IS); (NI)	Certificate of Compliance 3025099 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	
• Identification (DIP) or (IS)	Certificate of Compliance 3025099C CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC 4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III	

1) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.08 · r + 0.16) % / 28 °C (50 °F).

SITRANS P300 with PMC connection

HART communication	
HART	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool Local operation (standard setting Address 126)
Cyclic data usage	
• Output byte	One measured value: 5 bytes Two measured values: 10 bytes
• Input byte	Register operating mode: 1 bytes Reset function due to metering. 1 bytes
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	Linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- Simulation function	Input /Output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset and preset Optional direction of counting Simulation function of the register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Monitoring of sensor limits	Yes
- Characterizer	Max. 31 points
- Characteristic curve	Linear
- Simulation function	Available
• Transducer block "Electronic temperature"	
Simulation function	Available

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

Selection and Ordering data		Order No.
SITRANS P300 pressure transmitters with PMC connection, single-chamber measuring housing, rating plate inscription in English		
with 4 ... 20 mA/HART	F)	**7MF8123-**
with PROFIBUS PA	F)	**7MF8124-**
with FOUNDATION Fieldbus (FF)	F)	**7MF8125-**
		■■■■■-■■■■
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	**1**
Inert liquid	Cleanliness level 2 to DIN 25410	**3**
Measuring span		
14.5 psi[1]	(1 bar)[1]	**B**
58 psi	(4 bar)	**C**
232 psi	(16 bar)	**D**
Wetted parts materials		
Seal diaphragm	Measuring cell	
Hastelloy[2]	Stainless steel	**B**
Process connection		
• PMC Style Standard: Thread 1½"		**2**
• PMC Style Minibolt: front-flush 1" (minimum span: 500 mbar (200 inH_2O), not available with 1-bar-measuring cell (Option B))		**3**
Non-wetted parts materials		
• Stainless steel, deep-drawn and electrolytically polished		**4**
Version		
• Standard versions		**1**
Explosion protection		
• None		**A**
• With ATEX, Type of protection:		
- "Intrinsic safety (EEx ia)"		**B**
• With FM + CSA, Type of protection:		
- "Intrinsic Safe (is)" (planned)		**M J**
Electrical connection / cable entry		
• Screwed gland M20 x .5 (polyamide)[3]		**A**
• Screwed gland M20 x 1.5 (metal)		**B**
• Screwed gland M20 x 1.5 (stainless steel)		**C**
• M20 connectors (stainless steel), without cable socket)		**G**
• ½-14 NPT stainless steel thread[4]		**J**

Selection and Ordering data		Order No.
SITRANS P300 pressure transmitters with PMC connection, single-chamber measuring housing, rating plate inscription in English		
with 4 ... 20 mA/HART	F)	**7MF8123-**
with PROFIBUS PA	F)	**7MF8124-**
with FOUNDATION Fieldbus (FF)	F)	**7MF8125-**
		■■■■■-■■■■
Indicator		
• Without display, with keys, closed lid		**1**
• With display and keys, closed lid		**2**
• With display and keys, lid with plastics (Makrolon) pane (setting on HART devices: mA, on Profibus devices: pressure units)		**4**
• With display and keys, lid with plastics (Makrolon) pane (setting acc. to specifications, Order code "Y21" or "Y22" required)		**5**
• With indicator (digital display visible, setting: mA)		**6**
• With indicator (digital display visible, setting as specified) Order code "Y21" or "Y22" required		**7**

Power supply units see Chap. 8 "Supplementary Components".

Included in delivery of the device:
- Brief instructions (Leporello)
- CD-ROM with detailed documentation
- sealing ring

1) Only with "Standard" process connection

2) Only possible for flange with M.., N.. and Q.. option

3) Only together with HART electronics.

4) Without cable gland.

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

Transmitters for gauge pressure for the paper industry

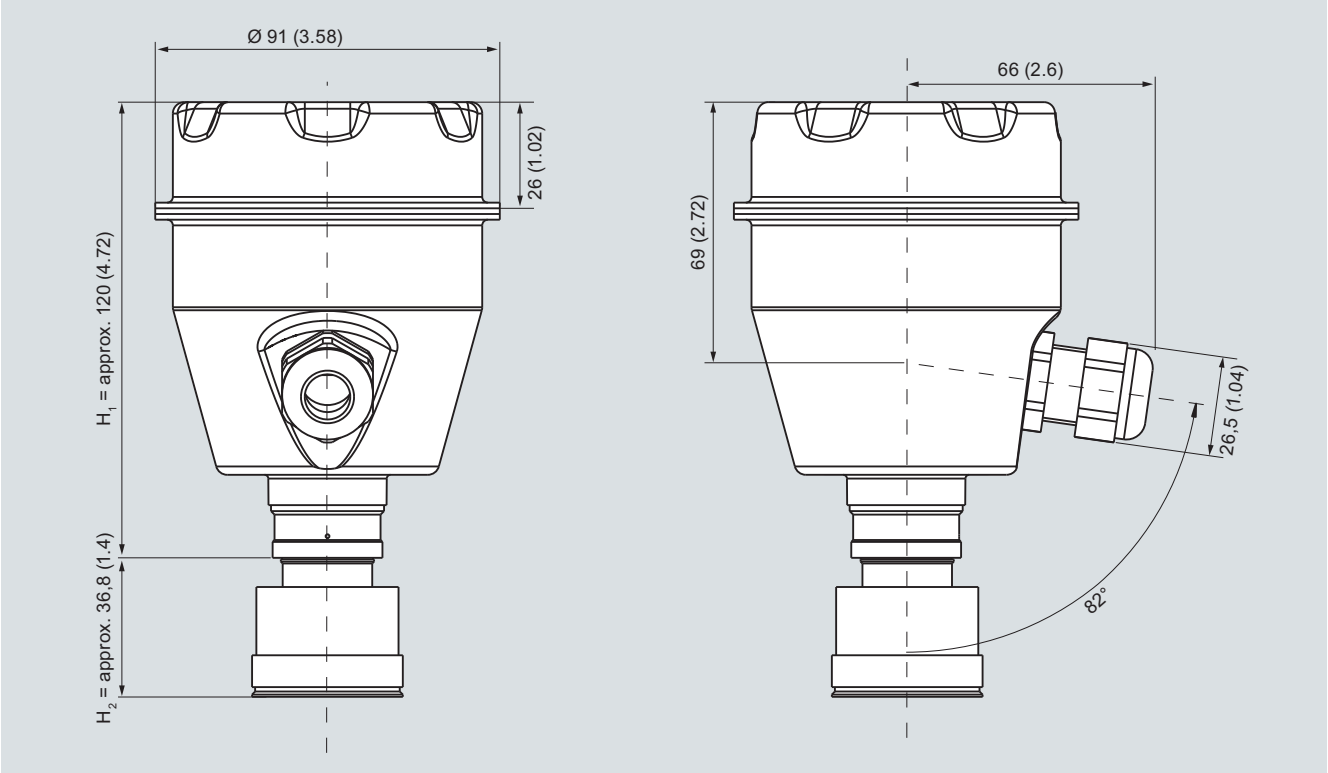
SITRANS P300 with PMC connection

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
Rating plate inscription (instead of English)				
• German	**B10**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
English rating plate Pressure units in inH_20 and/or psi	**B21**	✓	✓	✓
Factory calibration certificate	**C11**	✓	✓	✓
Material traceability certificate	**C12**	✓	✓	✓
Factory certificate of conformance	**C14**	✓	✓	✓
Set output signal to upper limit of 22.0mA	**D05**	✓	✓	✓
Degree of protection IP68 (only for M20x1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Brad Harrison Connector	**D40**	✓	✓	✓
Mounting				
• Weldable sockets for standard 1½" threaded connection	**P01**	✓	✓	✓
• Weldable socket for minibolt connection 1" (incl. screw 5/16-18 UNC-2B and washer)	**P02**	✓	✓	✓
Additional data				
Please add "**-Z**" to Order No. and specify Order code(s) and plain text.				
Calibrated range Specify in plain text (max. 5 characters): Y01: X to Y psi, inH_20, ftH_20...	**Y01**	✓		
Tag number/Identification (max. 16 characters), specify in plain text: Y15:	**Y15**	✓	✓	✓
Tag description (max. 27 characters), specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART (TAG) (max. 8 characters), specify in plain text: Y17:	**Y17**	✓		
Pressure units for digital display specify in plain text: Y21: psi, inH_20, ftH_20 ...	**Y21**	✓	✓	✓
Non-Pressure units for digital display (measuring range in pressure units ("Y01"/"Y02") mandatory) specify in plain text: Y22: X to Y GPM, MGD, Feet ...	**Y22 + Y01**	✓		
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	**Y25**		✓	

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

✓ = available

Dimensional drawings



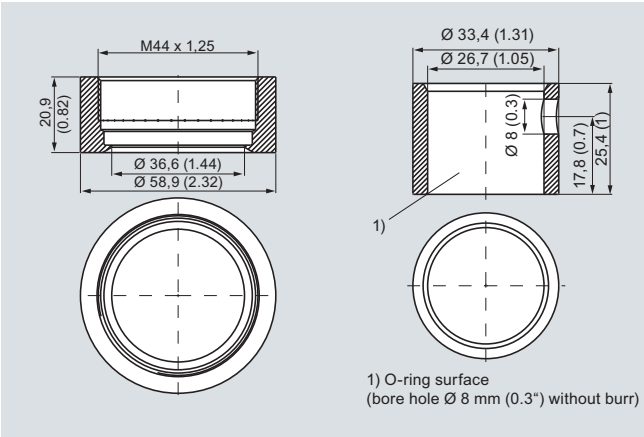
SITRANS P300 pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

The diagram shows a SITRANS P300 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 P300 up to a defined cross-section

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

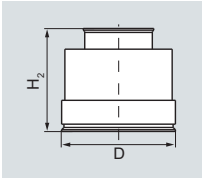
Only the height H_2 is indicated in the dimensions of the flanges.



PMC Style Standard (left) and PMC Style Minibolt (right) weldable sockets, dimensions in mm (inch)

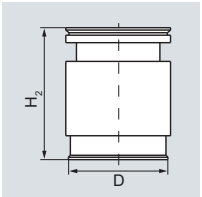
Material: Stainless steel, mat. No. 1.4404 / 316L

PMC Style Standard



DN	PN	∅D	H_2
		40.4 mm (1.6“)	Approx. 36.8 mm (1.4“)

PMC Style Mini bolt



DN	PN	∅D	H_2
		26.3 mm (1.0“)	Approx. 33.1 mm (1.3“)

SITRANS P DS III
Technical description

Overview

SITRANS P DS III pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameterization is performed using control keys or via HART, 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:

- Gauge pressure
- Absolute pressure
- Differential pressure
- Level
- Volume level
- Mass level
- volume flow
- Mass flow

Benefits

- High quality and service 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
- Good long-term stability
- Wetted parts made of high-grade materials (e.g. stainless steel, Hastelloy, gold, Monel, tantalum)
- Infinitely adjustable span from 0.15 psi to 10153 psi (0.01 bar to 700 bar) for DS III with HART interface
- Nominal measuring range from 14.5 psi to 10153 psi (1 bar to 700 bar) for DS III with PROFIBUS PA and FOUNDATION Fieldbus
- High measuring accuracy
- Parameterization over control keys and HART or PROFIBUS PA, 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 buttons or programmed externally via HART or PROFIBUS PA or FOUNDATION Fieldbus interface.

Pressure transmitter for gauge pressure

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

Span (infinitely adjustable)
for DS III with HART: 0.15 psi ... 10153 psi (0.01 bar ... 700 bar)

Nominal measuring range
for DS III with PROFIBUS PA and FOUNDATION Fieldbus:
14.5 psi ... 10153 psi (1 bar ... 700 bar)

Pressure transmitters for absolute pressure

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

Span (infinitely adjustable)
for DS III with HART: 0.12 ... 1450 psia (8.3 mbar a ... 100 bar a)

Nominal measuring range
for DS III with PROFIBUS PA and FOUNDATION Fieldbus:
3.63...1450 psia (250 mbar a...100 bar a)

There are two series:

- Gauge pressure series
- Differential pressure series

Pressure transmitters for differential pressure and flow

Measured variables:

- Differential pressure
- Small positive or negative pressure
- Flow q ~ √Δp (together with a primary differential pressure device (see Chapter "Flow Meters"))

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

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

Pressure transmitters for level

Measured variable: Level of aggressive and non-aggressive liquids in open and closed vessels.

Span (infinitely adjustable)
for DS III with HART: 0.363 ... 72.5 psi (25 mbar ... 5 bar)

Nominal measuring range
for DS III with PROFIBUS PA and FOUNDATION Fieldbus:
3.63 ... 72.5 psi (250 mbar ... 5 bar)

Nominal diameter of the mounting flange

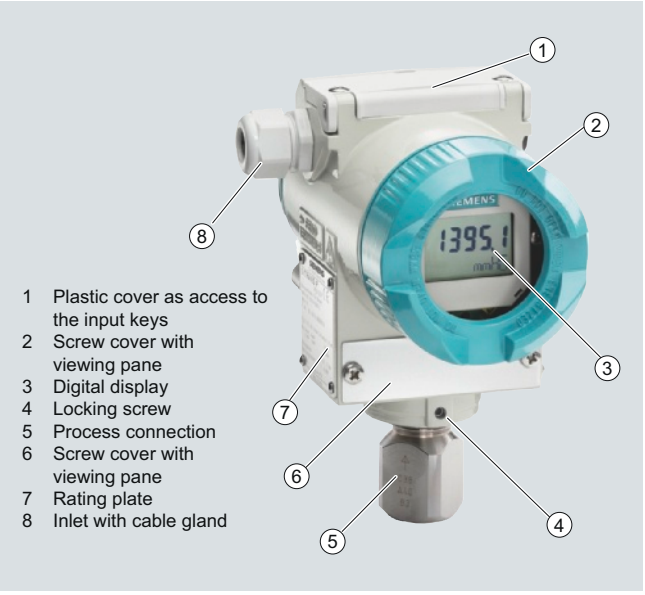
- DN 80 or DN 100
- 3 inch or 4 inch

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



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

Front view

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

The rating plate (7, Figure "Front view") with the 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).

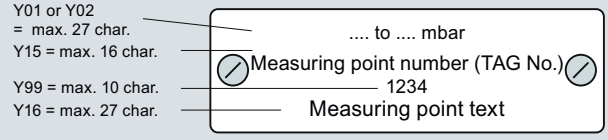
The approval label is located on the opposite side.

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

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the housing contains the measuring cell with process connection (5). The measuring cell is prevented from rotating by a locking screw (4). As the result of this modular design, the measuring cell and the electronics can be replaced separately from each other. The set parameter data are retained.

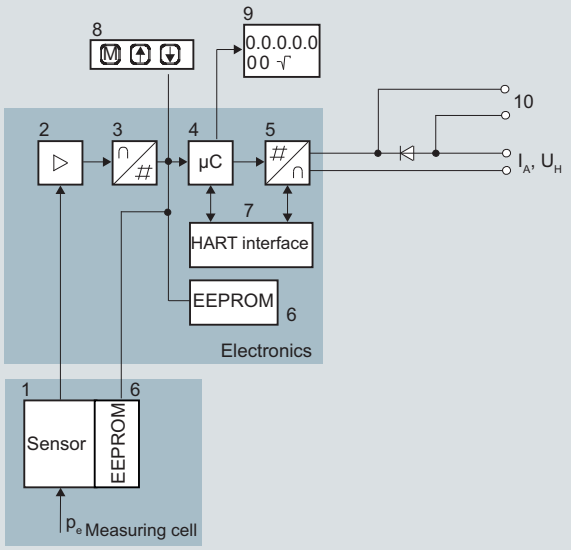
At the top of the housing is a plastic cover (1), which hides the input keys.

Example for an attached measuring point label



Function

Operation of electronics with HART communication



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

Function diagram of electronics

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

The diode circuit (10) protects against incorrect polarity.

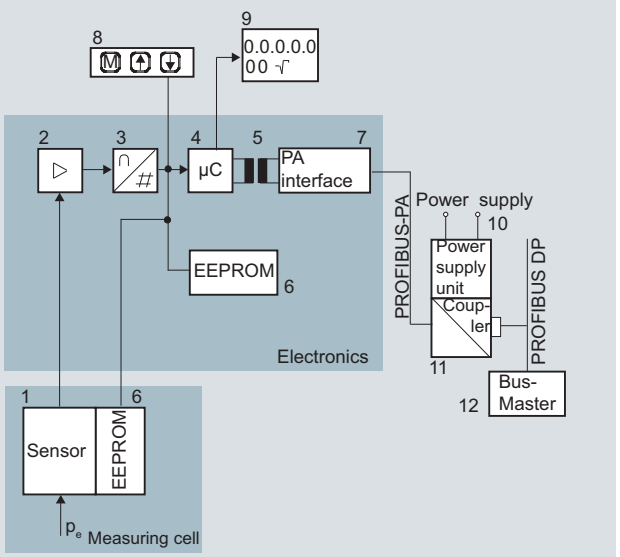
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

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



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

Function diagram of electronics

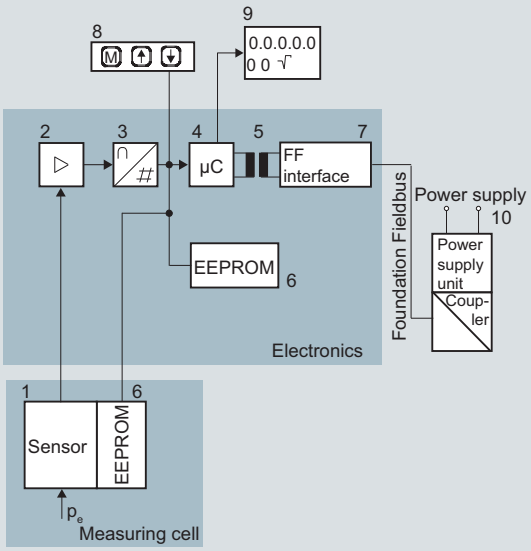
The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected,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

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

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

Operation of electronics with FOUNDATION Fieldbus communication



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

Function diagram of electronics

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

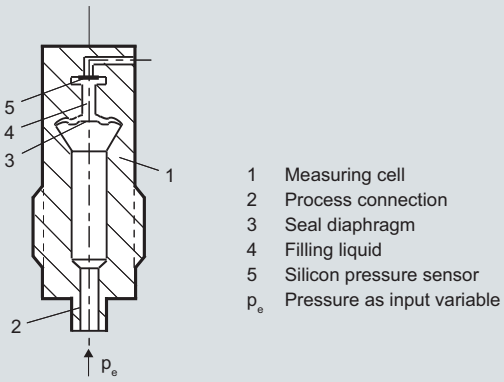
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As a result of this modular design, the electronics and the measuring cell can be replaced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

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

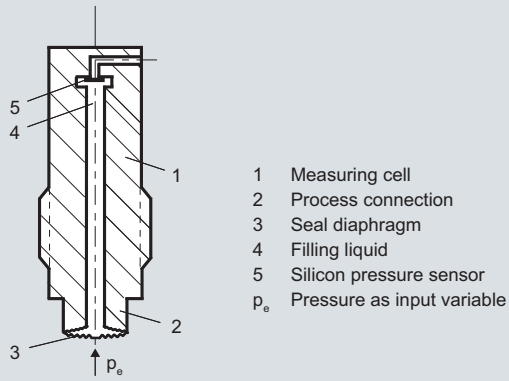


1	Measuring cell
2	Process connection
3	Seal diaphragm
4	Filling liquid
5	Silicon pressure sensor
p_e	Pressure as input variable

Measuring cell for gauge pressure, function diagram

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

Measuring cell for gauge pressure with front-flush diaphragm

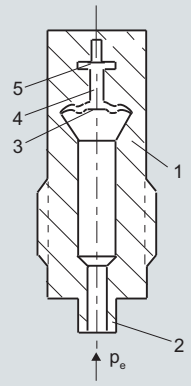


1	Measuring cell
2	Process connection
3	Seal diaphragm
4	Filling liquid
5	Silicon pressure sensor
p_e	Pressure as input variable

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

The pressure $_p$e is applied through the process connection (2, Figure "Measuring cell for gauge 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 absolute pressure.

Measuring cell for absolute pressure from gauge pressure series

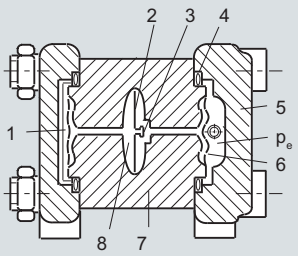


1 Measuring cell
2 Process connection
3 Seal diaphragm
4 Filling liquid
5 Silicon absolute pressure sensor
p_e Absolute pressure as input variable

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 pressure series, gauge pressure, 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 absolute pressure.

Measuring cell for absolute pressure from differential pressure series



1 Reference vacuum
2 Overload diaphragm
3 Silicon pressure sensor
4 O-ring
5 Process flange
6 Seal diaphragm
7 Body of measuring cell
8 Filling liquid
p_e Absolute pressure as input variable

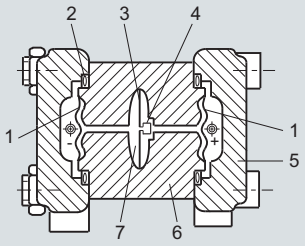
Measuring cell for absolute pressure from differential pressure series, function diagram

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. 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 differential pressure and flow



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

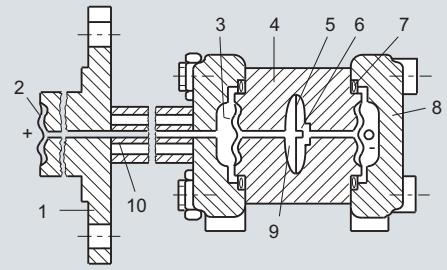
Measuring cell for differential pressure and flow, function diagram

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

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



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

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

Parameterization DS III

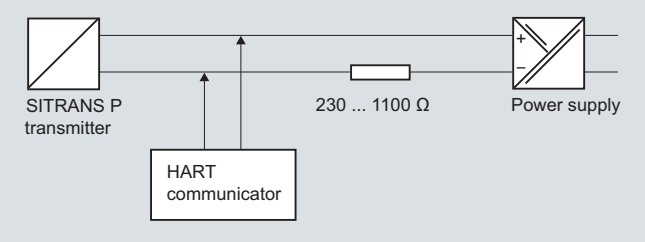
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the pushbuttons (local operation)

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

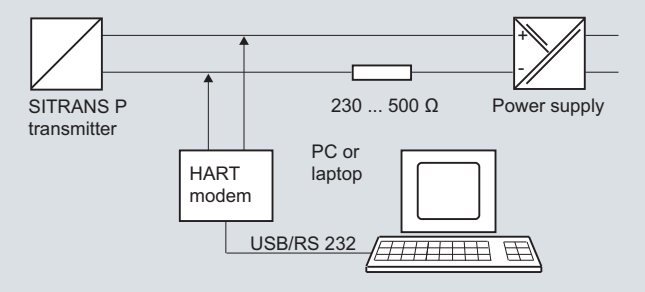
Parameterization using HART

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



Communication between a HART communicator and a pressure transmitter

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



HART communication between a PC communicator and a pressure transmitter

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

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

Adjustable parameters, DS III with HART

Parameters	Pushbuttons (DS III HART)	HART communication
Start of scale	x	x
Full-scale value	x	x
Electrical damping	x	x
Start-of-scale value without application of a pressure ("Blind setting")	x	x
Full-scale value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x[1)]
Type of dimension and actual dimension	x	x
Linear or square root output	x[2)]	x[2)]
Characterizer setup		x
Freely-programmable LCD		x
Diagnostic functions		x

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

Diagnostic functions for DS III with HART

- Zero correction for position
- Event counter
- Transmitter alarms
- Saturation alarm
- Min/Max registers
- Simulation functions
- Maintenance timer

Available physical units of display for DS III with 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 is 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 with PROFIBUS PA and FOUNDATION Fieldbus

Parameters	Push-buttons	PROFIBUS PA and FOUNDATION Fieldbus interface
Electrical damping	x	x
Zero adjustment (correction of position)	x	x
Buttons and/or function disabling	x	x
Source of measured-value display	x	x
Physical dimension of display	x	x
Position of decimal point	x	x
Bus address	x	x
Linear or square root output	x	x
Characterizer setup		x
Freely-programmable LCD		x
Diagnostics functions		x

Diagnostic functions for DS III with PROFIBUS PA and FOUNDATION Fieldbus

- Event counter
- Min/Max registers
- Maintenance timer
- Simulation functions
- Zero correction for position
- Transmitter alarms
- Saturation alarm

Physical dimensions available for the display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	MPa, kPa, Pa, bar, mbar, torr, atm, psi, g/cm^2, kg/cm^2, mmH_2O, mmH_2O (4 °C), inH_2O, inH_20 (4 °C), ftH_2O (20 °C), mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Volume	m^3, dm^3, hl, yd^3, ft^3, in^3, US gallon, Imp. gallon, bushel, barrel, barrel liquid
volume flow	m^3/s, m^3/min, m^3/h, m^3/d, l/s, l/min, l/h, l/d, Ml/d, ft^3/s, ft^3/min, ft^3/h, ft^3/d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d
Mass flow	g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, /t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d
Total mass flow	t, kg, g, lb, oz, LTon, STon
Temperature	K, °C, °F, °R
Miscellaneous	%

Technical specifications

SITRANS P, DS III series for gauge pressure				
	HART		**PROFIBUS PA and FOUNDATION Fieldbus**	
Input				
Measured variable	Gauge pressure			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span (min. ... max.)	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.15 ... 14.5 psi (0.01 ... 1 bar)	87 psi (6 bar)	14.5 psi (1 bar g)	87 psi (6 bar)
	0.58 ... 58 psi (0.04 ... 4 bar)	145 psi (10 bar)	58 psi (4 bar)	145 psi (10 bar)
	2.23 ... 232 psi (0.16 ... 16 bar)	464 psi (32 bar)	232 psi (16 bar)	464 psi (32 bar)
	9.14 ... 914 psi (0.6 ... 63 bar)	1450 psi (100 bar)	914 psi (63 bar)	1450 psi (100 bar)
	23.2 ... 2320 psi (1.6 ... 160 bar)	3626 psi (250 bar)	2320 psi (160 bar)	3626 psi (250 bar)
	58 ... 5802 psi (4.0 ... 400 bar)	8700 psi (600 bar)	5802 psi (400 bar)	8700 psi (600 bar)
	102 ... 10153 psi (7.0 ... 700 bar)	11603 psi (800 bar)	10153 psi (700 bar)	11603 psi (800 bar)
Lower measuring limit				
• Measuring cell with silicone oil filling	0.44 psi a (30 mbar a)			
• Measuring cell with inert filling liquid	0.44 psi a (30 mbar a)			
Upper measuring limit	100 % of max. span (for oxygen version and inert filling liquid; max. 120 bar(1740 psi))			
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA and FOUNDATION Fieldbus signal	
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-	
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
Load				
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V		-	
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.			
Measuring accuracy	Acc. to IEC 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 at limit setting incl. hysteresis and reproducibility				
• 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) %			
Long-term stability (temperature change ± 30 °C (± 54 °F))				
• 1- to 4-bar measuring cell	≤ (0.25 · r) % per 5 years		≤ 0.25 ·) % per 5 years	
• 16- to 400-bar measuring cell	≤ (0.125 · r) % per 5 years		≤ 0.125 ·) % per 5 years	
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)	≤ (0.08 · r + 0.1)% [1] (at 700 bar: ≤ (0.1 · r + 0.2)% [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 DS III for gauge pressure

SITRANS P, DS III series for gauge pressure	HART	PROFIBUS PA and FOUNDATION Fieldbus
Rated conditions		
Degree of protection (to IEC 60529)	IP65 (optional IP68)	
Temperature of medium		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)	
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
• Ambient temperature		
- Digital indicator	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
• Electromagnetic Compatibility		
- Emitted interference and interference immunity	Acc. to EN 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
• Connection shank	Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4610	
• 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 (maximum value with oxigen measurement pressure 120 bar (1740 psi) at 60 °C (140 °F))	
Process connection	Connection shank G½B to DIN EN 837-1, female thread ½ -14 NPT or oval flange (PN 160 (MAWP 2320 psi)) to DIN 19213 with mounting thread M10 or $^{7}/_{16}$-20 UNF to IEC 61518	
Material of mounting bracket		
Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated	
Stainless steel	Sheet stainless steel, mat. no. 1.4301 (SS 304)	
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
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P, DS III series for gauge pressure	HART	PROFIBUS PA and FOUNDATION Fieldbus
Certificates and approvals		
Classification according to PED 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	
- Marking	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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G 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	
- Marking	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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Marking	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
- Marking	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection acc. 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	

1) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.064 · r + 0.08) % / 28 °C (50 °F).

2) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.08 · r + 0.16) % / 28 °C (50 °F).

SITRANS P DS III for gauge pressure

HART communication	
HART	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Characterizer	Max. 30 points
- Square-rooted characteristic for flow measurement	Yes
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

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

Selection and Ordering data		Order No.
Pressure transmitter for gauge pressure, SITRANS P DS III with HART		**7MF4033 -**
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Inert liquid[1]	Grease-free to cleanliness level 2	3
Measuring span (min. ... max.)		
0.15 ... 14.5 psi	(0.01 ... 1 bar)	B
0.58 ... 58 psi	(0.04 ... 4 bar)	C
2.32 ... 232 psi	(0.16 ... 16 bar)	D
9.14 ... 914 psi	(0.63 ... 63 bar)	E
23.2 ... 2320 psi	(1.6 ... 160 bar)	F
58.0 ... 5802 psi	(4.0 ... 400 bar)	G
102.0 ...10153 psi	(7.0 ... 700 bar)	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 1
Process connection		
• Connection shank G½B to EN 837-1		0
• Female thread ½-14 NPT		1
• Stainless steel oval flange		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518		2
- Mounting thread M10 to DIN 19213		3
- Mounting thread M12 to DIN 19213		4
• Male thread M20 x 1.5		5
• Male thread ½ -14 NPT		6
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting[4)]		3
Version		
• Standard versions		1
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)		2
Hazardous area rating		
• General purpose		A
• ATEX Hazardous approval		
- "Intrinsically safe (EEx ia)"		B
- "Explosion-proof (EExd)"[5)]		D
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[6)]		P
- use in zone 2		E
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[6)]		R
• FM/CSA Hazardous approval		
- "Intrinsically Safe und explosion proof (is + xp)"[5)]		N C
Electrical connection / cable entry		
• Screwed gland Pg 13.5 (adapter)[7)]		A
• Screwed gland M20 x1 .5		B
• ½-14 NPT		C
• Han 7D plug (plastic housing) incl. mating connector[7)]		D
• M12 connectors (metal)[8)]		F

Selection and Ordering data	Order No.
Pressure transmitter for gauge pressure, SITRANS P DS III with HART	**7MF4033 -**
Indicator	
• Without indicator	0
• Without indicator (digital display hidden, setting: mA)	1
• With indicator (digital display visible, setting: mA)	6
• With indicator (digital display visible, setting as specified, Order code "Y21"/"Y22" required)	7

Power supply units see Chap. 8 "Supplementary Components".

Included in delivery of the device:
- Brief instructions (Leporello)
- CD-ROM with detailed documentation

1) For oxygen cleaning application, add Order code E10.

2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

3) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

4) Not in conjunction 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 in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof".

8) M12 delivered without cable socket

SITRANS P DS III for gauge pressure

2

Selection and Ordering data		Order No.
Pressure transmitter for gauge pressure		
SITRANS P DS III with PROFIBUS PA (PA)		**7MF4034-**
SITRANS P DS III with FOUNDATION Fieldbus (FF)		**7MF4035-**
		■■■■■-■■■■
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Inert liquid[1]	Grease-free to cleanliness level 2	3
Nominal measuring range		
14.5 psi	(1 bar)	B
58 psi	(4 bar)	C
232 psi	(16 bar)	D
914 psi	(63 bar)	E
2320 psi	(160 bar)	F
5802 psi	(400 bar)	G
10153 psi	(700 bar)	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 1
Process connection		
• Connection shank G½B to EN 837-1		0
• Female thread ½-14 NPT		1
• Stainless steel oval flange		
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518		2
- Mounting thread M10 to DIN 19213		3
- Mounting thread M12 to DIN 19213		4
• Male thread M20 x 1.5		5
• Male thread ½ -14 NPT		6
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting		3
Version		
• Standard versions		1
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)		2
Hazardous area rating		
• General purpose		A
• ATEX Hazardous approval		
- "Intrinsically safe (EEx ia)"		B
- "Explosion-proof (EExd)"[4)]		D
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[5)]		P
- use in zone 2		E
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[5)]		R
• FM/CSA Hazardous approval		
- "Intrinsically Safe und explosion proof (is + xp)"[4)]		N C
Electrical connection / cable entry		
• Screwed gland M20 x 1.5		B
• Screwed gland ½-14 NPT		C
• M12 connectors (metal)[6)]		F

Selection and Ordering data	Order No.
Pressure transmitter for gauge pressure	
SITRANS P DS III with PROFIBUS PA (PA)	**7MF4034-**
SITRANS P DS III with FOUNDATION Fieldbus (FF)	**7MF4035-**
	■■■■■-■■■■
Indicator	
• Without indicator	0
• Without indicator(digital display hidden)	1
• With indicator (digital display visible)	6
• With indicator (digital display visible, setting as specified, Order code "Y21" required)	7

Included in delivery of the device: Brief instructions (Leporello) CD-ROM with detailed documentation

1) For oxygen cleaning application, add Order code E10.

2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

3) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

4) Without cable gland, with blanking plug

5) With enclosed cable gland EEx ia and blanking plug

6) M12 delivered without cable socket

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Order No. and specify Order Code.				
Pressure transmitter with mounting bracket (2 shackles, 4 nuts, 4 U-plates, 1 angle) made of:				
• Steel	**A01**	✓	✓	✓
• Stainless steel	**A02**	✓	✓	✓
plug				
• Han 7D (metal, gray)	**A30**	✓		
• Han 8U (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
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 in$H_2$0 and/or psi	**B21**	✓	✓	✓
Factory calibration certificate[1]	**C11**	✓	✓	✓
Material traceability certificate[2]	**C12**	✓	✓	✓
Factory certificate of conformance	**C14**	✓	✓	✓
SIL2 certificate per IEC 61508 / 61511	**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**	✓	✓	✓
Degree of protection IP68 (only for M20x1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Brad Harrison Connector	**D40**	✓	✓	✓
External, ½" NPT	**J01**	✓		
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	**E01**	✓	✓	✓
Oxygen application (In the case of oxygen measurement and inert liquid max. 120 bar G (1740 psi G) at 60°C (140 °F))	**E10**	✓	✓	✓
Manifold Mounting assembled to Block & bleed valve (7MF9011-4FA)				
Assembled to Block & bleed valve (7MF9011-4FA) ½-14 NPT male, PTFE packing and pressure test	**T03**			
Two coats of lacquer on casing and cover (PU on epoxy)	**G10**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Additional data Please add "**-Z**" to Order No. and specify Order code(s) and plain text.				
Calibrated range Specify in plain text (max. 5 characters): Y01: X to Y psi, in$H_2$0, ft$H_2$0...	**Y01**	✓		
Tag number/Identification (max. 16 characters), specify in plain text: Y15:	**Y15**	✓	✓	✓
Tag description (max. 27 characters), specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART (TAG) (max. 8 characters), specify in plain text: Y17:	**Y17**	✓		
Pressure units for digital display specify in plain text: Y21: psi, in$H_2$0, ft$H_2$0 ...	**Y21**	✓	✓	✓
Non-Pressure units for digital display[3] (measuring range in pressure units ("Y01"/"Y02") mandatory) specify in plain text: Y22: X to Y GPM, MGD, Feet ...	**Y22 + Y01**	✓		
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	**Y25**		✓	

Factory mounting of valve manifolds, see accessories.

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

✓ = available

Ordering example

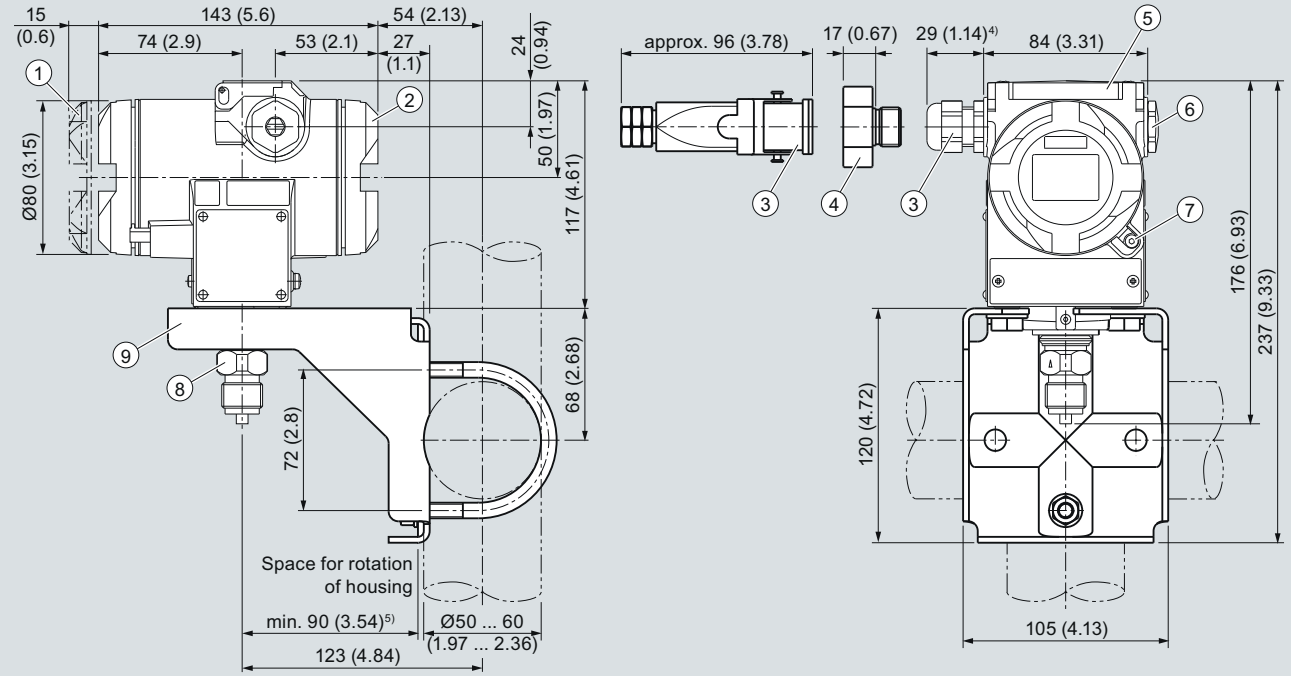
Item line:	7MF4033-1EA00-1AA7-Z
B line:	A01 + Y01 + Y21
C line:	Y01: 145 ... 290 psi (10 ... 20 bar)
C line:	Y21: psi (bar)

1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

2) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

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

Dimensional drawings



1. Electronic side, digital display (longer overall length for cover with window)[1]
2. Terminal side[1]
3. Electrical connection: Screwed gland Pg 13,5 (adapter)(Adapter)[2][3], Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/Han 8D[2][3] plug
4. Harting adapter
5. Protective cover over keys
6. Blanking plug
7. Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
8. Process connection: Connection shank G½A or Oval flange
9. Mounting bracket (option)

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 DS IIIpressure transmitters for gauge pressure, dimensions in mm (inch)

Technical specifications

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

	HART		PROFIBUS PA and FOUNDATION Fieldbus	
Input of gauge pressure, with front-flush diaphragm				
Measured variable	Gauge pressure, front-flush			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span (min. ... max.)	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.15 ... 14.5 psi (0.01 ... 1 bar)	87 psi (6 bar)	14.5 psi (1 bar)	87 psi (6 bar)
	0.58 ... 58 psi (0.04 ... 4 bar)	145 psi (10 bar)	58 psi (4 bar)	145 psi (10 bar)
	2.23 ... 232 psi (0.16 ... 16 bar)	464 psi (32 bar)	232 psi (16 bar)	464 psi (32 bar)
	9.14 ... 914 psi (0.6 ... 63 bar)	1450 psi (100 bar)	914 psi (63 bar)	1450 psi (100 bar)
Lower measuring limit	1.45 psi a (100 mbar a)			
Upper measuring limit	100 % of max. span		100 % of the max. nominal measuring range	
Input of absolute pressure, with front-flush diaphragm				
Measured variable	Absolute pressure, front-flush			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span (min. ... max.)	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.62 ... 18.9 psia (43 ... 1300 mbar a)	145 psia (10 bar a)	18.9 psia (1300 mbar a)	145 psia (10 bar a)
	2.32 ... 72.5 psia (0.16 ... 5 bar a)	435 psia (30 bar a)	72.5 psia (5 bar a)	435 psia (30 bar a)
	14.5 ... 435 psia (1 ... 30 bar a)	1450 psia (100 bar a)	435 psia (30 bar a)	1450 psia (100 bar a)
Lower measuring limit	0 psi a (0 bar a)			
Upper measuring limit	100 % of max. span		100 % of the max. nominal measuring range	
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA and FOUNDATION Fieldbus signal	
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-	
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
Load				
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V		-	
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.			
Measuring accuracy	Acc. to IEC 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 at limit setting incl. hysteresis and reproducibility				
	Gauge pressure, front-flush	Absolute pressure, front-flush	Gauge pressure, front-flush	Absolute pressure, front-flush
• Linear characteristic			≤ 0.075 %	≤ 0.2 %
- r ≤ 10	≤ (0.0029 · r + 0.071) %	≤ 0.2 %		
- 10 < r ≤ 30	≤ (0.0045 · r + 0.071) %	≤ 0.4 %		
- 30 < r ≤ 100	≤ (0.005 · r + 0.05) %			
Long-term stability (temperature change ± 30 °C (± 54 °F))	≤ (0.25 · r) % per 5 years		≤ 0.25 % per 5 years	

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm				
	HART		PROFIBUS PA and FOUNDATION Fieldbus	
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)	≤ (0.1 · r + 0.2) %[1)]	≤ (0.2 · r + 0.3) %	≤ 0.3 %	≤ 0.5 %
• at -40 ... -10 °C and 60 ... 85 °C (-40 ... +14 °F and 140 ... 185 °F)	≤ (0.1 · r + 0.15) %/10 K	≤ (0.2 · r + 0.3) %/10 K	≤ 0.25 %/10 K	≤ 0.5 %/10 K
Influence of mounting position	0.1 mbar g (0.00145 psi g) per 10° inclination			
Measured Value Resolution	-		3 · 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 conditions				
Installation conditions				
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) (in the case of Neobee: -20 ... +85 °C (-4 ... +185/°F))			
• Climatic class				
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics			
Degree of protection (to IEC 60529)	IP65, IP68, NEMA 4X, enclosure cleaning, resistant to lyes, steam to 150 ° C (302 °F)			
• Electromagnetic Compatibility				
- Emitted interference and interference immunity	Acc. to EN 61326 and NAMUR NE 21			
Medium conditions				
Temperature of medium				
• 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)	-10 ... +150 °C (14 ... 302 °F)			
• Measuring cell with silicone oil, with temperature decoupler (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)			
Enclosure material	Low-copper die-cast aluminum, GD-AlSi12 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			
Process connection	•Flanges as per EN and ASME •F&B and pharmaceutical flanges			
Surface quality touched-by-media	R_a-values ≤ 0.8 µm (32 µ-inch)/welds $R_{a)}$ ≤ 1.6 µm (64 µ-inch) (Process connections according to 3A; R_a-values ≤ 0,8 µm (32 µ-inch)/welds R_a) ≤ 0,8 µm (32 µ-inch)			

SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm		
	HART	**PROFIBUS PA and 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
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes
Certificates and approvals		
Classification according to PED 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	
- Marking	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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G 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	
- Marking	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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Marking	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
- Marking	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection acc. 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	

[1] Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.064 · r + 0.08) % / 28 °C (50 °F).

Sanitary version

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

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

HART communication	
HART	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Characterizer	Max. 30 points
- Square-rooted characteristic for flow measurement	Yes
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

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

Selection and Ordering data			Order No.										
Pressure transmitter for gauge and absolute pressure, front-flush diaphragm, SITRANS P DS III with HART		F)	**7**	**M**	**F**	**4**	**1**	**3**	**3**	**-**			
Measuring cell filling	**Measuring cell cleaning**												
Silicone oil	normal		**1**										
Inert liquid	Grease-free to cleanliness level 2		**3**										
FDA compliant fill fluid													
• Neobee oil	normal		**4**										
Measuring span (min. ... max.)													
0.15 ... 14.5 psi	(0.01 ... 1 bar)			**B**									
0.58 ... 58 psi	(0.04 ... 4 bar)			**C**									
2.32 ... 232 psi	(0.16 ... 16 bar)			**D**									
9.14 ... 914 psi	(0.63 ... 63 bar)			**E**									
0.19 ... 18.9 psia[1]	(13 ... 1300 mbar a)[1]			**S**									
0.7 ... 72.5 psia[1]	(0.05 ... 5 bar a)[1]			**T**									
43.5 ... 435 psia[1]	(3 ... 30 bar a)[1]			**U**									
Wetted parts materials													
Seal diaphragm	Connection shank												
Stainless steel	Stainless steel				**A**								
Hastelloy[2]	Stainless steel				**B**								
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 versions								**1**					
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)								**2**					
Hazardous area rating													
• General purpose									**A**				
• ATEX Hazardous approval													
- "Intrinsically safe (EEx ia)"									**B**				
- "Explosion-proof (EExd)"[3]									**D**				
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[4]									**P**				
- use in zone 2									**E**				
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[4]									**R**				
• FM/CSA Hazardous approval									**N**	**C**			
- "Instrinsically safe and explosion proof (is + xp)"[3]													
Electrical connection / cable entry													
• Inner thread M20 x 1.5										**B**			
• Female thread ½-14 NPT										**C**			
• M12 connectors (metal)[5]										**F**			
Indicator													
• Without indicator											**0**		
• Without indicator (digital display hidden, setting: mA)											**1**		
• With indicator (digital display visible, setting: mA)											**6**		
• With indicator (digital display visible, setting as specified, Order code "Y21"/"Y22" required)											**7**		

Power supply units see Chap. 8 "Supplementary Components".

Included in delivery of the device:
- Brief instructions (Leporello)
- CD-ROM with detailed documentation

1) 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.
2) Only possible for flange with M.., N.. and Q.. option.
3) Without cable gland, with blanking plug
4) With enclosed cable gland EEx ia and blanking plug
5) M12 delivered without cable socket
F) Subject to export regulations AL: 9I999, ECCN: N.

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

Selection and Ordering data		Order No.
Pressure transmitter P for gauge and absolute pressure, front-flush diaphragm:		
SITRANS P DS III with PROFIBUS PA (PA)	F)	**7MF4134-**
SITRANS P DS III with FOUNDATION Fieldbus (FF)	F)	**7MF4135-**

Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	**1**
Inert liquid	Grease-free to cleanliness level 2	**3**
FDA compliant fill fluid		
• Neobee oil	normal	**4**
• Medical whiteoil		**6**
Nominal measuring range		
14.5 psi	(1 bar)	**B**
58 psi	(4 bar)	**C**
232 psi	(16 bar)	**D**
914 psi	(63 bar)	**E**
18.9 psia[1)]	(1300 mbar a)[1)]	**S**
72.5 psia[1)]	(5 bar a)[1)]	**T**
435 psia[1)]	(30 bar a)[1)]	**U**
Wetted parts materials		
Seal diaphragm	Connection shank	
Stainless steel	Stainless steel	**A**
Hastelloy[2)]	Stainless steel	**B**
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 versions		**1**
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)		**2**
Hazardous area rating		
• General purpose		**A**
• ATEX Hazardous approval		
- "Intrinsically safe (EEx ia)"		**B**
- "Explosion-proof (EExd)"[3)]		**D**
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[4)]		**P**
- use in zone 2		**E**
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[4)]		**R**
• FM/CSA Hazardous approval		
- "Intrinsically Safe und explosion proof (is + xp)"[3)]		**N C**
Electrical connection / cable entry		
• Screwed gland M20 x 1.5		**B**
• ½-14 NPT		**C**
• M12 connectors (metal)[5)]		**F**

Selection and Ordering data		Order No.
Pressure transmitter P for gauge and absolute pressure, front-flush diaphragm:		
SITRANS P DS III with PROFIBUS PA (PA)	F)	**7MF4134-**
SITRANS P DS III with FOUNDATION Fieldbus (FF)	F)	**7MF4135-**

Indicator	
• Without indicator	**0**
• Without indicator (digital display hidden, setting: mA)	**1**
• With indicator (digital display visible, setting: mA)	**6**
• With indicator (digital display visible, settings as specified, Order Code "Y21" required)	**7**

Included in delivery of the device:
- Brief instructions (Leporello)
- CD-ROM with detailed documentation

1) Not with temperature decoupler P00 and P10, not for process connections R01, R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.

2) Only possible for flange with M.., N.. and Q.. option.

3) Without cable gland, with blanking plug

4) With enclosed cable gland EEx ia and blanking plug

5) M12 delivered without cable socket

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

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Order No. and specify Order Code.				
Plug				
• Angled	**A32**	✓		
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 in$H_2$0 and/or psi	**B21**	✓	✓	✓
Factory calibration certificate	**C11**	✓	✓	✓
Material traceability certificate	**C12**	✓	✓	✓
Factory certificate of conformance	**C14**	✓	✓	✓
PROFIsafe certificate and protocol	**C21**		✓	
Two coats of lacquer on casing and cover (PU on epoxy)	**G10**	✓	✓	✓
Flanges to EN 1092-1, Form b1				
• DN 25, PN 40[1)]	**M11**	✓	✓	✓
• DN 25, PN 100[1)]	**M21**	✓	✓	✓
• DN 40, PN 40	**M13**	✓	✓	✓
• DN 40, PN 100	**M23**	✓	✓	✓
• DN 50, PN 16	**M04**	✓	✓	✓
• DN 50, PN 40	**M14**	✓	✓	✓
• DN 80, PN 16	**M06**	✓	✓	✓
• DN 80, PN 40	**M16**	✓	✓	✓
Flanges to ASME B16.5				
• Stainless steel flange 1" class 150[1)]	**M40**	✓	✓	✓
• Stainless steel flange 1½" class 150	**M41**	✓	✓	✓
• Stainless steel flange 2" class 150	**M42**	✓	✓	✓
• Stainless steel flange 3" class 150	**M43**	✓	✓	✓
• Stainless steel flange 4" class 150	**M44**	✓	✓	✓
• Stainless steel flange 1" class 300[1)]	**M45**	✓	✓	✓
• Stainless steel flange 1½" class 300	**M46**	✓	✓	✓
• Stainless steel flange 2" class 300	**M47**	✓	✓	✓
• Stainless steel flange 3" class 300	**M48**	✓	✓	✓
• Stainless steel flange 4" class 300	**M49**	✓	✓	✓
Threaded connector to DIN 3852-2, form A, thread to ISO 228				
• G ¾"-A, front-flush[2)]	**R01**	✓	✓	✓
• G 1"-A, front-flush[2)]	**R02**	✓	✓	✓
• G 2"-A, front-flush[2)]	**R04**	✓	✓	✓
Tank connection[3)] Sealing is included in delivery				
• TG 52/50, PN 40	**R10**	✓	✓	✓
• TG 52/150, PN 40	**R11**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Order No. and specify Order Code.				
Sanitary process connection according DIN 11851 (Dairy connection)				
• DN 50, PN 25	**N04**	✓	✓	✓
• DN 80, PN 25	**N06**	✓	✓	✓
Tri-Clamp connection according DIN 32676/ISO 2852				
• DN 50/2", PN 16	**N14**	✓	✓	✓
• DN 65/3", PN 10	**N15**	✓	✓	✓
Varivent connection Certified to EHEDG				
• Type N = 68 for Varivent housing DN 40 ... 125 und 1½" ... 6", PN 40	**N28**	✓	✓	✓
Temperature decoupler up to 200 °C[4)] for version with front-flush diaphragm	**P00**	✓	✓	✓
Temperature decoupler up to 250 °C Measuring cell filling: High-temperature oil, only in conjunction with measuring cell filling silicone oil	**P10**	✓	✓	✓
Bio-Control sanitary process connection Certified to EHEDG				
• DN 50, PN 16	**Q53**	✓	✓	✓
• DN 65, PN 16	**Q54**	✓	✓	✓
Sanitary process connection to DRD				
• DN 50, PN 40	**M32**	✓	✓	✓
SMS socket with union nut				
• 2"	**M67**	✓	✓	✓
• 2½"	**M68**	✓	✓	✓
• 3"	**M69**	✓	✓	✓
SMS threaded socket				
• 2"	**M73**	✓	✓	✓
• 2½"	**M74**	✓	✓	✓
• 3"	**M75**	✓	✓	✓
IDF socket with union nut ISO 2853				
• 2"	**M82**	✓	✓	✓
• 2½"	**M83**	✓	✓	✓
• 3"	**M84**	✓	✓	✓
IDF threaded socket ISO 2853				
• 2"	**M92**	✓	✓	✓
• 2½"	**M93**	✓	✓	✓
• 3"	**M94**	✓	✓	✓
Sanitary process connection to NEUMO Bio-Connect screw connection Certified to EHEDG				
• DN 50, PN 16	**Q05**	✓	✓	✓
• DN 65, PN 16	**Q06**	✓	✓	✓
• DN 80, PN 16	**Q07**	✓	✓	✓
• DN 100, PN 16	**Q08**	✓	✓	✓
• DN 2", PN 16	**Q13**	✓	✓	✓
• DN 2½", PN 16	**Q14**	✓	✓	✓
• DN 3", PN 16	**Q15**	✓	✓	✓
• DN 4", PN 16	**Q16**	✓	✓	✓
Sanitary process connection to NEUMO Bio-Connect flange connection Certified to EHEDG				
• DN 50, PN 16	**Q23**	✓	✓	✓
• DN 65, PN 16	**Q24**	✓	✓	✓
• DN 80, PN 16	**Q25**	✓	✓	✓
• DN 100, PN 16	**Q26**	✓	✓	✓
• DN 2", PN 16	**Q31**	✓	✓	✓
• DN 2½", PN 16	**Q32**	✓	✓	✓
• DN 3", PN 16	**Q33**	✓	✓	✓
• DN 4", PN 16	**Q34**	✓	✓	✓

SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Order No. and specify Order Code.				
Sanitary process connection to NEUMO Bio-Connect clamp connection Certified to EHEDG				
• DN 50, PN 16	**Q39**	✓	✓	✓
• DN 65, PN 10	**Q40**	✓	✓	✓
• DN 80, PN 10	**Q41**	✓	✓	✓
• DN 100, PN 10	**Q42**	✓	✓	✓
• DN 2½", PN 16	**Q48**	✓	✓	✓
• DN 3", PN 10	**Q49**	✓	✓	✓
• DN 4", PN 10	**Q50**	✓	✓	✓
Sanitary process connection to NEUMO Bio-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 FormA				
• DN 50, PN 25	**N53**	✓	✓	✓
• DN 65, PN 25	**N54**	✓	✓	✓
• DN 80, PN 16	**N55**	✓	✓	✓
• DN 100, PN 16	**N56**	✓	✓	✓

[1] Special seal in Viton included in the scope of delivery.

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

[3] The weldable socket can be ordered under accessories.

[4] The maximum permissible temperatures of the medium depend on the respective cell fillings.

Selection and Ordering data	Order code	HART	PA	FF
Additional data Please add "**-Z**" to Order No. and specify Order code(s) and plain text.				
Calibrated range Specify in plain text (max. 5 characters): Y01: X to Y psi, inH_20, ftH_20...	**Y01**	✓		
Tag number/Identification (max. 16 characters), specify in plain text: Y15:	**Y15**	✓	✓	✓
Tag description (max. 27 characters), specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART (TAG) (max. 8 characters), specify in plain text: Y17:	**Y17**	✓		
Pressure units for digital display specify in plain text: Y21: psi, inH_20, ftH_20 ...	**Y21**	✓	✓	✓
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	**Y25**		✓	

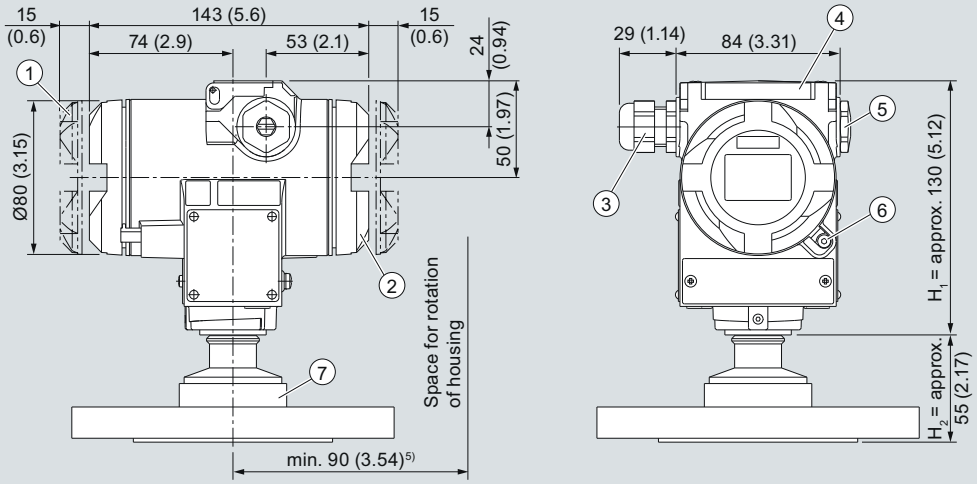
Only "Y01" and "Y21" can be factory preset

✓ = available

Ordering example

Item line:	7MF4133-1DB20-1AB7-Z
B line:	A22 + Y01 + Y21
C line:	Y01: 14.5 ... 145 psi (1 ... 10 bar)
C line:	Y21: psi (bar)

Dimensional drawings



(1) Electronic side, digital display (longer overall length for cover with window)[1)]
(2) Terminal side[1)]
(3) Electrical connection: Screwed gland M20 x 1,5 or screwed gland ½-14 NPT or M12 conector
(4) Protective cover over keys
(5) Blanking plug
(6) Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
(7) Process connection: see flange tables

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

SITRANS P pressure transmitters, DS III series for gauge 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 P300 up to a defined cross-section

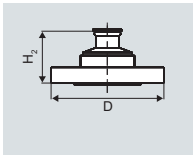
H_2 = Height of the flange up to this defined cross-section

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

Flanges as per EN and ASME

Flange to EN

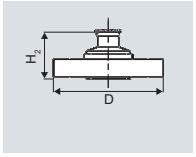
EN 1092-1



DN	PN	∅D	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

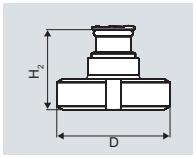


DN	Class	∅D	H_2
1"	150	110 mm (4.3")	Approx. 52 mm (2")
1"	300	125 mm (4.9")	
1½"	150	130 mm (5.1")	
1½"	300	155 mm (6.1")	
2"	150	150 mm (5.9")	
2"	300	165 mm (6.5")	
3"	150	190 mm (7.5")	
3"	300	210 mm (8.1")	
4"	150	230 mm (9.1")	
4"	300	255 mm (10.0")	

F&B and pharmaceutical flanges

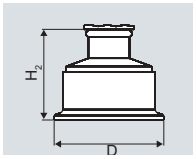
Connections to DIN

DIN 11851 (milk pipe union)



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

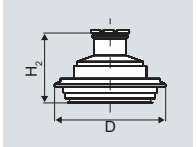
TriClamp to DIN 32676



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

Other connections

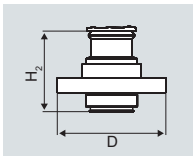
Varivent connection



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

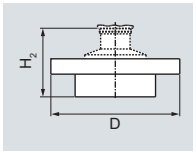
SITRANS P DS III for gauge/absolute pressure, with front-flush diaphragm

Biocontrol connection



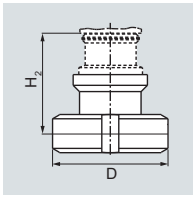
DN	PN	∅D	H_2
50	16	90 mm (3.5")	Approx. 52 mm (2")
65	16	120 mm (4.7")	

Sanitary process connection to DRD



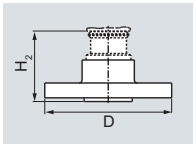
DN	PN	∅D	H_2
50	40	105 mm (4.1")	Approx. 52 mm (2")

Sanitary process screw connection to NEUMO Bio-Connect



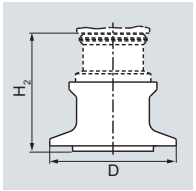
DN	PN	∅D	H_2
50	16	82 mm (3.2")	Approx. 52 mm (2")
65	16	105 mm (4.1")	
80	16	115 mm (4.5")	
100	16	145 mm (5.7")	
2"	16	82 mm (3.2")	
2½"	16	105 mm (4.1")	
3"	16	105 mm (4.1")	
4"	16	145 mm (5.7")	

Sanitary process connection to NEUMO Bio-Connect flange connection



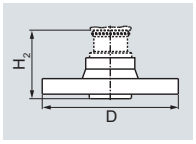
DN	PN	∅D	H_2
50	16	110 mm (4.3")	Approx. 52 mm (2")
65	16	140 mm (5.5")	
80	16	150 mm (5.9")	
100	16	175 mm (6.9")	
2"	16	100 mm (3.9")	
2½"	16	110 mm (4.3")	
3"	16	140 mm (5.5")	
4"	16	175 mm (6.9")	

Sanitary process connection to NEUMO Bio-Connect clamp connection



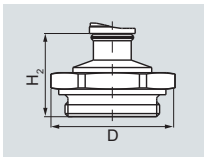
DN	PN	∅D	H_2
50	16	77.4 mm (3.0")	Approx. 52 mm (2")
65	10	90.9 mm (3.6")	
80	10	106 mm (4.2")	
100	10	119 mm (4.7")	
2"	16	64 mm (2.5")	
2½"	16	77.4 mm (3.0")	
3"	10	90.9 mm (3.6")	
4"	10	779 mm (4.7")	

Sanitary process connection to NEUMO Bio-Connect S flange connection



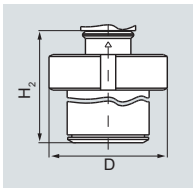
DN	PN	∅D	H_2
50	16	125 mm (4.9")	Approx. 52 mm (2")
65	10	145 mm (5.7")	
80	10	155 mm (6.1")	
100	10	180 mm (7.1")	
2"	16	125 mm (4.9")	
2½"	10	135 mm (5.3")	
3"	10	145 mm (5.7")	
4"	10	180 mm (7.1")	

Threaded connection G¾", G1" and G2" acc. to DIN 3852



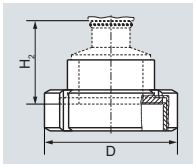
DN	PN	∅D	H_2
¾"	63	37 mm (1.5")	Approx. 45 mm (1.8")
1"	63	48 mm (1.9")	approx. 47 mm (1.9")
2"	63	78 mm (3.1")	Approx. 52 mm (2")

Tank connection TG 52/50 and TG52/150



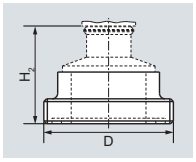
DN	PN	∅D	H_2
25	40	63 mm (2.5")	Approx. 63 mm (2.5")
25	40	63 mm (2.5")	approx. 170 mm (6.7")

SMS socket with union nut



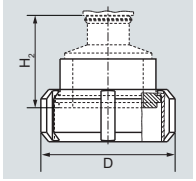
DN	PN	∅D	H_2
2"	25	84 mm (3.3")	Approx. 52 mm (2.1")
2½"	25	100 mm (3.9")	
3"	25	114 mm (4.5")	

SMS threaded socket



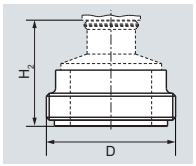
DN	PN	∅D	H_2
2"	25	70 x 1/6 mm	Approx. 52 mm (2.1")
2½"	25	85 x 1/6 mm	
3"	25	98 x 1/6 mm	

IDF socket with union nut



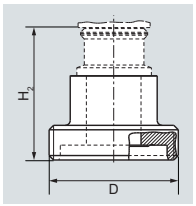
DN	PN	∅D	H_2
2"	25	77 mm (3")	Approx. 52 mm (2.1")
2½"	25	91 mm (3.6")	
3"	25	106 mm (4.2")	

IDF threaded socket



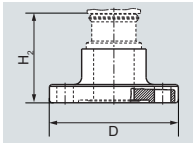
DN	PN	∅D	H_2
2“	25	64 mm (2.5")	Approx. 52 mm (2.1")
2½“	25	77.5 mm (3.1")	
3“	25	91 mm (3.6")	

Aseptic threaded socket to DIN 11864-1 Form A



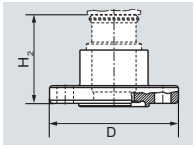
DN	PN	∅D	H_2
50	25	94	Approx. 52 mm (2.1")
65	25	113	
80	25	133	
100	25	159	

Aseptic flange with notch to DIN 11864-2 Form A



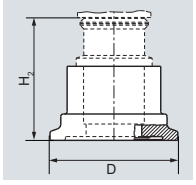
DN	PN	∅D	H_2
50	16	78 x 1/6"	Approx. 52 mm (2.1")
65	16	95 x 1/6"	
80	16	110 x 1/4"	
100	16	130 x 1/4"	

Aseptic flange with groove to DIN 11864-2 Form A



DN	PN	∅D	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	∅D	H_2
50	25	77,5	Approx. 52 mm (2.1")
65	25	91	
80	16	106	
100	16	130	

SITRANS P DS III for absolute pressure (gauge construction)

Technical specifications

SITRANS P DS III series for absolute pressure (gauge construction)				
	HART		**PROFIBUS PA and FOUNDATION Fieldbus**	
Input				
Measured variable	Absolute pressure			
Spans (infinitely adjustable) or nominal measuring range and max. permissible test pressure	Span (min. ... max.)	Max. perm. test pressure	Nominal measuring range	Max. perm. test pressure
	0.12 ... 3.6 psia (8.3 ... 250 mbar a)	87 psia (6 bar a)	3.6 ps a (250 mbar a)	87 psia (6 bar a)
	0.62 ... 18.9 psia (43 ... 1300 mbar a)	145 psia (10 bar a)	18.9 psia (1300 mbar a)	145 psia (10 bar a)
	2.32 ... 72.5 psia (160 ... 5000 mbar a)	435 psia (30 bar a)	72.5 psia (5 bar a)	435 psia (30 bar a)
	14.5 ... 435 psia (1 ... 30 bar a)	1450 psia (100 bar a)	435 psia (30 bar a)	1450 psia (100 bar a)
Lower measuring limit				
• Measuring cell with silicone oil filling	0 psi a (0 mbar a)			
Upper measuring limit	100 % of max. span			
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA and FOUNDATION Fieldbus signal	
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-	
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
Load				
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V		-	
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.			
Measuring accuracy	Acc. to IEC 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 at limit setting incl. hysteresis and reproducibility				
• Linear characteristic			≤ 0.1 %	
- r ≤ 10	≤ 0.1 %			
- 10 < r ≤ 30	≤ 0.2 %			
Long-term stability (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) %[1)]		≤ 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 DS III series for absolute pressure (gauge construction)		
	HART	**PROFIBUS PA and FOUNDATION Fieldbus**
Rated conditions		
Degree of protection (to IEC 60529)	IP65	
Temperature of medium		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)	
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
• Ambient temperature		
- Digital indicator	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
• Electromagnetic Compatibility		
- Emitted interference and interference immunity	Acc. to EN 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 1.5 kg (≈ 3.3 lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
• Connection shank	Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4610	
• 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 (maximum value with oxigen measurement pressure 120 bar a) (1740 psi a)) at 60 °C (140 °F))	
Process connection	Connection shank G½B to EN 837-1, female thread ½ -14 NPT or oval flange (PN 160 (MAWP 2320 psi a)) to DIN 19213 with mounting thread M10 or $^{7}/_{16}$-20 UNF to EN 61518	
Material of mounting bracket		
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel	Sheet stainless steel, mat. no. 1.4301 (SS 304)	
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
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P DS III for absolute pressure (gauge construction)

SITRANS P DS III series for absolute pressure (gauge construction)	HART	PROFIBUS PA and FOUNDATION Fieldbus
Certificates and approvals		
Classification according to PED 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	
- Marking	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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G 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	
- Marking	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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Marking	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
- Marking	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection acc. 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	

1) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.08 · r + 0.16) % / 28 °C (50 °F).

HART communication	
HART	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 to 100 s
- Simulation function	Input /Output
- Failure mode	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Characterizer	Max. 30 points
- Square-rooted characteristic for flow measurement	Yes
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

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

SITRANS P DS III for absolute pressure (gauge construction)

Selection and Ordering data			Order No.
Pressure transmitters for absolute pressure (gauge construction), SITRANS P DS III with HART		F)	7MF4233 -
Measuring cell filling	**Measuring cell cleaning**		
Silicone oil	normal		1
Inert liquid[1]	Grease-free to cleanliness level 2		3
Measuring span (min. ... max.)			
0.12 ... 3.63 psia	(8.3 ... 250 mbar a)		D
0.62 ... 18.9 psia	(43 ... 1300 mbar a)		F
2.32 ... 72.5 psia	(0.16 ... 5 bar a)		G
14.5 ... 435 psia	(1 ... 30 bar a)		H
Wetted parts materials			
Seal diaphragm	Process connection		
Stainless steel	Stainless steel	F)	A
Hastelloy	Stainless steel	F)	B
Hastelloy	Hastelloy	F)	C
Version for diaphragm seal[2)3)4)]			Y 1
Process connection			
• Connection shank G½B to EN 837-1			0
• Female thread ½-14 NPT			1
• Stainless steel oval flange			
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518			2
- Mounting thread M10 to DIN 19213			3
- Mounting thread M12 to DIN 19213			4
• Male thread M20 x 1.5			5
• Male thread ½ -14 NPT			6
Non-wetted parts materials			
• Housing made of die-cast aluminium			0
• Housing stainless steel precision casting[5)]			3
Version			
• Standard versions			1
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)			2
Hazardous area rating			
• General purpose			A
• ATEX Hazardous approval			
- "Intrinsically safe (EEx ia)"			B
- "Explosion-proof (EExd)"[6)]			D
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[7)]			P
- use in zone 2			E
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[7)]			R
• FM/CSA Hazardous approval			
- "Intrinsically Safe und explosion proof (is + xp)"[6)]			N C
Electrical connection / cable entry			
• Screwed gland Pg 13.5[8)]			A
• Screwed gland M20x1.5			B
• ½-14 NPT			C
• Han 7D plug (plastic housing) incl. mating connector[8)]			D
• M12 connectors (metal) [9)]			F

Selection and Ordering data		Order No.
Pressure transmitters for absolute pressure (gauge construction), SITRANS P DS III with HART	F)	7MF4233 -
Indicator		
• Without indicator		0
• Without indicator (digital display hidden, setting: mA)		1
• With indicator (digital display visible, setting: mA)		6
• With indicator (digital display visible, settings as specified, Order Code "Y21"/"Y22" required)		7

Power supply units see Chap. 8 "Supplementary Components".

Included in delivery of the device:
- Brief instructions (Leporello)
- CD-ROM with detailed documentation

1) For oxygen cleaning application, add Order code E10.

2) Version 7MF4233-1DY... only up to max. span 200 mbar a (2.9 psi a).

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

4) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

5) Not in conjunction 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 in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof".

9) M12 delivered without cable socket

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

Selection and Ordering data		Order No.										
Pressure transmitters for absolute pressure (gauge construction)												
SITRANS P DS III with PROFIBUS PA (PA)	F)	**7MF4234-**										
SITRANS P DS III with FOUNDATION Fieldbus (FF)	F)	**7MF4235-**										
							-					
Measuring cell filling / **Measuring cell cleaning**												
Silicone oil / normal			**1**									
Inert liquid[1] / Grease-free to cleanliness level 2			**3**									
Nominal measuring range												
3.63 psia (250 mbar a)				**D**								
18.9 psia (1300 mbar a)				**F**								
72.5 psia (5 bar a)				**G**								
435 psia (30 bar a)				**H**								
Wetted parts materials												
Seal diaphragm / Process connection												
Stainless steel / Stainless steel	F)			**A**								
Hastelloy / Stainless steel	F)			**B**								
Hastelloy / Hastelloy	F)			**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**							
• Stainless steel oval flange												
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518					**2**							
- Mounting thread M10 to DIN 19213					**3**							
- Mounting thread M12 to DIN 19213					**4**							
• Male thread M20 x 1.5					**5**							
• Male thread ½ -14 NPT					**6**							
Non-wetted parts materials												
• Housing made of die-cast aluminium						**0**						
• Housing stainless steel precision casting						**3**						
Version												
• Standard versions							**1**					
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)							**2**					
Hazardous area rating												
• General purpose								**A**				
• ATEX Hazardous approval												
- "Intrinsically safe (EEx ia)"								**B**				
- "Explosion-proof (EExd)"[5)]								**D**				
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[6)]								**P**				
- use in zone 2								**E**				
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[6)]								**R**				
• FM/CSA Hazardous approval												
- "Intrinsically Safe und explosion proof (is + xp)"[5)]								**N**	**C**			
Electrical connection / cable entry												
• Screwed gland M20 x 1.5									**B**			
• ½-14 NPT									**C**			
• M12 connectors (metal) [7)]									**F**			

Selection and Ordering data		Order No.										
Pressure transmitters for absolute pressure (gauge construction)												
SITRANS P DS III with PROFIBUS PA (PA)	F)	**7MF4234-**										
SITRANS P DS III with FOUNDATION Fieldbus (FF)	F)	**7MF4235-**										
							-					
Indicator												
• Without indicator												**0**
• Without indicator (digital display hidden, setting: mA)												**1**
• With indicator (digital display visible, setting: mA)												**6**
• With indicator (digital display visible, settings as specified, Order Code "Y21" required)												**7**

Included in delivery of the device:
- Brief instructions (Leporello)
- CD-ROM with detailed documentation

1) For oxygen cleaning application, add Order code E10.

2) Version 7MF4233-1DY... only up to max. span 200 mbar a (2.9 psi a).

3) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

4) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

5) Without cable gland, with blanking plug

6) With enclosed cable gland EEx ia and blanking plug

7) M12 delivered without cable socket

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

SITRANS P DS III for absolute pressure (gauge construction)

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
Pressure transmitter with mounting bracket (2 shackles, 4 nuts, 4 U-plates, 1 angle) made of:				
• Steel	**A01**	✓	✓	✓
• Stainless steel	**A02**	✓	✓	✓
plug				
• Han 7D (metal, gray)	**A30**	✓		
• Han 8U (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
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 in$H_2$0 and/or psi	**B21**	✓	✓	✓
Factory calibration certificate[1]	**C11**	✓	✓	✓
Material traceability certificate[2]	**C12**	✓	✓	✓
Factory certificate of conformance	**C14**	✓	✓	✓
SIL2 certificate per IEC 61508 / 61511	**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**	✓	✓	✓
Degree of protection IP68 (only for M20 x 1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Supplied with oval flange (1 item), PTFE packing and screws in thread of oval flange	**D37**	✓	✓	✓
Brad Harrison Connector	**D40**	✓	✓	✓
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	**E01**	✓	✓	✓
Oxygen application (In the case of oxygen measurement and inert liquid max. 120 bar a (1740 psi a) at 60°C (140 °F))	**E10**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
Two coats of lacquer on casing and cover (PU on epoxy)	**G10**	✓	✓	✓
Additional data				
Please add "**-Z**" to Order No. and specify Order code(s) and plain text.				
Calibrated range Specify in plain text (max. 5 characters): Y01: X to Y psi, in$H_2$0, ft$H_2$0...	**Y01**	✓		
Tag number/Identification (max. 16 characters), specify in plain text: Y15:	**Y15**	✓	✓	✓
Tag description (max. 27 characters), specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART (TAG) (max. 8 characters), specify in plain text: Y17:	**Y17**	✓		
Pressure units for digital display specify in plain text: Y21: psi, in$H_2$0, ft$H_2$0 ...	**Y21**	✓	✓	✓
Pressure units for digital display				
Non-Pressure units for digital display[3] (measuring range in pressure units ("Y01"/"Y02") mandatory) specify in plain text: Y22: X to Y GPM, MGD, Feet ...	**Y22 + Y01**	✓		
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	**Y25**		✓	

Factory mounting of valve manifolds, see accessories.

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

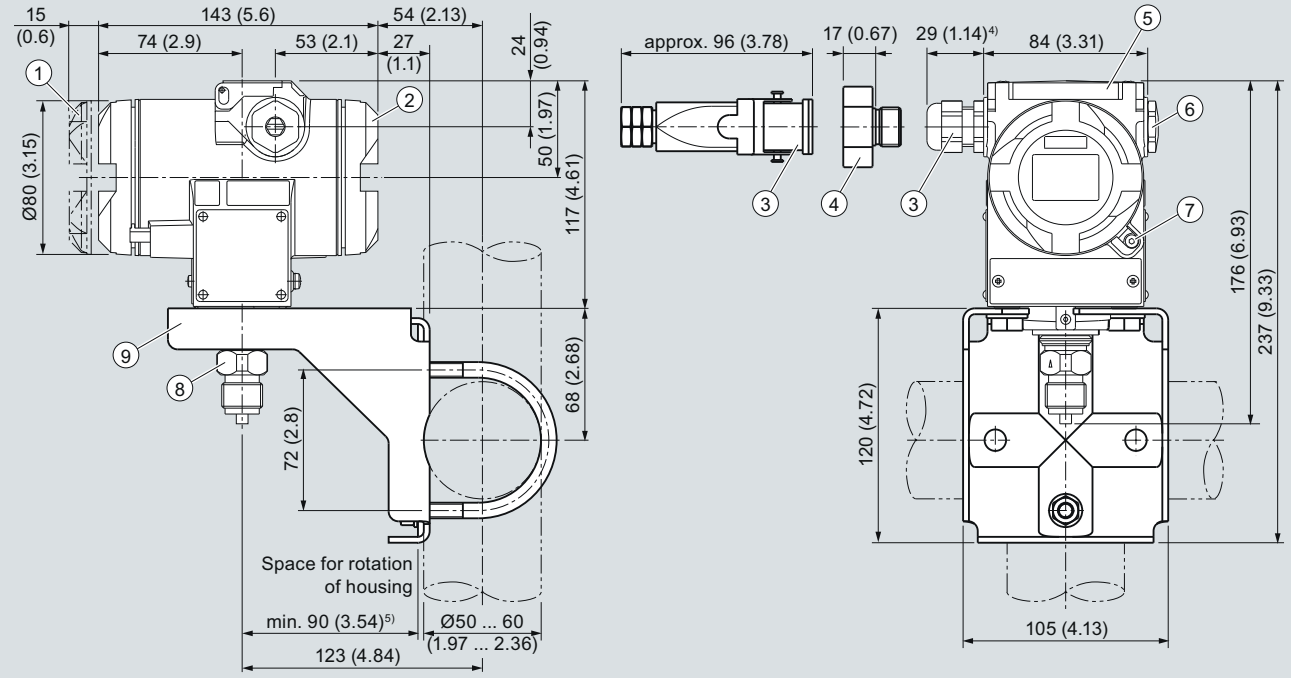
✓ = available

1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

2) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

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

Dimensional drawings



1. Electronic side, digital display (longer overall length for cover with window)[1]
2. Terminal side[1]
3. Electrical connection: Screwed gland Pg 13,5 (adapter)(Adapter)[2][3], Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/Han 8D[2][3] plug
4. Harting adapter
5. Protective cover over keys
6. Blanking plug
7. Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
8. Process connection: Connection shank G½A or Oval flange
9. Mounting bracket (option)

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

SITRANS P DS III for absolute pressure (differential construction)

Technical specifications

SITRANS P, DS III for absolute pressure (differential construction)

	HART		PROFIBUS PA and FOUNDATION Fieldbus	
Input				
Measured variable	Absolute pressure			
Spans (infinitely adjustable) or nominal measuring range and max. permissible operating pressure	Span (min. ... max.)	Maximum operating pressure	Nominal measuring range	Maximum operating pressure
	0.12 ... 3.6 psia (8.3 ... 250 mbar a)	464 psia (32 bar a)	3.6 psia (250 mbar a)	464 psia (32 bar a)
	0.62 ... 18.9 psia (43 ... 1300 mbar a)	464 psia (32 bar a)	18.9 psia (1300 bar a)	464 psia (32 bar a)
	2.32 ... 72.5 psia (160 ... 5000 mbar a)	464 psia (32 bar a)	72.5 psia (5 bar a)	464 psia (32 bar a)
	14.5 ... 435 psia (1 ... 30 bar a)	2320 psia (160 bar a)	435 psia (30 bar a)	2320 psia (160 bar a)
	77 ... 1450 psia (5.3 ... 100 bar a)	2320 psia (160 bar a) (for connection thread M10 and $^{7}/_{16}$-20 UNF in the process flanges)	1450 psia (100 bar a)	2320 psia (160 bar a) (for connection thread M10 and $^{7}/_{16}$-20 UNF in the process flanges)
Lower measuring limit				
• Measuring cell with silicone oil filling	0 psi a (0 mbar a)			
Upper measuring limit	100 % of max. span			
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA and FOUNDATION Fieldbus signal	
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-	
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
Load				
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V		-	
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.			
Measuring accuracy	Acc. to IEC 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 at limit setting incl. hysteresis and reproducibility				
• Linear characteristic			≤ 0.1 %	
- r ≤ 10	≤ 0.1 %			
- 10 < r ≤ 30	≤ 0.2 %			
Long-term stability (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) %[1)]		≤ 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, DS III for absolute pressure (differential construction)		
	HART	**PROFIBUS PA and FOUNDATION Fieldbus**
Rated conditions		
Degree of protection (to IEC 60529)	IP65, optional IP68	
Temperature of medium		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)	
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
• Ambient temperature		
- Digital indicator	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
• Electromagnetic Compatibility		
- Emitted interference and interference immunity	Acc. to EN 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 4.5 kg (≈ 9.9 (lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AlSi12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819, 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 (maximum value with oxigen measurement pressure 120 bar a) (1740 psi a) at 60 °C (140 °F))	
Process connection	¼-18 NPT and flange connection with mounting thread M10 to DIN 19213 or $^{7}/_{16}$-20 UNF to IEC 61518	
Material of mounting bracket		
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel	Sheet stainless steel, mat. no. 1.4301 (SS 304)	
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
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P DS III for absolute pressure (differential construction)

SITRANS P, DS III for absolute pressure (differential construction)	HART	PROFIBUS PA and FOUNDATION Fieldbus
Certificates and approvals		
Classification according to PED 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	
- Marking	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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G 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	
- Marking	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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Marking	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
- Marking	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection acc. 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	

1) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.08 · r + 0.16) % / 28 °C (50 °F).

HART communication	
HART	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Characterizer	Max. 30 points
- Square-rooted characteristic for flow measurement	Yes
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

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

SITRANS P DS III for absolute pressure (differential construction)

Selection and Ordering data			Order No.
Pressure transmitters for absolute pressure (differential conctruction), SITRANS P DS III with HART		F)	**7MF4333-**
Measuring cell filling	**Measuring cell cleaning**		
Silicone oil	normal		**1**
Inert liquid[1]	Grease-free to cleanliness level 2		**3**
Measuring span (min. ... max.)			
0.12 ... 3.63 psia	(8.3 ... 250 mbar a)	E)	**D**
0.62 ... 18.9 psia	(43 ... 1300 mbar a)	E)	**F**
2.32 ... 72.5 psia	(0.16 ... 5 bar a)	E)	**G**
14.5 ... 435 psia	(1 ... 30 bar a)		**H**
76.9 ... 1450 psia	(5.3 ... 100 bar 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 for diaphragm seal[2)3)4)]			**Y**
Process connection			
Female thread ¼-18 NPT with flange connection			
• Sealing screw opposite process connection			
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518			**2**
- Mounting thread M10 to DIN 19213 (only for replacement requirement)			**0**
• Vent on side of process flange [5)]			
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518			**6**
- Mounting thread M10 to DIN 19213 (only for replacement requirement)			**4**
Non-wetted parts materials			
process flange screws	Electronics housing		
Stainless steel	Die-cast aluminum		**2**
Stainless steel	Stainless steel precision casting[6)]		**3**
Version			
• Standard versions			**1**
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)			**2**
Hazardous area rating			
• General purpose			**A**
• ATEX Hazardous approval			
- "Intrinsically safe (EEx ia)"			**B**
- "Explosion-proof (EExd)"[7)]			**D**
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[8)]			**P**
- use in zone 2			**E**
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[8)]			**R**
• FM/CSA Hazardous approval			
- "Intrinsically Safe und explosion proof (is + xp)"[7)]			**N C**
Electrical connection / cable entry			
• Screwed gland Pg 13.5[9)]			**A**
• Screwed gland M20 x 1.5			**B**
• ½-14 NPT			**C**
• Han 7D plug (plastic housing) incl. mating connector[9)]			**D**
• M12 connectors (metal)[10)]			**F**

Selection and Ordering data		Order No.
Pressure transmitters for absolute pressure (differential conctruction), SITRANS P DS III with HART	F)	**7MF4333-**
Indicator		
• Without indicator		**0**
• Without indicator (digital display hidden, setting: mA)		**1**
• With indicator (digital display visible, setting: mA)		**6**
• With indicator (digital display visible, settings as specified, Order Code "Y21" required)		**7**

Power supply units see Chap. 8 "Supplementary Components".

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 cleaning applications, add Order code E10.

2) Version 7MF4333-1DY... only up to max. span 200 mbar a (2.9 psi a).

3) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

4) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

5) Not for span "5.3 ... 100 bar a (76.9 ... 1450 psia)". Position of the top vent valve in the process flange (see dimensional drawings).

6) Not in conjunction 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 in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof".

10) M12 delivered without cable socket

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.

Selection and Ordering data		Order No.										
Pressure transmitter for absolute pressure (differential construction)												
SITRANS P DS III with PROFIBUS PA (PA)	F)	**7MF4334-**										
SITRANS P DS III with FOUNDATION Fieldbus (FF)	F)	**7MF4335-**										
							-					
Measuring cell filling	**Measuring cell cleaning**											
Silicone oil	normal		**1**									
Inert liquid[1]	Grease-free to cleanliness level 2		**3**									
Nominal measuring range												
3.63 psia	(250 mbar a)	E)		**D**								
18.9 psia	(1300 mbar a)	E)		**F**								
72.5 psia	(5 bar a)	E)		**G**								
435 psia	(30 bar a)			**H**								
1450 psia	(100 bar 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 ¼-18 NPT with flange connection												
• Sealing screw opposite process connection												
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518						**2**						
- Mounting thread M10 to DIN 19213 (only for replacement requirement)						**0**						
• Vent on side of process flange [5)]												
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518						**6**						
- Mounting thread M10 to DIN 19213 (only for replacement requirement)						**4**						
Non-wetted parts materials												
process flange screws	Electronics housing											
Stainless steel	Die-cast aluminum						**2**					
Stainless steel	Stainless steel precision casting						**3**					
Version												
• Standard versions								**1**				
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)								**2**				
Hazardous area rating												
• General purpose									**A**			
• ATEX Hazardous approval												
- "Intrinsically safe (EEx ia)"									**B**			
- "Explosion-proof (EExd)"[6)]									**D**			
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[7)]									**P**			
- use in zone 2									**E**			
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[7)]									**R**			
• FM/CSA Hazardous approval												
- "Intrinsically Safe und explosion proof (is + xp)"[6)]									**N**	**C**		
Electrical connection / cable entry												
• Screwed gland M20 x 1.5										**B**		
• ½-14 NPT										**C**		
• M12 connectors (metal)[8)]										**F**		

Selection and Ordering data		Order No.										
Pressure transmitter for absolute pressure (differential construction)												
SITRANS P DS III with PROFIBUS PA (PA)	F)	**7MF4334-**										
SITRANS P DS III with FOUNDATION Fieldbus (FF)	F)	**7MF4335-**										
							-					
Indicator												
• Without indicator											**0**	
• Without indicator (digital display hidden, setting: mA)											**1**	
• With indicator (digital display visible, setting: mA)											**6**	
• With indicator (digital display visible, settings as specified, Order Code "Y21" required)											**7**	

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 cleaning application, add Order code E10.

2) Version 7MF4334-1DY... only up to max. span 200 mbar a (2.9 psi a).

3) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

4) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

5) Not for nominal measuring range 100 bar a (1450 psi a). Position of the top vent valve in the process flange (see dimensional drawings).

6) Without cable gland, with blanking plug

7) With enclosed cable gland EEx ia and blanking plug

8) M12 delivered without cable socket

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 DS III for absolute pressure (differential construction)

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Order No. and specify Order Code.				
Pressure transmitter with mounting bracket (2 shackles, 4 nuts, 4 U-plates, 1 angle) 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**	✓	✓	✓
• FFPM (Kalrez, compound 4079)	**A22**	✓	✓	✓
• NBR (Buna N)	**A23**	✓	✓	✓
plug				
• Han 7D (metal, gray)	**A30**	✓		
• Han 8U (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
Sealing screw ¼-18 NPT, with valve in mat. of process flanges	**A40**	✓	✓	✓
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_20 and/or psi	**B21**	✓	✓	✓
Factory calibration certificate[1)]	**C11**	✓	✓	✓
Material traceability certificate[2)]	**C12**	✓	✓	✓
Factory certificate of conformance	**C14**	✓	✓	✓
SIL2 certificate per IEC 61508 / 61511	**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**	✓	✓	✓
Degree of protection IP68 (only for M20 x 1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Supplied with oval flange (1 item), PTFE packing and screws in thread of process flange	**D37**	✓	✓	✓
Brad Harrison Connector	**D40**	✓	✓	✓
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	**E01**	✓	✓	✓
Oxygen application (In the case of oxygen measurement and inert liquid max. 120 bar a (1740 psi a) at 60°C (140 °F))	**E10**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Order No. and specify Order Code.				
Two coats of lacquer on casing and cover (PU on epoxy)	**G10**	✓	✓	✓
Interchanging of process connection side	**H01**	✓	✓	✓
Vent on side for gas measurements	**H02**	✓	✓	✓
Process flange				
• Hastelloy	**K01**[F)]	✓	✓	✓
• Monel	**K02**[F)]	✓	✓	✓
• Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi), max. temperature of medium 90 °C (194 °F) For ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible	**K04**[F)]	✓	✓	✓
Surge Protection External, ½" NPT	**J01**			
Manifold Mounting				
• Assembled for 3-valve manifold 7MF9411-5BA-Z+K36,Chromized steel screws, PTFE-gaskets, and pressure test	**U01**			
• Assembled for 3-valve manifold 7MF9411-5BA-Z+K46, Stainless stelle screws, PTFE-gaskets, and pressure test	**U02**			

Selection and Ordering data	Order code	HART	PA	FF
Additional data				
Please add "**-Z**" to Order No. and specify Order code(s) and plain text.				
Calibrated range Specify in plain text (max. 5 characters): Y01: X to Y psi, inH_20, ftH_20...	**Y01**	✓		
Tag number/Identification (max. 16 characters), specify in plain text: Y15:	**Y15**	✓	✓	✓
Tag description (max. 27 characters), specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART (TAG) (max. 8 characters), specify in plain text: Y17:	**Y17**	✓		
Pressure units for digital display specify in plain text: Y21: psi, inH_20, ftH_20 ...	**Y21**	✓	✓	✓
Pressure units for digital display				
Non-Pressure units for digital display[3] (measuring range in pressure units ("Y01"/"Y02") mandatory) specify in plain text: Y22: X to Y GPM, MGD, Feet ...	**Y22 + Y01**	✓		
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	**Y25**		✓	

Factory mounting of valve manifolds, see accessories.

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

✓ = available

1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

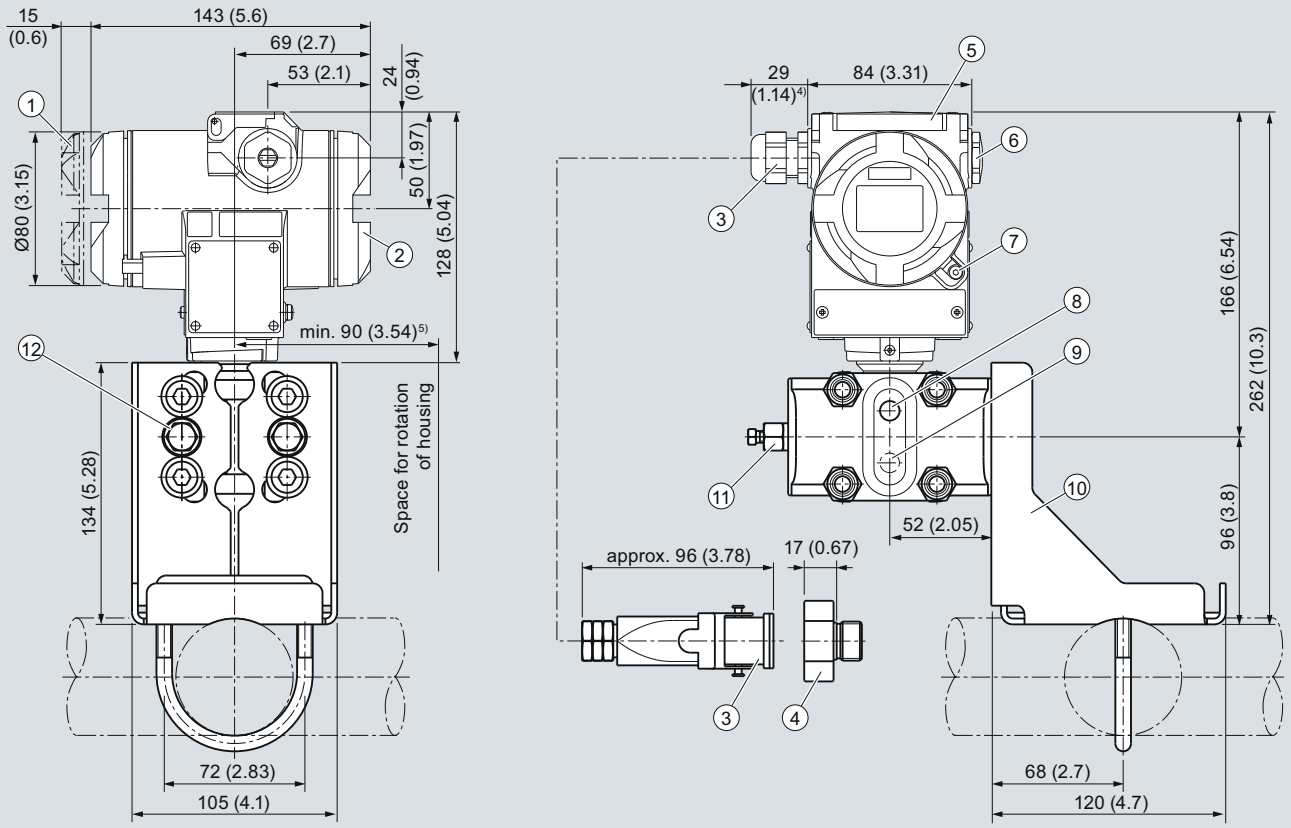
2) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

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

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

SITRANS P DS III for absolute pressure (differential construction)

Dimensional drawings



1. Electronic side, digital display (longer overall length for cover with window)[1]
2. Terminal side[1]
3. Electrical connection: Screwed gland Pg 13,5 (adapter)(Adapter)[2][3], Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/ Han 8D[2][3] plug
4. Harting adapter
5. Protective cover over keys
6. Blanking plug
7. Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
8. Lateral venting for liquid measurement (Standard)
9. Lateral venting for gas measurement (suffix H02)
10. Mounting bracket (option)
11. Sealing screw with valve (option)
12. Process connection: ¼-18 NPT (IEC 61518)

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) For Pg 13,5 with adapter approx. 45 mm (1.77 inch)

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

Technical specifications

SITRANS P, DS III for differential pressure and flow

	HART		PROFIBUS PA and FOUNDATION Fieldbus	
Input				
Measured variable	Differential pressure and flow			
Spans (infinitely adjustable) or nominal measuring range and max. permissible operating pressure	Span (min. ... max.)	Maximum operating pressure	Nominal measuring range	Maximum operating pressure
	0.4 ... 8 inH_2O (1 ... 20 mbar)	464 psi (32 bar)	8 inH_2O (20 mbar g)	464 psi (32 bar)
	0.4 ... 24 inH_2O (1 ... 60 mbar)	2320 psi (160 bar)	24 inH_2O (60 mbar)	2320 psi (160 bar)
	1 ... 100 inH_2O (2.5 ... 250 mbar)		100 inH_2O (250 mbar)	
	2.4 ... 240 inH_2O (6 ... 600 mbar)		240 inH_2O (600 mbar)	
	6.4 ... 642 inH_2O (16 ... 1600 mbar)		642 inH_2O (1600 mbar)	
	20 ... 2000 inH_2O (50 ... 5000 mbar)		2000 inH_2O (5 bar)	
	4.35 ... 435 psi (0.3 ... 30 bar)		435 psi (30 bar)	
	1 ... 100 inH_2O (2.5 ... 250 mbar)	6091 psi (420 bar)	100 inH_2O (250 mbar)	6091 psi (420 bar)
	2.4 ... 240 inH_2O (6 ... 600 mbar)		240 inH_2O (600 mbar)	
	6.4 ... 642 inH_2O (16 ... 1600 mbar)		642 inH_2O (1600 mbar)	
	20 ... 2000 inH_2O (50 ... 5000 mbar)		2000 inH_2O (5 bar)	
	4.35 ... 435 psi (0.3 ... 30 bar)		435 psi (30 bar)	
Lower measuring limit				
• Measuring cell with silicone oil filling	-100% of max. span (-33% with 435 psi (30 bar) measuring cell or 0.44 psia (30 mbar a))			
Upper measuring limit	100% of max. span (for oxygen version and inert filling liquid; max. 1740 psi(120 bar))			
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA and FOUNDATION Fieldbus signal	
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-	
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
Load				
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V		-	
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.			
Measuring accuracy	Acc. to IEC 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 at limit setting incl. hysteresis and reproducibility				
• 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-rooted characteristic (flow > 50 %)			≤ 0,1 %	
- r ≤ 10	≤ 0.1 %			
- 10 < r ≤ 30	≤ 0.2 %			

SITRANS P, DS III for differential pressure and flow	HART	PROFIBUS PA and FOUNDATION Fieldbus
• Square-rooted characteristic (flow > 25 ... 50 %)		≤ 0.2
- r ≤ 10	≤ 0.2 %	
- 10 < r ≤ 30	≤ 0.4 %	
Long-term stability (temperature change ± 30 °C (±5 4 °F))	≤ (0.25 · r)% every 5 years static pressure max. 1015 psi (70 bar)	≤ 0.25 % every 5 years static pressure max. 1015 psi (70 bar)
• 8 inH_2O (20 mbar)-measuring cell	≤ (0.2 · r) per year	≤ 0.2 per year
• 100, 240, 640 et 2000 inH_2O (250, 600, 1600 and 5000 mbar)-measuring cell	≤ (0.125 · r) per year	≤ 0.125 per year
Influence of ambient temperature		
• at -10 ... +60 °C (14 ... 140 °F)	≤ (0.08 · r + 0.1) %[1)]	≤ 0.3 %
• at -40 ... -10 °C and 60 ... 85 °C (-40 ... +14 °F and 140 ... 185 °F)	≤ (0.1 · r + 0.15)%/10 K (Twice the value with 8 inH_2O (20-mbar) measuring cell)	≤ 0.25 %/10 K
Influence of static pressure		
• on the zero point (PKN)	≤ (0.15 · r)% per 1015 psi (70 bar)	≤ 0.15 % per 1015 psi (70 bar)
- 8 inH_2O (20 mbar)-measuring cell	≤ (0.15 · r)% per 464 psi (32 bar)	≤ 0.15 % per 464 psi (32 bar)
• on the span (PKS)	≤ 0.14 % per 1015 psi (70 bar)	-
- 8 inH_2O (20 mbar)-measuring cell	≤ 0.2 % per 464 psi (32 bar)	-
Measured Value Resolution	-	3 · 10^{-5} of nominal measuring range
Rated conditions		
Degree of protection (to IEC 60529)	IP65, optional IP68	
Temperature of medium		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)	
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
• Ambient temperature		
- Digital indicator	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
• Electromagnetic Compatibility		
- Emitted interference and interference immunity	Acc. to EN 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 4.5 kg (≈ 9.9 (lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AlSi12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold	
Measuring cell filling	Silicone oil or inert filling liquid (maximum value with oxigen measurement pressure 1740 psia) (120 bar a) at 60 °C (140 °F))	
Process connection	Female thread ¼-18 NPT and flange connection with mounting thread M10 to DIN 19213 or $^{7}/_{16}$-20 UNF to IEC 61518	
Material of mounting bracket		
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel	Sheet stainless steel, mat. no. 1.4301 (SS 304)	
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

SITRANS P, DS III for differential pressure and flow		
	HART	**PROFIBUS PA and FOUNDATION Fieldbus**
Current consumption		
• Basic current (max.)	-	12.5 mA
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes
Certificates and approvals		
Classification according to PED 97/23/EC		
PN 32/160 (MAWP 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 (MAWP 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	
- Marking	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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G 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	
- Marking	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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Marking	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
- Marking	Ex II 3 G EEx nA L IIC T4/T5/T6	-
• Explosion protection acc. 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	

[1] Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.064 · r + 0.08) % / 28 °C (50 °F).

SITRANS P DS III for differential pressure and flow

HART communication	
HART	230 ... 1100 Ω
Protocol	HART Version 5.x
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- Simulation function	Input /Output
- Failure mode	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Characterizer	Max. 30 points
- Square-rooted characteristic for flow measurement	Yes
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

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

Selection and Ordering data		Order No.
SITRANS P DS III with HART pressure transmitters for differential pressure and flow, MAWP 464/2320 psi (PN 32/160)		**7MF4433 -**
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Inert liquid[1]	Grease-free to cleanliness level 2	3
Measuring span		
MAWP 464 psi (PN 32)		
0.4 ... 8 inH_2O[2]	(1 ... 20 mbar)[2]	B
MAWP 2320 psi (PN 160)		
0.4 ... 24 inH_2O	(1 ... 60 mbar)	C
1 ... 100 inH_2O	(2.5 ... 250 mbar)	D
2.4 ... 240 inH_2O	(6 ... 600 mbar)	E
6.4 ... 642 inH_2O	(16 ... 1600 mbar)	F
20 ... 2000 inH_2O	(50 ... 5000 mbar)	G
4.35 ... 435 psi	(0.3 ... 30 bar)	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 ¼-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518		2
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		0
• Vent on side of process flange [2]		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518		6
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		4
Non-wetted parts materials		
process flange screws	Electronics housing	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting[6]	3
Version		
• Standard versions		1
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)		2
Hazardous area rating		
• General purpose		A
• ATEX Hazardous approval		
- "Intrinsically safe (EEx ia)"		B
- "Explosion-proof (EExd)"[7]		D
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[8]		P
- use in zone 2		E
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[8]		R
• FM/CSA Hazardous approval		
- "Intrinsically Safe und explosion proof (is + xp)"[7]		N C

Selection and Ordering data	Order No.
SITRANS P DS III with HART pressure transmitters for differential pressure and flow, MAWP 464/2320 psi (PN 32/160)	**7MF4433 -**
Electrical connection / cable entry	
• Screwed gland Pg 13.5[9]	A
• Screwed gland M20 x 1.5	B
• ½-14 NPT	C
• Han 7D plug (plastic housing) incl. mating connector[9][10]	D
• M12 connectors (metal)[11]	F
Indicator	
• Without indicator	0
• Without indicator (digital display hidden, setting: mA)	1
• With indicator (digital display visible, setting: mA)	6
• With indicator (digital display visible, settings as specified, Order Code "Y21"/Y22" required)	7

Power supply units see Chap. 8 "Supplementary Components".

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 cleaning 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 drawings).

3) Not in conjunction with max. span 20 and 60 mbar (8 und 24 inH_2O))

4) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

5) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

6) Not in conjunction 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 in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof".

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

11) M12 delivered without cable socket

SITRANS P DS III for differential pressure and flow

Selection and Ordering data		Order No.
Pressure transmitters for differential pressure and flow MAWP 464/2320 psi (PN 32/160)		
SITRANS P DS III with PROFIBUS (PA)		7MF4434-
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7MF4435-
		■■■■■-■■■■
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Inert liquid[1]	Grease-free to cleanliness level 2	3
Nominal measuring range (min. ... max.)		
MAWP 464 psi (PN 32)		
8 inH_2O[2]	(20 mbar)[2]	B
MAWP 2320 psi (PN 160)		
24 inH_2O	(60 mbar)	C
100 inH_2O	(250 mbar)	D
240 inH_2O	(600 mbar	E
642 inH_2O	(1600 mbar)	F
2000 inH_2O	(5 bar)	G
435 psi	(30 bar)	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 as diaphragm seal [4][5]		Y
Process connection		
Female thread ¼-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518		2
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		0
• Venting on side of process flanges[2]		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518		6
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		4
Non-wetted parts materials		
process flange screws	Electronics housing	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting	3
Version		
• Standard versions		1
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)		2
Hazardous area rating		
• General purpose		A
• ATEX Hazardous approval		
- "Intrinsically safe (EEx ia)"		B
- "Explosion-proof (EExd)"[6]		D
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[7]		P
- use in zone 2		E
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[7]		R
• FM/CSA Hazardous approval		
- "Intrinsically Safe und explosion proof (is + xp)"[6]		NC

Selection and Ordering data	Order No.
Pressure transmitters for differential pressure and flow MAWP 464/2320 psi (PN 32/160)	
SITRANS P DS III with PROFIBUS (PA)	7MF4434-
SITRANS P DS III with FOUNDATION Fieldbus (FF)	7MF4435-
	■■■■■-■■■■
Electrical connection / cable entry	
• Screwed gland M20 x 1.5	B
• ½-14 NPT	C
• M12 connectors (metal)[8]	F
Indicator	
• Without indicator	0
• Without indicator (digital display hidden, setting: mA)	1
• With indicator (digital display visible, setting: mA)	6
• With indicator (digital display visible, settings as specified, Order Code "Y21"/Y22" required)	7

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 cleaning 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 drawings).

3) Not in conjunction with max. span 20 and 60 mbar (8 und 24 inH_2O))

4) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

5) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

6) Without cable gland, with blanking plug

7) With enclosed cable gland EEx ia and blanking plug

8) M12 delivered without cable socket

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
Pressure transmitter with mounting bracket (2 shackles, 4 nuts, 4 U-plates, 1 angle) 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**	✓	✓	✓
• FFPM (Kalrez, compound 4079)	**A22**	✓	✓	✓
• NBR (Buna N)	**A23**	✓	✓	✓
plug				
• Han 7D (metal, gray)	**A30**	✓		
• Han 8U (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
Sealing screws (2 unit(s)) ¼-18 NPT, with valve in mat. of process flanges	**A40**	✓	✓	✓
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_2O and/or psi	**B21**	✓	✓	✓
Factory calibration certificate[1]	**C11**	✓	✓	✓
Material traceability certificate[2]	**C12**	✓	✓	✓
Factory certificate of conformance	**C14**	✓	✓	✓
SIL2 certificate per IEC 61508 / 61511	**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**	✓	✓	✓
Degree of protection IP68 (only for M20 x 1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Process flange screws made of Monel (max. nominal pressure PN20)	**D34**	✓	✓	✓
Supplied with oval flange set (2 items), PTFE packings and screws in thread of process flanges	**D37**	✓	✓	✓
Brad Harrison Connector	**D40**	✓	✓	✓
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	**E01**	✓	✓	✓
TÜV approval to AD/TRD (only together with type of protection "Intrinsic safety (EEx ia)")	**E06**	✓		

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
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**	✓	✓	✓
Oxygen application (In the case of oxygen measurement and inert liquid max. 120 bar a (1740 psi a) at 60°C (140 °F))	**E10**	✓	✓	✓
Two coats of lacquer on casing and cover (PU on epoxy)	**G10**	✓	✓	✓
Interchanging of process connection side	**H01**	✓	✓	✓
Vent on side for gas measurements	**H02**	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines (not together with K01, K02 and K04)[3]	**H03**	✓	✓	✓
Process flange				
• Hastelloy	**K01**	✓	✓	✓
• Monel	**K02**	✓	✓	✓
• Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi), max. temperature of medium 90 °C (194 °F)	**K04**	✓	✓	✓
Surge Protection				
External, ½" NPT	**J01**			
Manifold Mounting				
Assembled for 3-valve manifold 7MF9411-5BA-Z+K36, Chromized steel screws, PTFE-gaskets, and pressure test	**U01**			
Assembled for 3-valve manifold 7MF9411-5BA-Z+K46, Stainless steel screws, PTFE-gaskets, and pressure test	**U02**			
Assembled for 5-valve manifold 7MF9411-5CA-Z+K36, Chromized steel screws, PTFE-gaskets, and pressure test	**U03**			
Assembled for 5-valve manifold 7MF9411-5CA-Z+K46, Stainless steel screws, PTFE-gaskets, and pressure test	**U04**			

Factory mounting of valve manifolds, see accessories.

Supplementary electronics for 4-wire connection, see accessories.

For ½-14 NPT inner process connection on the side in the middle of the process flanges, vent valve not possible

✓ = available

1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

2) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.

3) Not suitable for connection of remote seal

SITRANS P DS III for differential pressure and flow

Selection and Ordering data	Order code	HART	PA	FF
Additional data Please add "**-Z**" to Order No. and specify Order code(s) and plain text.				
Calibrated range Specify in plain text: • in the case of linear characteristic curve (max. 5 characters): Y01: X to Y psi, in$H_2$0, ft$H_2$0... • in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	**Y01** **Y02**	✓ ✓		
Tag number/Identification (max. 16 characters), specify in plain text: Y15:	**Y15**	✓	✓	✓
Tag description (max. 27 characters), specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART (TAG) (max. 8 characters), specify in plain text: Y17:	**Y17**	✓		
Pressure units for digital display specify in plain text: Y21: psi, in$H_2$0, ft$H_2$0 ...	**Y21**	✓	✓	✓
Pressure units for digital display				
Non-Pressure units for digital display[1] (measuring range in pressure units ("Y01"/"Y02") mandatory) specify in plain text: Y22: X to y GPM, MGD, Feet ...	**Y22**[2]**+ Y01** *or* **Y02**	✓		
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	**Y25**		✓	

Factory mounting of valve manifolds, see accessories.

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

✓ = available

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

2) Not in conjunction with over-filling safety device for flammable and non-flammable liquids (Order Code "E08")

Selection and Ordering data		Order No.
SITRANS P DS III with HART pressure transmitters for differential pressure and flow, MAWP 6092 psi (PN 420)		**7MF4533-**
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Measuring span (min. ... max.)		
1 ... 100 inH_2O	(2.5 ... 250 mbar)	D
2.4 ... 240 inH_2O	(6 ... 600 mbar)	E
6.4 ... 642 inH_2O	(16 ... 1600 mbar)	F
20 ... 2000 inH_2O	(50 ... 5000 mbar)	G
4.35 ... 435 psi	(0.3 ... 30 bar)	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
Connection of remote seal possible on request		
Process connection		
Female thread ¼-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518		3
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		1
• Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing)		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518		7
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		5
Non-wetted parts materials		
process flange screws	Electronics housing	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting[2]	3
Version		
• Standard versions		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Hazardous area rating		
• General purpose		A
• ATEX Hazardous approval		
- "Intrinsically safe (EEx ia)"		B
- "Explosion-proof (EExd)"[3]		D
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[4]		P
- use in zone 2		E
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[4]		R
• FM/CSA Hazardous approval		
- "Intrinsically Safe und explosion proof (is + xp)"[3]		N C
Electrical connection / cable entry		
• Screwed gland Pg 13.5[5]		A
• Screwed gland M20x1.5		B
• ½-14 NPT		C
• Han 7D plug (plastic housing) incl. mating connector[5][6]		D
• M12 connectors (metal)[7]		F

Selection and Ordering data	Order No.
SITRANS P DS III with HART pressure transmitters for differential pressure and flow, MAWP 6092 psi (PN 420)	**7MF4533-**
Indicator	
• Without indicator	0
• Without indicator (digital display hidden, setting: mA)	1
• With indicator (digital display visible, setting: mA)	6
• With indicator (digital display visible, settings as specified, Order Code "Y21"/Y22" required)	7

Power supply units see Chap. 8 "Supplementary Components".

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

1) Not in conjunction with max. span 600 mbar (240 inH_2O)
2) Not in conjunction 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 in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof".
6) Permissible only for crimp-contact of conductor cross-section 1 mm^2
7) M12 delivered without cable socket

SITRANS P DS III for differential pressure and flow

Selection and Ordering data		Order No.
Pressure transmitters for differential pressure and flow, MAWP 6092 psi (PN 420)		
SITRANS P DS III with PROFIBUS PA (PA)		7MF4534-
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7MF4535-
		1 ▢▢▢▢ - ▢▢▢▢
Nominal measuring range		
100 inH_2O	(250 mbar)	D
240 inH_2O	(600 mbar)	E
642 inH_2O	(1600 mbar)	F
2000 inH_2O	(5 bar)	G
435 psi	(30 bar)	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
Connection of remote seal possible on request		
Process connection		
Female thread ¼-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518		3
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		1
• Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing).		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518		7
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		5
Non-wetted parts materials		
Process flange screws	Electronics housing	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting	3
Version		
• Standard versions		1
• International version, English label inscriptions, documentation in 5 languages on CD		2
Hazardous area rating		
• General purpose		A
• ATEX Hazardous approval		
- "Intrinsically safe (EEx ia)"		B
- "Explosion-proof (EExd)"[2]		D
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[3]		P
- use in zone 2		E
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[3]		R
• FM/CSA Hazardous approval		
- "Intrinsically Safe und explosion proof (is + xp)"[2]		N C
Electrical connection / cable entry		
• Screwed gland M20 x 1.5		B
• ½-14 NPT		C
• M12 connectors (metal)[4]		F

Selection and Ordering data	Order No.
Pressure transmitters for differential pressure and flow, MAWP 6092 psi (PN 420)	
SITRANS P DS III with PROFIBUS PA (PA)	7MF4534-
SITRANS P DS III with FOUNDATION Fieldbus (FF)	7MF4535-
	1 ▢▢▢▢ - ▢▢▢▢
Indicator	
• Without indicator	0
• Without indicator (digital display hidden, setting: mA)	1
• With indicator (digital display visible, setting: mA)	6
• With indicator (digital display visible, settings as specified, Order Code "Y21" required)	7

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 in conjunction with max. span 600 mbar (240 inH_2O)

[2] Without cable gland, with blanking plug

[3] With enclosed cable gland EEx ia and blanking plug

[4] M12 delivered without cable socket

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
Pressure transmitter with mounting bracket (2 shackles, 4 nuts, 4 U-plates, 1 angle) 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**	✓	✓	✓
• FFPM (Kalrez, compound 4079)	**A22**	✓	✓	✓
• NBR (Buna N)	**A23**	✓	✓	✓
Plug				
• Han 7D (metal, gray)	**A30**	✓		
• Han 8U (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
Sealing screws (2 unit(s)) ¼-18 NPT, with valve in mat. of process flanges	**A40**	✓	✓	✓
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_2O and/or psi	**B21**	✓	✓	✓
Factory calibration certificate	**C11**	✓	✓	✓
Material traceability certificate	**C12**	✓	✓	✓
Factory certificate of conformance	**C14**	✓	✓	✓
SIL2 certificate per IEC 61508 / 61511	**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**	✓	✓	✓
Degree of protection IP68 (only for M20 x 1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Brad Harrison Connector	**D40**	✓	✓	✓
Use in or on zone 1D/2D (only together with type of protection "Intrinsic safety (EEx ia)")	**E01**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
Two coats of lacquer on casing and cover (PU on epoxy)	**G10**	✓	✓	✓
Interchanging of process connection side	**H01**	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines	**H03**	✓	✓	✓
Surge Protection				
External, ½" NPT	**J01**			
Manifold Mounting				
Assembled for 3-valve manifold 7MF9411-5BA-Z+K36, Chromized steel screws, PTFE-gaskets, and pressure test	**U01**			
Assembled for 3-valve manifold 7MF9411-5BA-Z+K46, Stainless steel screws, PTFE-gaskets, and pressure test	**U02**			
Assembled for 5-valve manifold 7MF9411-5CA-Z+K36, Chromized steel screws, PTFE-gaskets, and pressure test	**U03**			
Assembled for 5-valve manifold 7MF9411-5CA-Z+K46, Stainless steel screws, PTFE-gaskets, and pressure test	**U04**			
Additional data				
Please add "**-Z**" to Order No. and specify Order code(s) and plain text.				
Calibrated range Specify in plain text:				
• in the case of linear characteristic curve (max. 5 characters): Y01: X to Y psi, in$H_2$0, ft$H_2$0...	**Y01**	✓		
• in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	**Y02**	✓		
Tag number/Identification (max. 16 characters), specify in plain text: Y15:	**Y15**	✓	✓	✓
Tag description (max. 27 characters), specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART (TAG) (max. 8 characters), specify in plain text: Y17:	**Y17**	✓		
Pressure units for digital display specify in plain text: Y21: psi, in$H_2$0, ft$H_2$0 ...	**Y21**	✓	✓	✓
Pressure units for digital display				
Non-Pressure units for digital display[1] (measuring range in pressure units ("Y01"/"Y02") mandatory) Specify in plain text: Y22: .X to Y GPM, MGD, Feet ...	**Y22 + Y01** *or* **Y02**	✓		
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	**Y25**		✓	

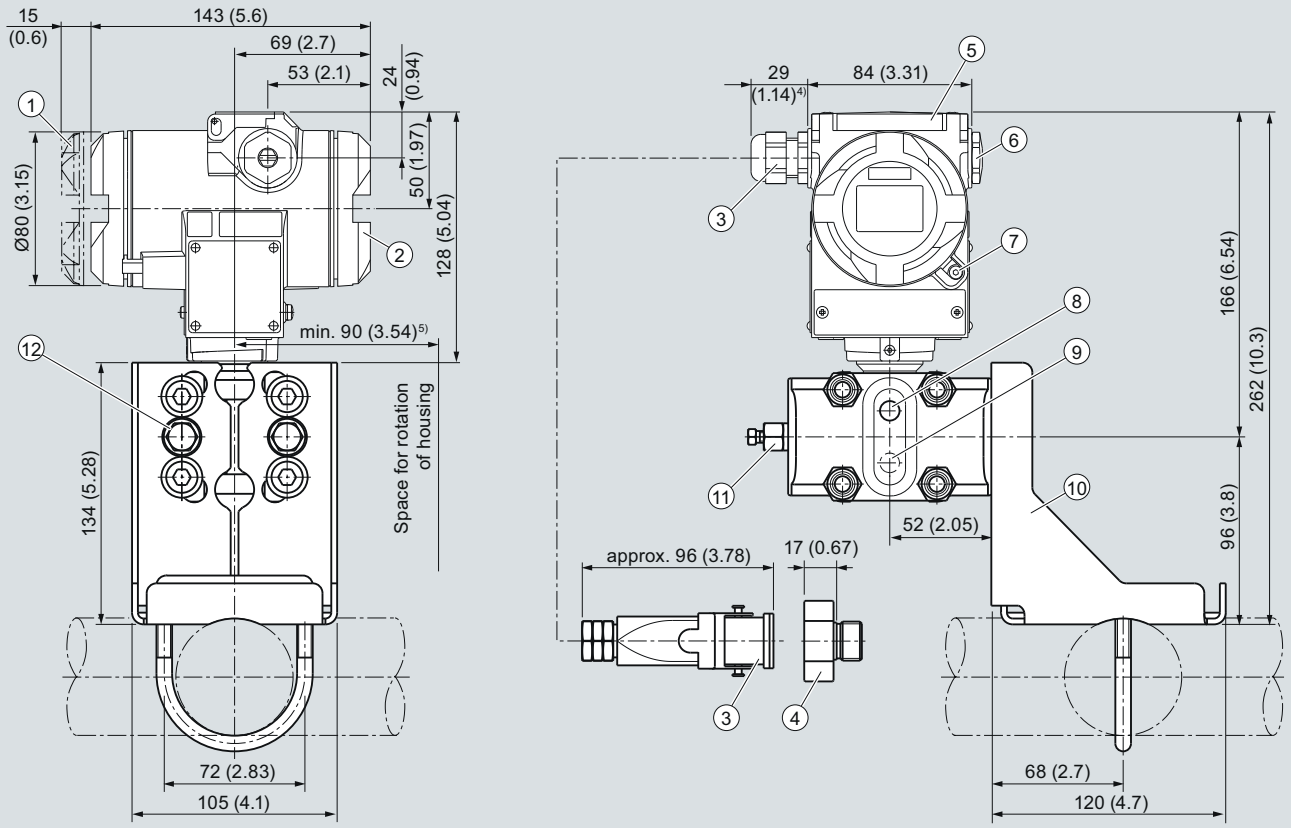
Factory mounting of valve manifolds, see accessories.

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

✓ = available

[1] Preset values can only be changed over SIMATIC PDM.

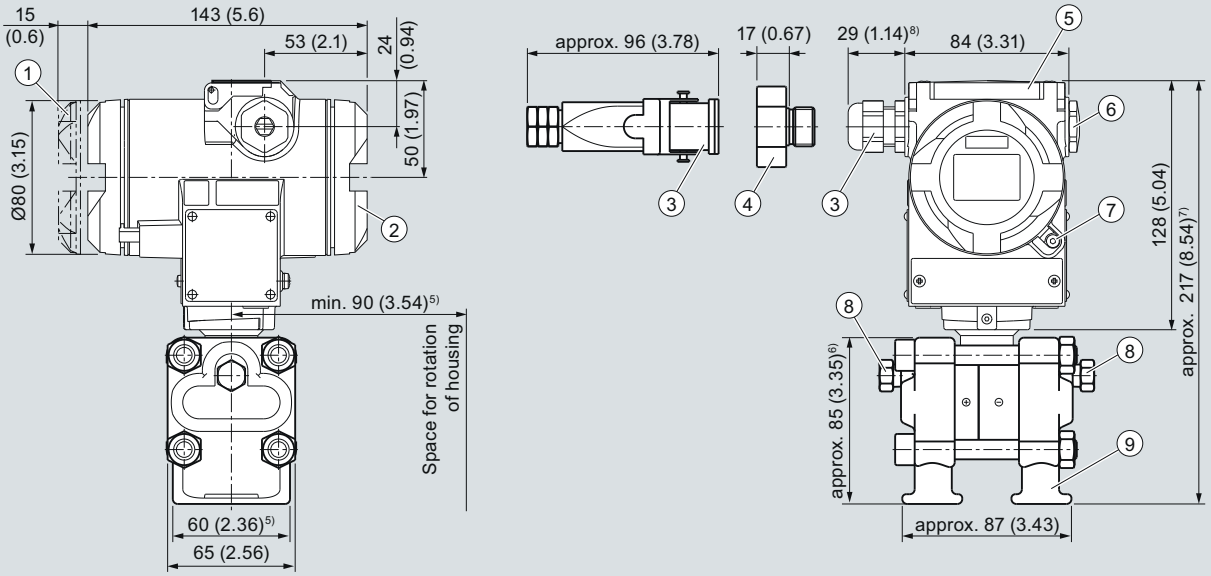
Dimensional drawings



1. Electronic side, digital display (longer overall length for cover with window)[1]
2. Terminal side[1]
3. Electrical connection: Screwed gland Pg 13,5 (adapter)(Adapter)[2] [3], Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/ Han 8D[2] [3] plug
4. Harting adapter
5. Protective cover over keys
6. Blanking plug
7. Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
8. Lateral venting for liquid measurement (Standard)
9. Lateral venting for gas measurement (suffix H02)
10. Mounting bracket (option)
11. Sealing screw with valve (option)
12. Process connection: ¼-18 NPT (IEC 61518)

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) For Pg 13,5 with adapter approx. 45 mm (1.77 inch)

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



1. Electronic side, digital display (longer overall length for cover with window)[1)]
2. Terminal side[1)]
3. Electrical connection: Screwed gland Pg 13,5 (adapter)(Adapter)[2) 3)], Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/ Han 8D[2) 3)] plug
4. Harting adapter
5. Protective cover over keys
6. Blanking plug
7. Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
8. Sealing screw with valve (option)
9. Process connection: ¼-18 NPT (IEC 61518)

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 (MAWP ≥ 6092 psi)
6) 91 mm (3.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
7) 219 mm (8.62 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
8) For Pg 13,5 with adapter approx. 45 mm (1.77 inch)

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

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

Technical specifications

SITRANS P DS III for level	HART		PROFIBUS PA or FOUNDATION Fieldbus	
Input				
Measured variable	Level			
Spans (infinitely adjustable) or nominal measuring range and max. permissible operating pressure	Span (min. ... max.)	Maximum operating pressure	Nominal measuring range	Maximum operating pressure
	10 ... 100 inH_2O (25 ... 250 mbar)	See "Mounting flange"	100 inH_2O (250 mbar)	See "Mounting flange"
	10 ... 240 inH_2O (25 ... 600 mbar)	See "Mounting flange"	240 inH_2O (600 mbar)	See "Mounting flange"
	21 ... 642 inH_2O (53 ... 1600 mbar)	See "Mounting flange"	642 inH_2O (1600 mbar)	See "Mounting flange"
	64 ... 2000 inH_2O (160 ... 5000 mbar)	See "Mounting flange"	2000 inH_2O (5000 mbar)	See "Mounting flange"
Lower measuring limit				
• Measuring cell with silicone oil filling	-100% of max. span or 0.44 psi a (30 mbar), depending on mounting flange			
Upper measuring limit	100 % of max. span		100 % of the max. nominal measuring range	
Output				
Output signal	4 ... 20 mA		Digital PROFIBUS PA and FOUNDATION Fieldbus signal	
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-	
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-	
Load				
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V		-	
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)		-	
Physical bus	-		IEC 61158-2	
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.			
Measuring accuracy	Acc. to IEC 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 at limit setting incl. hysteresis and reproducibility				
• Linear characteristic			≤ 0.15 %	
- r ≤ 10	≤ 0.15 %			
- 10 < r ≤ 30	≤ 0.3 %			
- 30 < r ≤ 100	≤ (0.0075 · r + 0.075) %			
Long-term stability (temperature change ± 30 °C (± 54 °F))	≤ (0.25 · r)% every 5 years static pressure max. 70 bar (1015 psi)		≤ 0.25 % every 5 years static pressure max. 70 bar (1015 psi)	
Influence of ambient temperature				
• at -10 ... +60 °C (14 ... 140 °F)				
- 100 inH_2O (250-mbar) measuring cell	≤ (0.5 · r + 0.2) %[1) 4)]		≤ 0.7 %	
- 240 inH_2O (600-mbar) measuring cell	≤ (0.3 · r + 0.2) %[2) 4)]		≤ 0.5 %	
- 642 and 2000 inH_2O (1600 and 5000 mbar) measuring cells	≤ (0.25 · r + 0.2) %[3) 4)]		≤ 0.45 %	
• at -40 ... -10 °C and 60 ... 85 °C (-40 ... +14 °F and 140 ... 185 °F)				
- 100 inH_2O (250-mbar) measuring cell	≤ (0.25 · r + 0.15) %/10 K doubled values at 10 < r ≤ 30		≤ 0.4 %/10 K	
- 240 inH_2O (600-mbar) measuring cell	≤ (0.15 · r + 0.15) %/10 K doubled values at 10 < r ≤ 30		≤ 0.3 %/10 K	
- 642 and 2000 inH_2O psi (1600 and 5000 mbar) measuring cells	≤ (0.12 · r + 0.15) %/10 K double values at 10 < r ≤ 30		≤ 0.27 %/10 K	

SITRANS P DS III for level	HART	PROFIBUS PA or FOUNDATION Fieldbus
Influence of static pressure		
• on the zero point		
- 100 inH_2O (250-mbar) measuring cell	≤ (0.3 · r) % per nominal pressure	≤ 0.3 % per nominal pressure
- 240 inH_2O (600-mbar) measuring cell	≤ (0.15 · r) % per nominal pressure	≤ 0.15 % per nominal pressure
- 642 and 2000 inH_2O (1600 and 5000 mbar) measuring cells	≤ (0.1 · r) % per nominal pressure	≤ 0.1 % per nominal pressure
• on the span	≤ (0.1 · r) % per nominal pressure	≤ 0.1 % per nominal pressure
Measured Value Resolution	-	3 · 10^{-5} of nominal measuring range
Rated conditions		
Degree of protection (to IEC 60529)	IP65, optional IP68	
Temperature of medium	**Note:** Always take into account assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection!	
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
- High-pressure side	p_{abs} ≥ 1 bar: -40 ... +175 °C (-40 ... +347 °F) p_{abs} < 1 bar: -40 ... +80 °C (-40 ... +176 °F)	
- Low-pressure side	-40 ... +100 °C (-40 ... +212 °F) -20 ... +60 °C (-4 ... +140 °F) in conjunction with dust explosion protection	
Ambient conditions		
• Ambient temperature		
- Digital indicator	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
• Electromagnetic Compatibility		
- Emitted interference and interference immunity	Acc. to EN 61326 and NAMUR NE 21	
Design		
Weight (without options)		
To EN (pressure transmitter with mounting flange, without tube)	≈ 11 ... 13 kg (≈ 24.2 ... 28.7 (lb)	
To ASME (pressure transmitter with mounting flange, without tube)	≈ 11 ... 18 kg (≈ 24.2 ... 39.7 lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AlSi12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
High-pressure side		
• Seal diaphragm of mounting flange	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, ETCFE	
Measuring cell filling	Silicone oil	
Process connection		
• High-pressure side	Flange to EN and ASME	
• Low-pressure side	Female thread ¼-18 NPT and flange connection with mounting thread M10 to DIN 19213 or $^{7}/_{16}$-20 UNF to IEC 61518	
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
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P DS III for level

SITRANS P DS III for level	HART	PROFIBUS PA or FOUNDATION Fieldbus
Certificates and approvals		
Classification according to PED 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	
- Marking	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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G 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	
- Marking	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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Marking	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	TÜV 01 ATEX 1696 X
- Marking	Ex II 3 G EEx nA L IIC T4/T5/T6	Ex II 3 G EEx nA L IIC T4/T5/T6
• Explosion protection acc. 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	

1) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.4 · r + 0.16) % / 28 °C (50 °F).
2) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.24 · r + 0.16) % / 28 °C (50 °F).
3) Conversion of temperature error per 28 °C. Valid for temperature range -3 ... +53 °C < (0.2 · r + 0.16) % / 28 °C (50 °F).
4) 0.32 instead of 0.16 at 10 < r < 30

HART communication	
HART	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	5 (one measured value) or 10 (two measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)
Internal preprocessing	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, Class B
Function blocks	2
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- Simulation function	Input/Output
- Failure mode	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	2
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Characterizer	Max. 30 points
- Square-rooted characteristic for flow measurement	Yes
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

FOUNDATION Fieldbus communication	
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure mode	parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
Mounting flange	
Nominal diameter	Nominal pressure
• Acc. to EN 1092-1	
- DN 80	PN 40
- DN100	PN16, PN40
• To ASME B16.5	
- 3 inch	Class 150, class 300
- 4 inch	Class 150, class 300

SITRANS P DS III for level

2

Selection and Ordering data		Order No. 7MF4633-
Pressure transmitter for level, SITRANS P DS III with HART		**7MF4633-** **Y** -
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	**1**
Measuring span (min. ... max.)		
10 ... 100 inH_2O	(25 ... 250 mbar)	**D**
10 ... 240 inH_2O	(25 ... 600 mbar)	**E**
22 ... 640 inH_2O	(53 ... 1600 mbar)	**F**
64 ... 2 000 inH_2O	(0.16 ... 5 bar)	**G**
Process connection of low-pressure side		
Female thread ¼-18 NPT with flange connection		
• Mounting thread $^7/_{16}$-20 UNF to IEC 61518		**2**
• Mounting thread M10 to DIN 19213 (only for replacement requirement)		**0**
Non-wetted parts materials		
process flange screws	Electronics housing	
Stainless steel	Die-cast aluminum	**2**
Stainless steel	Stainless steel precision casting[1]	**3**
Version		
• Standard versions		**1**
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)		**2**
Hazardous area rating		
• General purpose		**A**
• ATEX Hazardous approval		
- "Intrinsically safe (EEx ia)"		**B**
- "Explosion-proof (EExd)"[2]		**D**
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[3]		**P**
- use in zone 2		**E**
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[3]		**R**
• FM/CSA Hazardous approval		
- "Intrinsically Safe und explosion proof (is + xp)"[2]		**N** **C**
Electrical connection / cable entry		
• Screwed gland Pg 13.5[4]		**A**
• Screwed gland M20x1.5		**B**
• ½-14 NPT		**C**
• Han 7D plug (plastic housing) incl. mating connector[4]		**D**
• M12 connectors (metal)[5]		**F**

Selection and Ordering data	Order No. 7MF4633-
Pressure transmitter for level, SITRANS P DS III with HART	**7MF4633-** **Y** -
Indicator	
• Without indicator	**0**
• Without indicator (digital display hidden, setting: mA)	**1**
• With indicator (digital display visible, setting: mA)	**6**
• With indicator (digital display visible, settings as specified, Order Code "Y21"/"Y22" required)	**7**

Ordering information

1st order item: Pressure transmitter 7MF4633-...
2nd order item: Mounting flange 7MF4912-3...

Ordering example

Item line 1:	7MF4633-1DY22-1AC1-Z
B line:	Y01
C line:	Y01: 32 to 58 inH_2O (80 to 143 mbar)
Item line 2:	7MF4812-3QA01

Power supply units see Chap. 8 "Supplementary Components".

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 in conjunction 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 in conjunction with types of protection "Explosion-proof" and "Ex nA", "Intrinsic safety" and "Explosion-proof".

[5] M12 delivered without cable socket

Selection and Ordering data		Order No.
Pressure transmitters for level		
SITRANS P DS III with PROFIBUS PA (PA)		7MF4634-
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7MF4635-
		1 ■ Y ■■ - ■■■■
Nominal measuring range		
100 inH_2O	(250 mbar)	D
240 inH_2O	(600 mbar)	E
640 inH_2O	(1600 mbar)	F
2 000 inH_2O	(5 bar)	G
Process connection of low-pressure side		
Female thread ¼-18 NPT with flange connection		
• Mounting thread $^7/_{16}$-20 UNF to IEC 61518		2
• Mounting thread M10 to DIN 19213 (only for replacement requirement)		0
Non-wetted parts materials		
process flange screws	Electronics housing	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting	3
Version		
• Standard versions		1
• International version, English label inscriptions, documentation in 5 languages on CD (no order code selectable)		2
Hazardous area rating		
• General purpose		A
• ATEX Hazardous approval		
- "Intrinsically safe (EEx ia)"		B
- "Explosion-proof (EExd)"[1]		D
- "Intrinsically safe and explosion-proof (EEx ia + EEx d)"[2]		P
- use in zone 2		E
- "Intrinsically safe, explosion-proof enclosure and dust explosion protection (EEx ia + EEx d + zone 1D/2D)"[2]		R
• FM/CSA Hazardous approval		
- "Intrinsically Safe und explosion proof (is + xp)"[1]		N C
Electrical connection / cable entry		
• Screwed gland M20 x 1.5		B
• ½-14 NPT		C
• M12 connectors (metal)[3]		F
Indicator		
• Without indicator		0
• Without indicator (digital display hidden, setting: mA)		1
• With indicator (digital display visible, setting: mA)		6
• With indicator (digital display visible, settings as specified, Order Code "Y21"" 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) M12 delivered without cable socket

SITRANS P DS III for level

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
O-rings for process flanges on low-pressure side (instead of FPM (Viton))				
• PTFE (Teflon)	**A20**	✓	✓	✓
• FEP (with silicone core, approved for food)	**A21**	✓	✓	✓
• FFPM (Kalrez, compound 4079)	**A22**	✓	✓	✓
• NBR (Buna N)	**A23**	✓	✓	✓
Plug				
• Han 7D (metal, gray)	**A30**	✓		
• Han 8U (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
Sealing screw ¼-18 NPT, with valve in mat. of process flanges	**A40**	✓	✓	✓
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_20 and/or psi	**B21**	✓	✓	✓
Factory calibration certificate	**C11**	✓	✓	✓
Material traceability certificate	**C12**	✓	✓	✓
Factory certificate of conformance	**C14**	✓	✓	✓
SIL2 certificate per IEC 61508 / 61511	**C20**	✓		
PROFIsafe certificate and protocol	**C21**		✓	
Setting of upper limit of output signal to 22.0 mA	**D05**	✓		
Degree of protection IP68 (only for M20x1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Supplied with oval flange (1 item), PTFE packing and screws in thread of process flange	**D37**	✓	✓	✓
Brad Harrison Connector	**D40**	✓	✓	✓
Use on zone 1D / 2D (only together with type of protection "Intrinsic safety (EEx ia)")	**E01**	✓	✓	✓
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**	✓	✓	
Two coats of lacquer on casing and cover (PU on epoxy)	**G10**	✓	✓	✓
Replacement of process connection side	**H01**	✓	✓	✓
Surge Protection				
External, ½" NPT	**J01**	✓		

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
Additional data				
Please add "**-Z**" to Order No. and specify Order code(s) and plain text.				
Calibrated range Specify in plain text (max. 5 characters): Y01: X to Y psi, inH_20, ftH_20...	**Y01**	✓		
Tag number/Identification (max. 16 characters), specify in plain text: Y15:	**Y15**	✓	✓	✓
Tag description (max. 27 characters), specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART (TAG) (max. 8 characters), specify in plain text: Y17:	**Y17**	✓		
Pressure units for digital display specify in plain text: Y21: psi, inH_20, ftH_20 ...	**Y21**	✓	✓	✓
Pressure units for digital display				
Non-Pressure units for digital display[2] (measuring range in pressure units("Y01"/"Y02") mandatory) specify in plain text: Y22: X to Y GPM, MGD, Feet ...	**Y22**[1] **+ Y01**	✓		
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 in conjunction with over-filling safety device for flammable and non-flammable liquids (Order Code "E08")

[2] Preset values can only be changed over SIMATIC PDM.

Selection and Ordering data		Order No.
Mounting flange	D)	7 M F 4 8 1 2 -
Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series		3 ■ ■ ■ ■ ■ ■ ■
Connection to EN 1092-1		
Nominal diameter	**Nominal pressure**	
DN 80	PN 40	D
DN 100	PN 16	G
	PN 40	H
Connection to ASME B16.5		
Nominal diameter	**Nominal pressure**	
3 inch	Class 150	Q
	Class 300	R
4 inch	Class 150	T
	Class 300	U
Other version, add Order Code and plain text: Nominal diameter: ...; Nominal press.: ...		Z J 1 Y
Wetted parts materials		
• Stainless steel 316L		A
- Coated with PFA		D
- Coated with PTFE		E 0
• Coated with ECTFE[1]		F
• Monel 400, mat. no. 2.4360		G
• Hastelloy B2, mat. no. 2.4617		H
• Hastelloy C276, mat. no. 2.4819		J
• Hastelloy C4, mat. no. 2.4610		U
• Tantalum		K
Other version, add Order Code and plain text: material of parts in contact with the medium: ... Sealing face, see "Technical specifications"		Z K 1 Y
Tube length		
• None		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-measurement)		4
• Glycerin/water[2]		6
• Food oil (FDA-listed)		7
Other version, add Order Code and plain text: filling liquid: ...		9 M 1 Y

[1] For vacuum on request

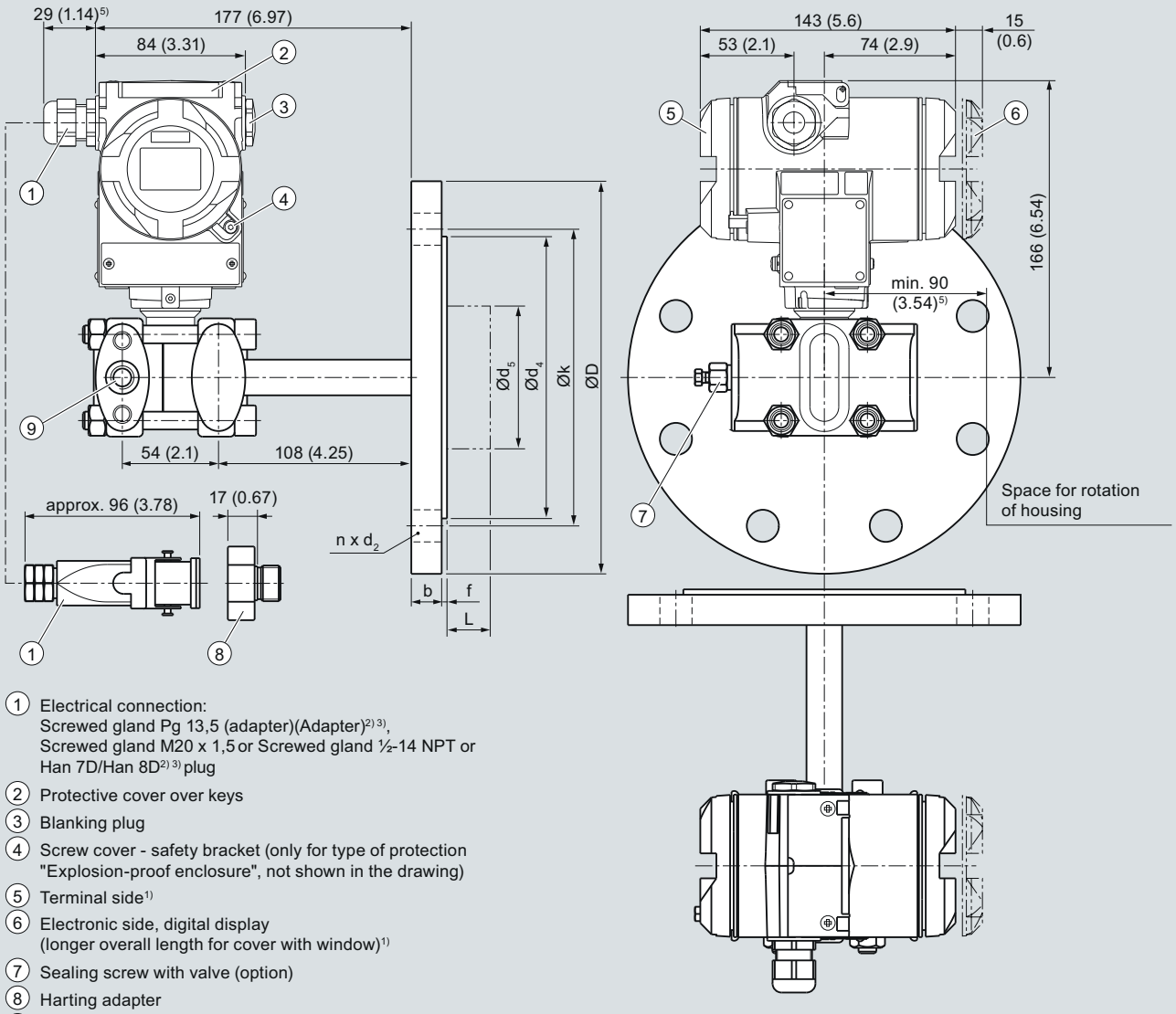
[2] Not suitable for use in low-pressure range

D) Subject to export regulations AL:N, ECCN:EAR99H

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Order No. and specify Order Code.				
Spark arrester For mounting on zone 0 (including documentation)	**A01**	✓	✓	
Certificate to EN 10204-2.2 For certification of oil - and grease-free cleaned and packed version for oxygen and summer applications in which only inert filling liquid may be used. (Only in conjunction with halocarbon oil fill fluid)	**C10**			
Factory calibration certificate	**C11**	✓	✓	
Material traceability certificate	**C12**	✓	✓	
Vacuum-proof design (for use in low-pressure range) Note: suffix "Y01" required with pressure transmitter!	**V04**	✓	✓	

✓ = available

Dimensional drawings



1. Electrical connection:
   Screwed gland Pg 13,5 (adapter)(Adapter)[2) 3)],
   Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or
   Han 7D/Han 8D[2) 3)] plug
2. Protective cover over keys
3. Blanking plug
4. Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
5. Terminal side[1)]
6. Electronic side, digital display
   (longer overall length for cover with window)[1)]
7. Sealing screw with valve (option)
8. Harting adapter
9. Process connection of low pressure side ¼-18 NPT (IEC 61518)

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) For Pg 13,5 with adapter approx. 45 mm (1.77 inch)

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

Connection to EN 1092-1

Nominal diameter	Nominal pressure	L	D	h	d_2	d_4	d_5	d_M	j	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

Nominal diameter	Nominal pressure	L	D	d_2	d_4	d_5	d_M	j	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)		mm (inch)
3 inch	150	0.94 (24.3)	7.5 (190)	0.75 (19.0)	5 (127)	3 (76)	2.81[1)] (72)	0.06 (2)	6 (152,4)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	1.12 (29)	8.25 (210)	0.87 (22.2)	5 (127)	3 (76)	2.81[1)] (72)	0.06 (2)	6.69 (168,3)	8	
4 inch	150	0.94 (24.3)	9 (230)	0.75 (19.0)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.06 (2)	7.5 (190,5)	8	
	300	1.25 (32.2)	10 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.06 (2)	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.

Selection and Ordering data		Order No.
Replacement measuring cell for pressure for SITRANS P DS III		**7MF4990 - 0 - 0DB0**
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	Normal	1
Inert liquid	Grease-free to cleanliness level 2	3
Measured span (min. ... max.)		
0.15 ... 14.5 psi	(0.01 ... 1 bar)	B
0.6 ... 58 psi	(0.04 ... 4 bar)	C
2.32 ... 232 psi	(0.16 ... 16 bar)	D
9.14 ... 914 psi	(0.63 ... 63 bar)	E
23.2 ... 2320 psi	(1.6 ... 160 bar)	F
58.0 ... 5802 psi	(4.0 ... 400 bar)	G
102.0 ... 10153 psi	(7.0 ... 700 bar)	J
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Process connection		
• Connection shank G½B to EN 837-1		0
• Female thread ½-14 NPT		1
• Oval flange made of stainless steel, max. span 160 bar (2320 psi)		
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518		2
- Mounting thread M10 to DIN 19213		3
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code.		
Material traceability certificate		**C12**

Selection and Ordering data		Order No.
Replacement measuring cell for absolute pressure for SITRANS P DS III (gauge construction) F)		**7MF4992 - 0 - 0DC0**
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	Normal	1
Inert liquid	Grease-free to cleanliness level 2	3
Measured span (min ... max.)		
0.12 ... 3.63 psia	(8.3 ... 250 mbar a)	D
0.62 ... 18.9 psia	(43 ... 1300 mbar a)	F
2.32 ... 72.5 psia	(0.16 ... 5 bar a)	G
14.5 ... 435 psia	(1 ... 30 bar a)	H
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Process connection		
• Connection shank G½B to EN 837-1		0
• Female thread ½-14 NPT		1
• Oval flange made of stainless steel, max. span 160 bar (2320 psi)		
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518		2
- Mounting thread M10 to DIN 19213		3
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code.		
Material traceability certificate		**C12**

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

Selection and Ordering data			Order No.
Spare parts / Accessories			
Replacement measuring cell for absolute pressure for SITRANS P DS III (differential construction)		F)	**7MF4993 - ■■■■■ - 0DC0**
Measuring cell filling	**Measuring cell cleaning**		
Silicone oil	Normal		**1**
Inert liquid	Grease-free to cleanliness level 2		**3**
Measured span (min. ... max.)			
0.12 ... 3.63 psi a	(8.3 ... 250 mbar a)	E)	**D**
0.62 ... 18.9 psi a	(43 ... 1300 mbar a)	E)	**F**
2.32 ... 72.5 psi a	(0.16 ... 5 bar a)	E)	**G**
14.5 ... 435 psi a	(1 ... 30 bar a)		**H**
76.9 ... 1450 psi a	(5.3 ... 100 bar a)		**K**
Wetted parts materials			**E**
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**
Process connection			
Female thread ¼-18 NPT with flange connection			
• Sealing screw opposite process connection			
- Mounting thread M10 to DIN 19213			**0**
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518			**2**
• Vent on side of process flange[1]			
- Mounting thread M10 to DIN 19213			**4**
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518			**6**
Non-wetted parts materials			
• Stainless steel process flange screws			**2**
Further designs			Order code
Please add "**-Z**" to Order No. and specify Order code.			
O-rings for process flanges			
(instead of FPM (Viton))			
• PTFE (Teflon)			**A20**
• FEP (with silicone core, approved for food)			**A21**
• FFPM (Kalrez, compound 4079)			**A22**
• NBR (Buna N)			**A23**
Material traceability certificate			**C12**
Process connection G½B			**D16**
Remote seal flanges (not together with K01, K02 and K04)			**D20**
Vent on side for gas measurements			**H02**
Process flanges			
• without			**K00**
• with process flange made of			
- Hastelloy			**K01**
- Monel			**K02**
- Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi) max. temperature of medium 90 °C (194 °F) For ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible			**K04**

1) Not for span "5.3 ... 100 bar (76.9 ... 1450 psi)"

E) Subject to the export regulations AL: 2B230, ECCN: N.

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

Selection and Ordering data		Order No.
Spare parts / Accessories		
Replacement measuring cell for differential pressure and PN 32/160 (MAWP 464/2320 psi) for SITRANS P DS III		**7MF4994 - ■■■■■ - 0DC0**
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	Normal	**1**
Inert liquid	Grease-free to cleanliness level 2	**3**
Measured span (min. ... max.)		
PN 32 (MAWP 464 psi)		
0.4 ... 8 inH_2O[1]	(1 ... 20 mbar)	**B**
PN 160 (MAWP 2320 psi)		
0.4 ... 24 inH_2O	(1 ... 60 mbar)	**C**
1 ... 100 inH_2O	(2.5 ... 250 mbar)	**D**
2.4 ... 240 inH_2O	(6 ... 600 mbar)	**E**
16.4 ... 642 inH_2O	(6 ... 1600 mbar)	**F**
20 ... 2000 inH_2O	(50 ... 5000 mbar)	**G**
4.35 ... 435 psi	(0.3 ... 30 bar)	**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[2]	Tantalum	**E**
Monel[2]	Monel	**H**
Gold[2]	Gold	**L**
Process connection		
Female thread ¼-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread M10 to DIN 19213		**0**
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518		**2**
• Vent on side of process flange		
- Mounting thread M10 to DIN 19213		**4**
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518		**6**
Non-wetted parts materials		
Stainless steel process flange screws		**2**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code.		
O-rings for process flanges		
(instead of FPM (Viton))		
• PTFE (Teflon)		**A20**
• FEP (with silicone core, approved for food)		**A21**
• FFPM (Kalrez, compound 4079)		**A22**
• NBR (Buna N)		**A23**
Material traceability certificate		**C12**
Remote seal flanges (not together with K01, K02 and K04)		**D20**
Vent on side for gas measurements		**H02**
Stainless steel process flanges for vertical differential pressure lines (not together with K01, K02 and K04)		**H03**
Process flanges		
• without		**K00**
• with process flange made of		
- Hastelloy		**K01**
- Monel		**K02**
- Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi) max. temperature of medium 90 °C (194 °F)For ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible		**K04**

1) Not suitable for connection of remote seal

2) Only together with max. spans 250, 1600, 5000 and 30000 mbar (100 inH_2O, 642 in H_2O, 2000 in H_2O and 435 psi).

SITRANS P DS III
Accessories/Spare Parts

Selection and Ordering data		Order No.
Spare parts / Accessories		
Replacement measuring cell for differential pressure and PN 420 (MAWP 6092 psi) for SITRANS P DS III		**7MF4995-** ■■■■■ **-0DC0**
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	Normal	**1**
Measured span (min. ... max.)		
1 ... 100 inH_2O	(2.5 ... 250 mbar)	**D**
2.4 ... 240 inH_2O	(6 ... 600 mbar)	**E**
6.4 ... 642 inH_2O	(16 ... 1600 mbar)	**F**
20 ... 2000 inH_2O	(50 ... 5000 mbar)	**G**
4.35 ... 435 psi	(0.3 ... 30 bar)	**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 ¼-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread M12 to DIN 19213		**1**
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518		**3**
• Vent on side of process flange		
- Mounting thread M12 to DIN 19213		**5**
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518		**7**
Non-wetted parts materials		
• Stainless steel process flange screws		**2**
Further designs		Order code
Please add "**-Z**" to Order No. and specify Order code.		
O-rings for process flanges (instead of FPM (Viton))		
• PTFE (Teflon)		**A20**
• FEP (with silicone core, approved for food)		**A21**
• FFPM (Kalrez, compound 4079)		**A22**
• NBR (Buna N)		**A23**
Material traceability certificate		**C12**
Stainless steel process flanges for vertical differential pressure lines		**H03**
without process flanges		**K00**

1) Not together with max. span 600 mbar (240.9 inH_2O)

Selection and Odering data		Order No.
Spare parts / Accessories		
Mounting bracket and fastening parts For pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF403.-.....-..C.) For absolute pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF423.-.....-..C.)		
• made of steel		**7MF4997-1AB**
• made of stainless steel		**7MF4997-1AH**
Mounting bracket and fastening parts For pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF403-.....-..A., -..B., ..D. and ..F.) For absolute pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF423-.....-..A., -..B., ..D. and ..F.)		
• made of steel		**7MF4997-1AC**
• made of stainless steel		**7MF4997-1AJ**
Mounting and fastening brackets For differential pressure transmitters with flange thread M10 SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF433.-... and 7MF443.-...)		
• made of steel		**7MF4997-1AD**
• made of stainless steel		**7MF4997-1AK**
Mounting and fastening brackets For differential pressure transmitters with flange thread M12 SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF453.-...)		
• made of steel		**7MF4997-1AE**
• made of stainless steel		**7MF4997-1AL**
Mounting and fastening brackets For differential and absolute pressure transmitters with flange thread 7/16 -20 UNF SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF433.-..., 7MF443.-... and 7MF453.-...)		
• made of steel		**7MF4997-1AF**
• made of stainless steel		**7MF4997-1AM**
Cover made of die-cast aluminum, including gasket, for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus		
• without window	F)	**7MF4997-1BB**
• with window	F)	**7MF4997-1BE**
Cover made of stainless steel, including gasket, for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus		
• without window	F)	**7MF4997-1BC**
• with window	F)	**7MF4997-1BF**

Selection and Odering data		Order No.
Digital indicator Including mounting material for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus		**7MF4997-1BR**
Measuring point label		
• without inscription (5 units)		**7MF4997-1CA**
• Printed (1 unit) Data according to Y01 or Y02, Y15 and Y16 (see "Pressure transmitters")		**7MF4997-1CB-Z** **Y..: .....**
Mounting screws For measuring point label, grounding and connection terminals or for digital indicator (50 units)		**7MF4997-1CD**
Sealing screws (1 set = 2 units) for process flange		
• made of stainless steel		**7MF4997-1CG**
• made of Hastelloy		**7MF4997-1CH**
Sealing screws with vent valve Complete (1 set = 2 units)		
• made of stainless steel		**7MF4997-1CP**
• made of Hastelloy		**7MF4997-1CQ**
Electronics		
• for SITRANS P DS III with HART		**7MF4997-1DK**
• for SITRANS P DS III with PROFIBUS PA		**7MF4997-1DL**
• for SITRANS P DS III with FOUNDATION Fieldbus		**7MF4997-1DM**
Connection board		
• for SITRANS P DS III		**7MF4997-1DN**
• for SITRANS P DS III PROFIBUS PA and FOUNDATION Fieldbus		**7MF4997-1DP**
O-rings for process flanges made of:		
• FPM (Viton)	F)	**7MF4997-2DA**
• PTFE (Teflon)	F)	**7MF4997-2DB**
• FEP (with silicone core, approved for food)	F)	**7MF4997-2DC**
• FFPM (Kalrez, compound 4079)	F)	**7MF4997-2DD**
• NBR (Buna N)	F)	**7MF4997-2DE**
Sealing ring for process connection		**see "Fittings"**
Weldable sockets for PMC connection		
• PMC Style Standard: Thread 1½"		**7MF4997-2HA**
• PMC Style Minibolt: front-flush 1"		**7MF4997-2HB**
Gaskets for PMC connection (packing unit = 5 units)		
• PTFE seal for PMC Style Standard: Thread 1½"	F)	**7MF4997-2HC**
• Gasket made of Viton for PMC Style Minibolt: front-flush 1"	F)	**7MF4997-2HD**
Weldable socket for TG52/50 and TG52/150 connection		
• TG52/50 connection		**7MF4997-2HE**
• TG52/150 connection		**7MF4997-2HF**
Seals for TG 52/50 and TG 52/150 made of silicone		**7MF4997-2HG**
Seals for flange connection with front-flush diaphragm Material FPM (Viton), 10 units		
• DN 25, PN 40 (M11)	F)	**7MF4997-2HH**
• DN 25, PN 100 (M21)	F)	**7MF4997-2HJ**
• 1", class 150 (M40)	F)	**7MF4997-2HK**
• 1", class 300 (M45)	F)	**7MF4997-2HL**

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

SITRANS P DS III
Accessories/Spare Parts

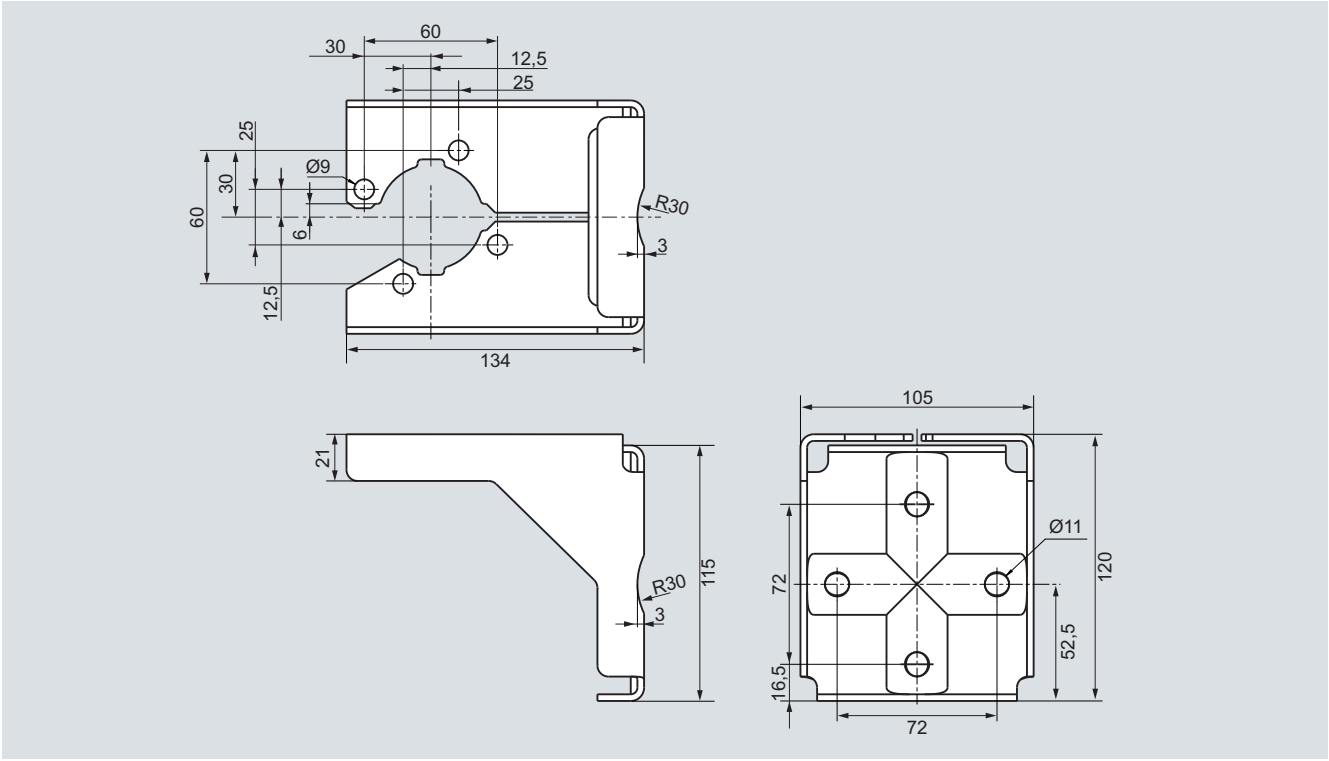
Selection and Odering data		Order No.
Operating Instructions[1]		
• for SITRANS P DS III with HART		
- German		**A5E00047090**
- English		**A5E00047092**
- French		**A5E00053218**
- Spanish		**A5E00053219**
- Italian		**A5E00053220**
• for SITRANS P DS III with PROFIBUS PA		
- German		**A5E00053275**
- English		**A5E00053276**
- French		**A5E00053277**
- Spanish		**A5E00053278**
- Italian		**A5E00053279**
• for SITRANS P DS III with FOUNDATION Fieldbus		
- German		**A5E00279629**
- English		**A5E00279627**
- French (planned)		**A5E00279630**
- Spanish (planned)		**A5E00279632**
- Italian (planned)		**A5E00279631**
Brief instructions (Leporello)		
• for SITRANS P DS III with HART		**A5E00047093**
- German, English		
• for SITRANS P DS III with PROFIBUS PA		**A5E00053274**
- German, English		
• for SITRANS P DS III with FOUNDATION Fieldbus		**A5E00282355**
- German, English		
CD with documentation for SITRANS P, P300 series, SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus series		
• German, English, French, Spanish, Italian		**A5E00090345**
Certificates (order only via SAP)		
instead of Internet download		
• hard copy (to order)		**A5E03252406**
• on CD (to order)		**A5E03252407**
Operating Instructions for replacement of electronics, measuring cell and connection board (only available from the Internet)[1]		**A5E00078060**
HART modem		
• with RS232 interface	D)	**7MF4997-1DA**
• with USB interface	D)	**7MF4997-1DB**

Power supply units see Chap. 8 "Supplementary Components".

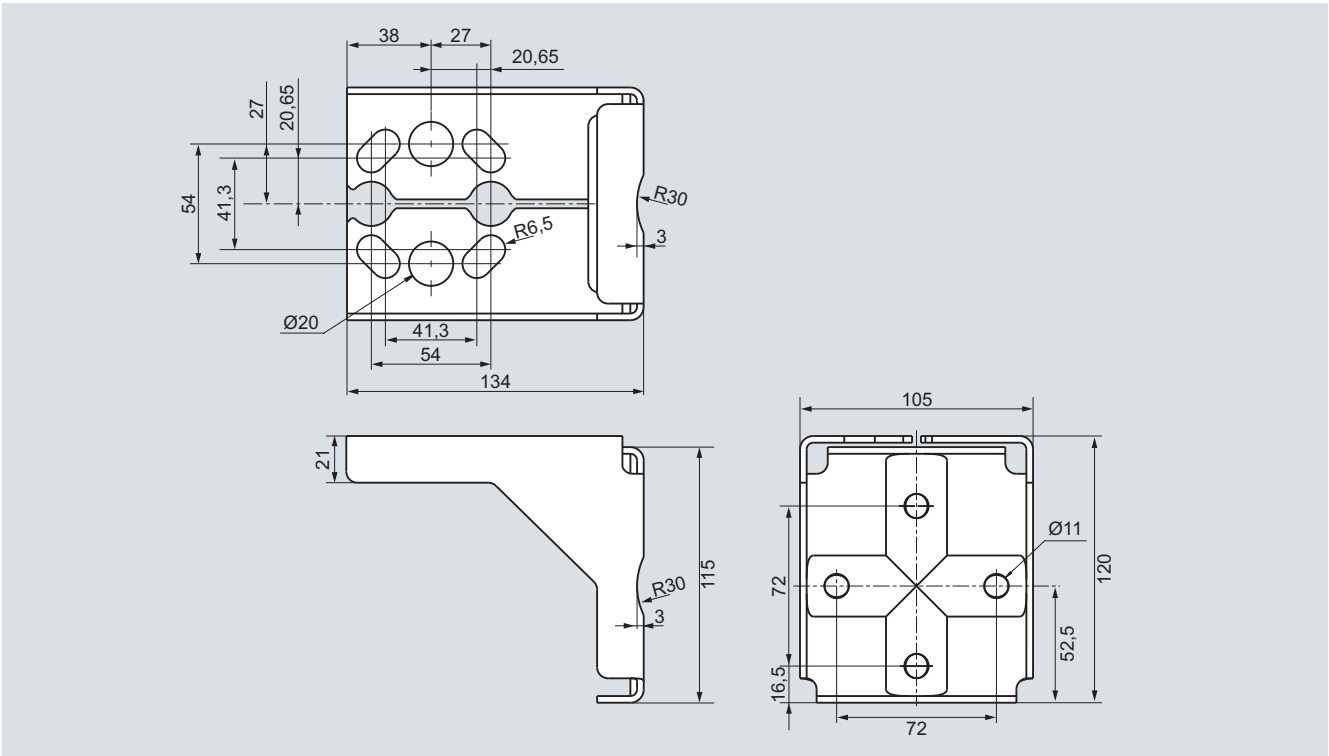
1) You can download these operating instructions free-of-charge from our Internet site at www.siemens.de/sitransp.

D) Subject to export regulations AL: N, ECCN: EAR99H.

Dimensional drawings



Mounting bracket for SITRANS P DS III and SITRANS P280 gauge and absolute pressure-transmitters, dimensions in mm
mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)



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

SITRANS P DS III - Factory-mounting of valve manifolds on transmitters

Overview

SITRANS P transmitters

- DS III for relative and absolute pressure (both designs) and
- DS III for differential pressure

can be delivered factory-fitted with the following valve manifolds:

- 7MF9011-4FA valve manifolds for gauge pressure and absolute pressure transmitters
- 7MF9411-5BA and 7MF9411-5CA valve manifolds for absolute pressure and differential pressure transmitters

Design

The 7MF9011-4FA valve manifolds are sealed with PTFE sealing tape between the transmitter and the valve manifold.

The 7MF9411-5BA and 7MF9411-5CA valve manifolds are sealed with PTFE sealing rings between the transmitter and the valve manifold.

Once installed, the complete unit is checked under pressure for leaks (compressed air 6 bar(87 psi))and is certified leak-proof with a test report to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the respective mounting brackets. The transmitters are mounted on the valve manifold and not on the unit itself.

If you order a mounting bracket when choosing the option "Factory mounting of valve manifolds", you will receive a mounting bracket for the valve manifold instead of a bracket for mounting the transmitter.

If you order an acceptance test certificate 3.1 to EN10204 when choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitters and the valve manifolds respectively.

Selection and Ordering data

7MF9011-4FA
valve manifold on relative and absolute pressure transmitters

Add **-Z** to the Order No. of the transmitter and add order codes	Order code
SITRANS P DSIII 7MF403.-...1.-..., 7MF423.-...1.-... With process connection female thread ½-14 NPT in-sealed with PTFE sealing tape Delivery incl. high-pressure test certified by test report to EN10204-2.2	**T03**
Further designs:	
Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)	**A02**
Material traceability certificate	**C12**

7MF9011-4EA
valve manifold on relative and absolute pressure transmitters

Add **-Z** to the Order No. of the transmitter and add order codes	Order code
SITRANS P DSIII 7MF403.-...0.-..., 7MF423.-...0.-... with process connection collar G1/2 A to EN 837-1 with gasket made of PTFE between valve manifold and transmitter	**T02**
Alternative sealing material:	
• Soft iron	**A70**
• Stainless steel, Mat. No. 14571	**A71**
• copper	**A72**
Delivery incl. high-pressure test certified by test report to EN 10204-2.2	
Further designs:	
Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)	**A02**
Material traceability certificate	**C12**

7MF9411-5BA
valve manifold on absolute and differential pressure transmitters

Add **-Z** to the Order No. of the transmitter and add order codes	Order code
SITRANS P DSIII 7MF433.-…, 7MF443.-… and 7MF453.-… [1] mounted with gaskets made of PTFE and screws made of	
• chromized steel	**U01**
• made of stainless steel	**U02**
Delivery incl. high-pressure test certified by test report to EN 10204-2.2	
Further designs:	
Delivery includes mounting bracket and mounting clips made of	
• Steel	**A01**
• Stainless steel	**A02**
(instead of the mounting bracket supplied with the transmitter)	
Material traceability certificate	**C12**

7MF9411-5CA
valve manifold on differential pressure transmitters

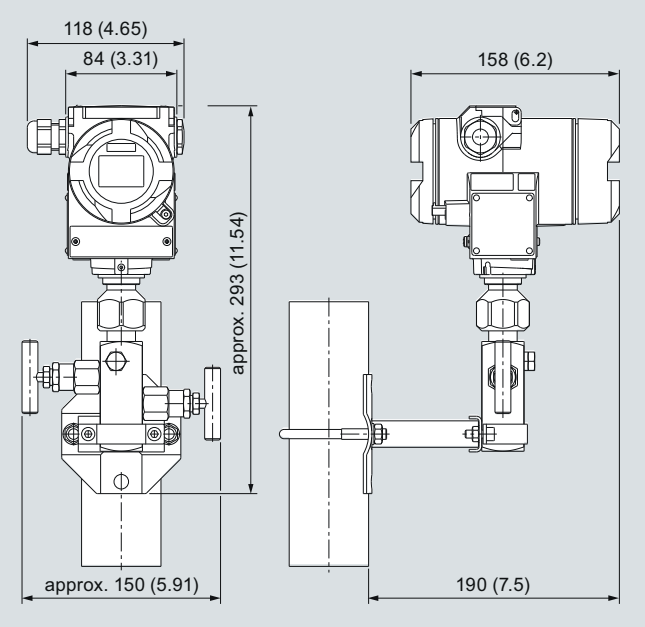
Add **-Z** to the Order No. of the transmitter and add order codes	Order code
SITRANS P DSIII 7MF443.-... and 7MF453.-…1 [1] mounted with gaskets made of PTFE and screws made of	
• chromized steel	**U03**
• Stainless steel	**U04**
Delivery incl. high-pressure test certified by test report to EN 10204-2.2	
Further designs:	
Delivery includes mounting bracket and mounting clips made of	
• Steel	**A01**
• Stainless steel	**A02**
(instead of the mounting bracket supplied with the transmitter)	
Material traceability certificate	**C12**

[1] For 7MF453.-... transmitters, you require a 7/10-20 UNF connection thread in the process flange

Dimensional drawings

Valve manifold mounted on SITRANS P DS III

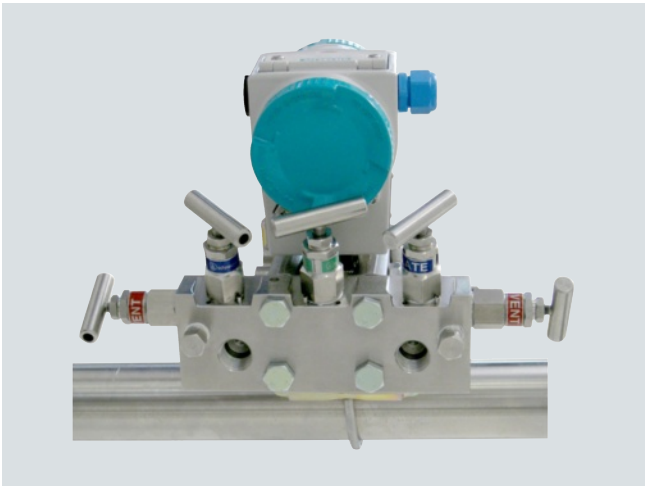
7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters



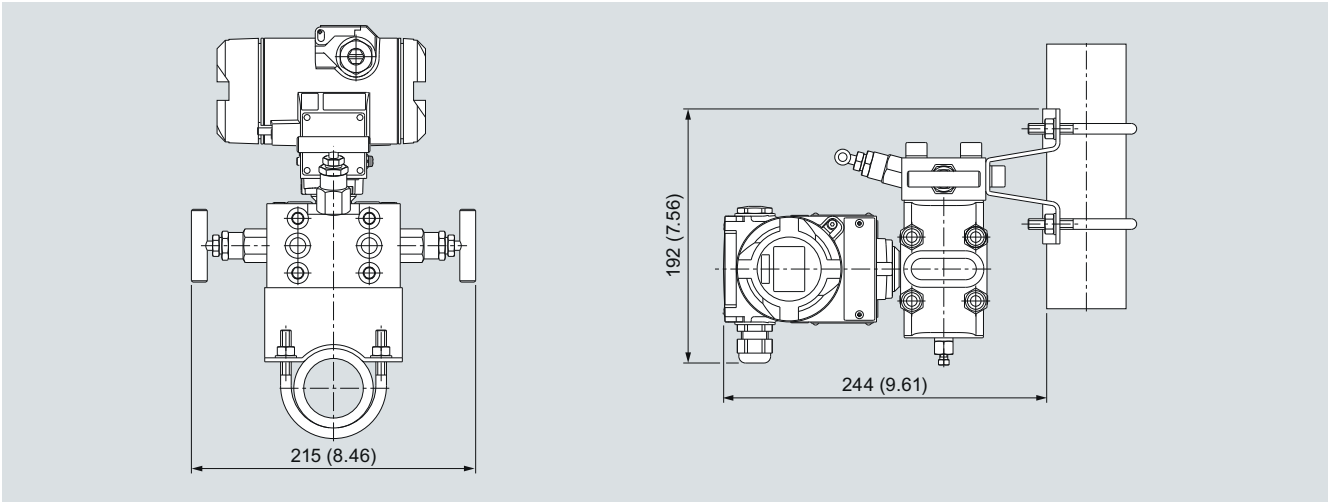
7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)

SITRANS P DS III - Factory-mounting of valve manifolds on transmitters

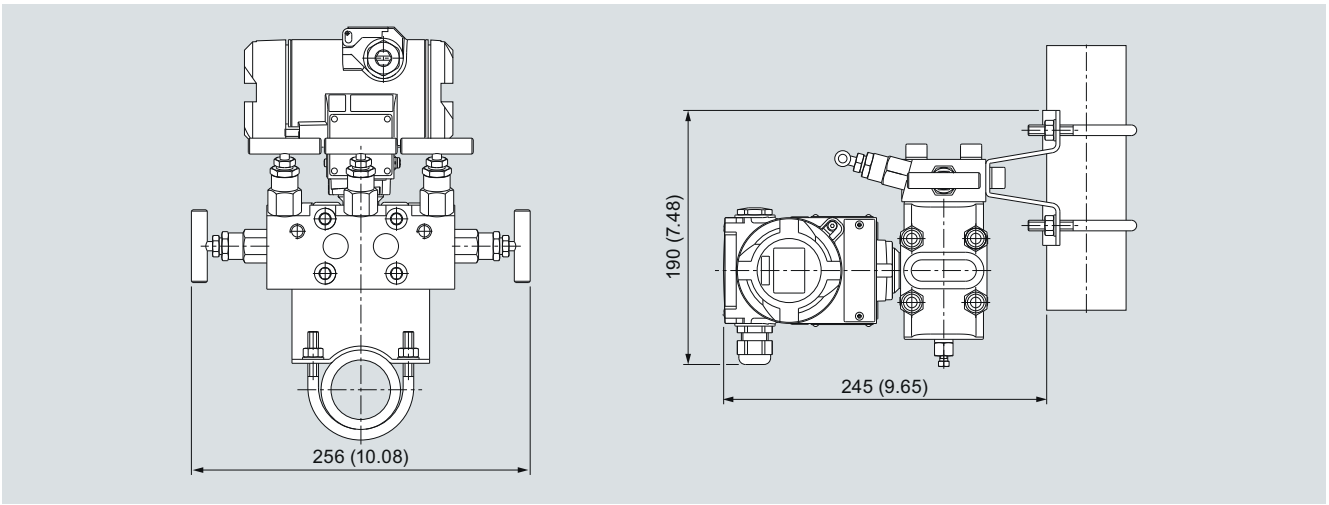
7MF9411-5BA valve manifold with mounted differential pressure transmitter



7MF9411-5CA valve manifold with mounted differential pressure transmitter



7MF9411-5BA valve manifold with mounted differential pressure transmitter, dimensions in mm (Inch)



7MF9411-5CA valve manifold with mounted differential pressure transmitter, dimensions in mm (Inch)

Overview

SITRANS P500 pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and which fulfil the most stringent demands of accuracy, long-term stability, speed and lots more.

Extensive functionality allows you to set the pressure transmitter specifically to your own requirements. Despite their many settings options, local set-up is easy. A multi-lingual menu with clear text instructions guides you through the process. There are also help texts available.

The innovative EDD with integrated QuickStart assistance is also quick and easy to configure by computer using the HART protocol.

Extensive diagnostic functions, e.g. min/max pointer for pressure and temperature, or limit value indicator, make sure you always have the process under control. You can also display additional process values such as temperature or static pressure. The simultaneous display of mass, resulting from a volume, is also easy.

The SITRANS P500 pressure transmitters can be configured to measure:

- Differential pressure
- Level
- Volume
- Mass
- Volume flow
- Mass flow

Benefits

- High measuring accuracy
- Very fast response time
- Extremely good long-term stability
- High reliability even under extreme chemical and mechanical loads
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions which can be used both on site as well as via HART.
- Optional separate replacement of measuring cell and electronics without recalibration.
- Extremely low conformity error values
- Infinitely adjustable spans of 0.018 to 18 psi (1.25 to 1250 mbar)
- Extremely good total performance and conformity error values with no loss of performance up to a turndown of 10 guaranteed.
- Additional integrated sensor for static pressure
- Parameterization via on-site control keys or HART
- Short process flanges nable space-saving installation.

Application

The SITRANS P500 pressure transmitters can be used in industrial areas with extreme chemical and mechanical loads. Electromagnetic compatibility in the range 10 kHz to 1 GHz makes them suitable for locations with high electromagnetic emissions.

Pressure transmitters with ratings "Intrinsic safety" and "Explosion-proof" may be installed within potentially explosive atmospheres (zone 1) or in zone 0. The pressure transmitter comes with a CE-declaration of conformity and fulfils the corresponding unified European directives (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".

With newly designed measuring cell, it is possible to work with process temperatures of -40 to 125 °C (-40 to +257 °F)) without having to use a remote seal.

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

The pressure transmitter can be fully parameterized locally via the three operating keys and externally via HART.

SITRANS P500
Technical description

Pressure transmitters for differential pressure and flow

- Measured variables:
  - Differential pressure
  - Small positive or negative pressure
  - Flow q ~ √Δp (together with a primary element (see Chapter "Flow Meters"))
- Span (freely adjustable) for SITRANS P500 HART: 0.5 to 502 inH_2O (1.25 to 1250 mbar)

Pressure transmitters for level

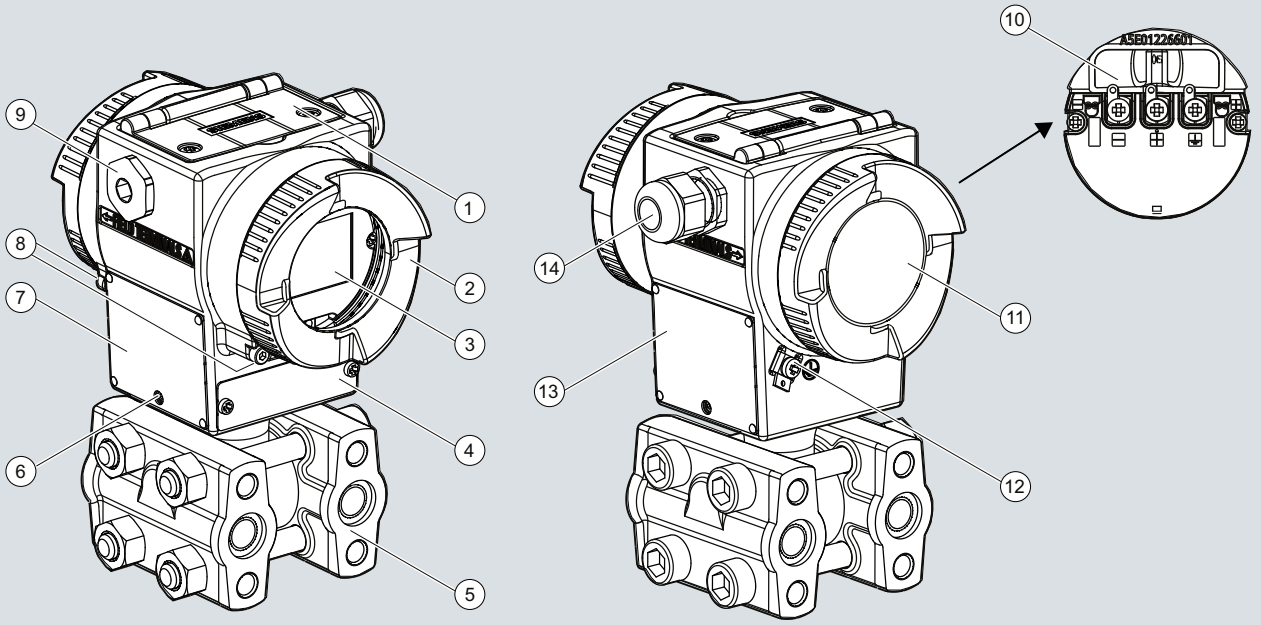
- Measured variable: Level of aggressive and non-aggressive liquids in open and closed vessels.
- Span (freely adjustable) for SITRANS P500: 0.5 to 502 inH_2O (1.25 to 1250 mbar)
- Nominal diameter of the mounting flange
  - DN 50 / PN 40
  - DN 80 / PN 40
  - DN 100/ PN 16, PN 40
  - 2 inch/class 150, class 300
  - 3 inch/class 150, class 300
  - 4 inch/ class 150, class 300
  - customized special version

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

In the case of measurements in closed vessels, the lower-pressure connection has to be connected to the vessel 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



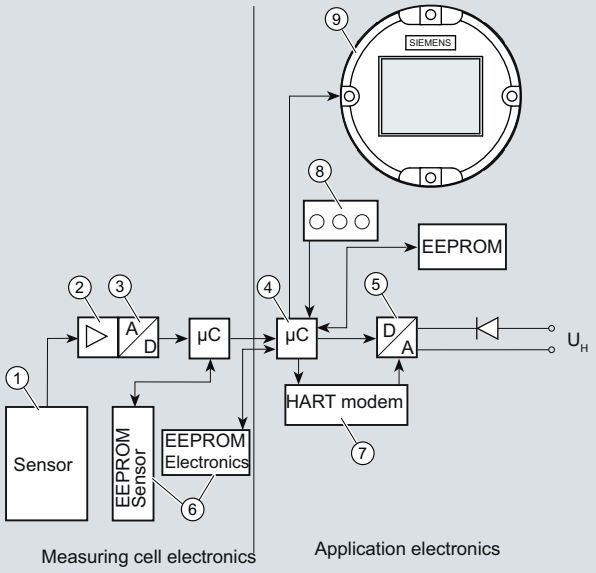
1 Cover for the pushbuttons
2 Cover, optionally with window
3 Display (optional)
4 TAG plate
5 Process flange with process connection
6 Lock screws (on two sides) for the measuring cell
7 Approval plate
8 Safety catch
9 Blanking plug
10 Terminal compartment
11 Cover for terminal compartment
12 PE/ground terminal
13 Nameplate
14 Cable inlet, optionally with cable gland or plug-in connection

View of transmitter

- The electronics housing is made of coated die-cast aluminum.
- The casing has round screwed covers front and back.
- Depending on the design the front cover is fitted with an inspection window. You can read off the measured value directly from the optional display through the window.
- The inlet to the terminal compartment is located either on the left or right side. The unused opening in each case is sealed by a blanking plug.
- The PE/ground terminal is on the back of the housing.
- Access to the terminal compartment for auxiliary power and shielding by unscrewing the cover.
- Beneath the electronic housing is the measuring cell with its process flanges at which the process connections are available. The modular design of the pressure transmitter lets you replace the measuring cell, electronics and connection board as required.
- On the top of the housing you can see the screwed cover of the three local pushbuttons of the transmitter.

Function

Operation of electronics with HART communication



1 Sensor of the measuring cell
2 Measuring amplifier
3 Analog-to-digital converter
4 Microcontroller
5 Digital-to-analog converter
6 One EEPROM each in the measuring cell and in the electronics
7 HART modem
8 Keys (local operation)
9 Digital display
I_A Output current
U_H Auxiliary power

Function diagram of electronics

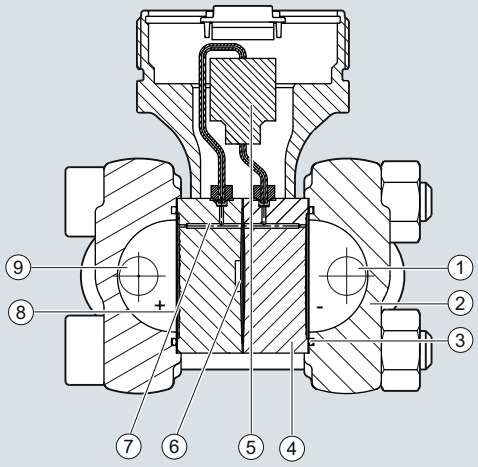
- The input pressure is converted into an electrical signal by the sensor.
- This signal is amplified by the measuring amplifier and digitalized in an analog-to-digital converter.
- The digital signal is analyzed in a microcontroller and corrected according to linearity and thermal characteristics.
- In a digital-to-analog converter it is then converted into the output current of 4 to 20 mA. When connected to supply lines, a diode circuit provides reverse polarity protection.
- The measuring cell-specific data, the electronic data and the parameterization data is held in two EEPROMs. One EEPROM is incorporated into the measuring cell electronics, the other is incorporated into the application electronics.

Operation

- The three local pushbuttons enable you both to navigate and carry out configuration and to visually track messages and process values, provided a display is available.
- If you have a device without a display, you can carry out zero adjustment using the three local pushbuttons. It is possible to retrofit a display at any time.
- You can also carry out settings by computer via a HART modem.

Mode of operation of the measuring cells

Measuring cell for differential pressure and flow



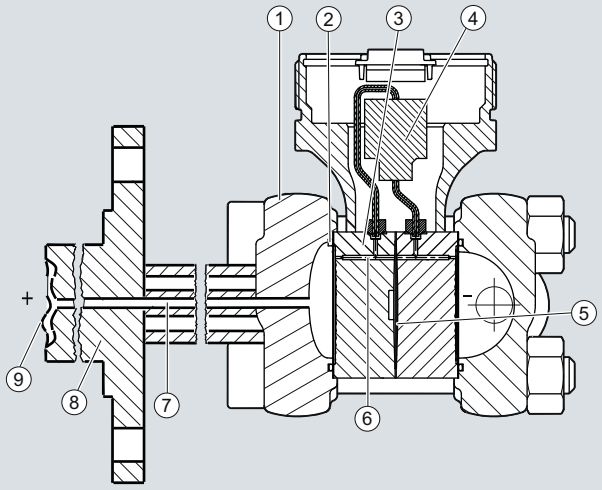
1 Input pressure P-
2 Process flange with process connection
3 O-Ring
4 Measuring cell body
5 Silicon pressure sensor
6 Overload diaphragm
7 Filling liquid
8 Seal diaphragm
9 Input pressure P+

Measuring cell for differential pressure and flow, function diagram

- The differential pressure is transmitted via the seal diaphragm and the filling liquid to the silicon pressure sensor.
- If the measuring limits are exceeded, the overload diaphragm flexes until it makes contact with the body of the measuring cell. This protects the sensor model from overload.
- The differential pressure causes the measuring diaphragm of the silicon pressure sensor to flex.
- The displacement changes the resistance value of the 4 piezo resistors in the measuring diaphragm in a bridge circuit.
- The change in the resistance causes a bridge output voltage proportional to the input pressure.

SITRANS P500
Technical description

Measuring cell for level



1 Process flange with process connection
2 O-Ring
3 Measuring cell body
4 Silicon pressure sensor
5 Overload diaphragm
6 Filling liquid of the measuring cell
7 Capillary tube with filling liquid of the mounting flange
8 Flange with optional tube
9 Seal diaphragm for mounting flange

Measuring cell for level, function diagram

- The input pressure (hydrostatic pressure) acts hydraulically on the measuring cell via the seal diaphragm on the mounting flange.
- The differential pressure applied to the measuring cell is transmitted via the seal diaphragm and the filling liquid to the silicon pressure sensor.
- If the measuring limits are exceeded, the overload diaphragm flexes until it makes contact with the body of the measuring cell. This protects the silicon pressure sensor from overload.
- The differential pressure causes the measuring diaphragm of the silicon pressure sensor to flex.
- The displacement changes the resistance value of the 4 piezo resistors in the measuring diaphragm in a bridge circuit.
- The change in the resistance causes a differential pressure proportional to the input pressure.

Configuration of SITRANS P500 HART

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

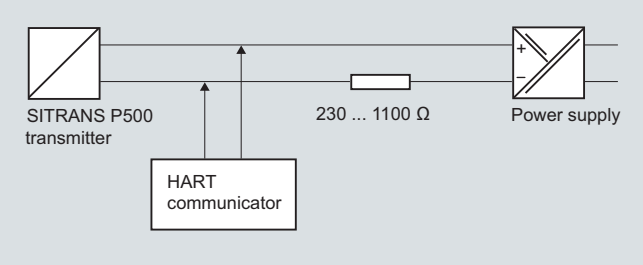
Configuration using the pushbuttons (local operation)

You can configure the transmitter in situ using the three keys provided a display is available. If you have no display, you can only carry out zero adjustment.

It is possible to retrofit a display. See accessories.

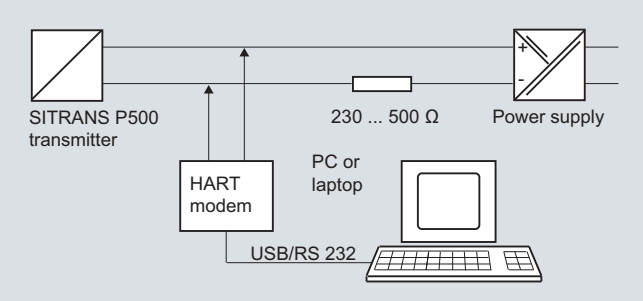
Configuration using HART

Parameterization using HART is carried out using a HART Communicator or a PC in conjunction with a HART modem.



Communication between a HART Communicator and a pressure transmitter

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



HART communication between a PC communicator and a pressure transmitter

For configuring via PC a HART modem is used which connects the transmitter to the PC.

The signals needed for communication in conformity with the HART 6.0 protocols are superimposed on the output current using the Frequency Shift Keying (FSK) method.

The necessary device files are available for download on the Internet.

SITRANS P500 configuration options

The transmission offers you full configuring options both via HART as well as in situ provided the optional display is available.

For simple parameterizing we also offer the easy to understand QuickStart function with guided commissioning.

SITRANS P500 diagnostic functions

- Maintenance timer
- Min/Max pointer (both resetable and non-resetable)
  - Pressure (incl. time and temperature stamp)
  - Static pressure (incl. time and temperature stamp)
  - Sensor temperature (incl. time stamp)
  - Electronic temperature (incl. time stamp)
- Limit monitor block
- Diagnostic warning
- Diagnostic alarm
- Simulation functions
- Display of trends and histograms
- Operating hours meter

Physical dimensions available for the SITRANS P500 HART display

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, mmH_2O (4 °C), inH_2O (4 °C), inH_2O (20 °C), mmH_2O, mmH_2O (4 °C), ftH_2O (20 °C), inHg, mmHg, hPA
Level	m, cm, mm, ft, in
Volume	m^3, dm^3, hl, yd^3, ft^3, in^3, gallon, Imp. gallon, bushel, barrel, barrel liquid, l; Norm (standard) l; Norm (standard) m^3, Norm (standard) feet^3
Mass	g, kg, t (metric), 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, gallon/s, l/h, milL/d, gallon/d, gallon/h, milgallon/d, Imp.gallon/s, Imp.gallon/m, Imp.gallon/h, Imp.gallon/d, Norm (standard) m^3/h, Norm (standard) l/h, Norm (standard) ft^3/h, Norm (standard) ft^3/m, barrel liquid/s, barrel liquid/m, barrel liquid/h
Mass flow	t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/h, g/min, g/s, lb/d, lb/min, lb/s, LTon/d, LTon/h, STon/d, STon/h, STon/min
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

2

Technical specifications

Input		
Measured variable	Differential pressure and flow	
Span (infinitely adjustable)	Span (min. ... max.)	Maximum operating pressure (static pressure)
	0.5 ... 100 inH_2O (1.25 ... 250 mbar)	2320 psi (160 bar)
	2.5 ... 500 inH_2O (6.25 ... 1250 mbar)	
Lower range limit		
• Measuring cell with silicone oil filling	-100 % of max. span and/or 0.44 psia (30 mbar a)	
Upper range limit	100 % of max. span	
Start of scale	Between measuring limits (freely adjustable)	
Output		
Output current signal	4 ... 20 mA	
• Lower current limit (freely adjustable)	3.55 mA, factory setting 3.8 mA	
• Upper current limit (freely adjustable)	23 mA, factory setting 20.5 mA	
• Ripple (without HART communication)	I_{pp} ≤ 0.4 % of max. output current	
• adjustable damping	0... 100 s in steps of 0.1 s, factory-seting: 2 s	
• current transmitter	3.55 ... 23 mA	
• Failure signal	adjustable within limits: • Lower: 3.55 … 3.7 mA (factory setting 3.6 mA • Upper: 21.0 … 23 mA (factory setting 22.8 mA	
Load		
• Without HART communication	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H : Power supply in V	
• With HART communication		
- HART Communicator	R_B = 230 ... 1100 Ω	
- HART modem	R_B = 230 ... 500 Ω	
Characteristic curve	Linearly rising, linearly falling, square rooted characteristic rising, bidirectional square rooted characteristic and user-specific	
Measuring accuracy		
Reference conditions (in accordance with IEC 60770-1)	• Rising characteristic curve • Start of scale 0 bar • Stainless steel seal diaphragm • Measuring cell with silicone oil filling • Room temperature (25 °C (77 °F))	
Error in measurement at limit setting incl. hysteresis and reproducibility r: Span ratio (r: Span ratio (r = max. span / set span))		
Linear characteristic		
• r ≤ 10	≤ 0,03 %	
• r> 10	≤ (0,003· r) %	
Square-rooted characteristic		
• Flow > 50%		
- r ≤ 10	≤ 0,03 %	
- r > 10	≤ (0,003· r) %	
• Flow 25 % … 50 %		
- r ≤ 10	≤ 0,06 %	
- r > 10	≤ (0,006 · r) %	
Influence of ambient temperature per 28° C	≤ (0.01 x r + 0.035) %/28 °C (50 °F)	
Influence of static pressure		
• On the zero point (PKN)[1)]	≤ 0.007 % per 70 bar	
• On the span (PKS)	≤ 0.03 % per 70 bar	
Total accuracy (Total Performance)[2)]		
Linear characteristic		
• r + 5	≤ 0,09 %	
• 5 < r ≤ 10	≤ 0,14 %	
Square-rooted characteristic		
• Flow > 50 %		
- r + 5	≤ 0,09 %	
- 5 < r ≤ 10	≤ 0,14 %	
• Flow 25 % … 50 %		
- r + 5	≤ 0,18 %	
- 5 < r ≤ 10	≤ 0,28 %	
Step response time T_{63} without electrical damping	≤ 88 ms	
Long-term stability	≤ 0.05 % per 5 years ≤ 0.08 % per 10 years	
Influence of power supply	≤ 0.005 %/1 V	
Rated conditions		
Mounting position	Any	
Ambient conditions		
• Ambient temperature (Note: Observe the temperature class in areas subject to explosion hazard.)		
- Total device	-40 ... +85 °C (-40 ... +185 °F)	
- Readable display	-20 ... +85 °C (-4 ... +185 °F)	
- Storage temperature	-50 ... +90 °C (-58 ... +194 °F)	
Climatic class		
• Condensation	Relative humidity 0 … 100 % (condensation permissible)	
Degree of protection (to IEC 60529)	IP66/IP 68 and NEMA 4X (with corresponding cable gland)	
Electromagnetic Compatibility		
• Emitted interference and interference immunity	Acc. to EN 61326 and NAMUR NE 21	
Permissible pressures	According to 97/23/EC pressure equipment directive	
Temperature of medium		
• Measuring cell with silicone oil filling	-40 ... +125 °C (-40 ... +257 °F)	

Design	
Weight (without options)	Approx. 3.3 kg (7.3 lb)
Material of parts in contact with the medium	
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L
• Process connection and sealing screw	PN 160: stainless steel, mat.-No. 1.4404/316L
• O-Ring	Standard: Viton (FKM (FPM)) optional: NBR
Material of parts not in contact with media	
Electronics housing	• Low copper die-cast aluminum AC-AlSi12 (Fe) or AC-AlSi 10 Mg (Fe) to DIN EN 1706 • Lacquer on polyurethane base, optional epoxy-based primer • Stainless steel name plates (mat. no. 1.4404/316L)
Process connection screws	Stainless steel, mat. no. 1.4404/316L
Mounting bracket	Steel or stainless steel mat. no. 1.4301
Measuring cell filling	Silicone oil
Process connection	¼-18 NPT female thread and flange connection with M10 to DIN 19213 or 7/16-20 UNF mounting thread to IEC 61518
Electrical connection	• Screw terminals • Cable entry via the following screwed glands: - M20 x 1.5 - ½-14 NPT - Han 7D/Han 8D connector - M12 plug
Displays and controls	
Pushbuttons	3 for local programming directly on transmitter
Display	• With or without integrated display • Cover with or without window
Auxiliary power supply	
Terminal voltage on transmitter	• DC 10.6 ... 44 V • With intrinsically-safe operation DC 10.6 ... 30 V
Certificates and approvals	
Classification according to PED 97/23/EC	
• PN 160 (MAWP 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)
Explosion protection	
Explosion protection for Europe (to ATEX)	
• Intrinsic safety "i"	PTB 09 ATEX 2004 X
- Marking	Ex II 1/2 G Ex ia/ib IIC T4
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω
- Effective internal inductance:	L_i = 400 µH
- Effective inner capacitance:	C_i = 6 nF
• Explosion-proof "d"	BVS 09 ATEX E 027
- Marking	Ex II 1/2 G Ex 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_m = DC 10.5 ... 45 V
• Dust explosion protection for zone 20	PTB 09 ATEX 2004 X
- Marking	Ex II 1 D Ex iaD 20 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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω
- Effective internal inductance:	L_i = 400 µH
- Effective inner capacitance:	C_i = 6 nF
• Dust explosion protection for zone 21/22	BVS 09 ATEX E 027
- Marking	Ex II 2 D Ex tD A21 IP68 T120 °C Ex ia D21
- Connection	To circuits with values: U_m = 10.5 ... 45 V DC; P_{max} = 1.2 W
• Type of protection "n" (zone 2)	PTB 09 ATEX 2004 X
- Marking	Ex II 3 G Ex nA II T4/T6 Ex II 2/3 G Ex ib/nL IIC T4/T6 Ex II 2/3 G Ex ib/ic IIC T4/T6
- "nA" connection	U_m = 45 V DC
- "nL, ic" connection	U_i = 45 V
- Effective internal inductance:	L_i = 400 µH
- Effective inner capacitance:	C_i = 6 nF
Explosion protection for USA (to FM)	
Certificate of Compliance	No. 3033013
• Identification (XP/DIP) or (IS)	XP CL I, DIV 1, GP ABCDEFG T4 / T6 DIP CL II, III, DIV1, GP EFG T4/T6 IS CL I, II, III, DIV1, GP ABCDEFG T4 CL I, Zone 0, AEx ia IIC T4 CL I, Zone 1, AEx ib IIC T4
- Permissible Ambient Temperature	T_a = T4: -40 ... +85 °C (-40 ... +185 °F) T_a = T6: -40 ... +60 °C (-40 ... +140 °F)
- Entity parameters	According to "control drawing": A5E02189134N U_m = 30 V, I_m = 100 mA, P_i = 750 mW, L_i = 400µH , Ci = 6 nF
• Marking (NI/NO)	NI CL I, DIV 2, GP ABCD T4/T6 NI CL I, Zone 2, GP IIC T4/T6 S CL II, III, GPFG T4/T6 NI CL I, DIV 2, GP ABCD T4/T6, NIFW NI CL I, Zone 2, GP IIC T4/T6, NIFW NI CLII, III, DIV 2, GP FG T4/T6, NIFW
- Permissible Ambient Temperature	T_a = T4: -40 ... +85 °C (-40 ... +185 °F) T_a = T6: -40 ... +60 °C (-40 ... +140 °F)
- (NI/S) parameters	According to "control drawing": A5E02189134N U_m = 45 V, L_i = 400 µH, C_i = 6 nF,

SITRANS P500
for differential pressure and flow

Explosion protection for Canada (to $_{C}CSA_{US}$)	
Certificate of Compliance	No. 2280963
• Marking (XP/DIP)	CL I, DIV 1, GP ABCD T4 /T6; CL II, DIV 1, GP EFG T4/T6
- Permissible ambient temperature	T_a = T4: -40 ... +85 °C (-40 ... +185 °F) T_a = T6: -40 ... +60 °C (-40 ... +140 °F)
- Entity parameters	According to "control drawing": A5E02189134N U_m = 45 V
• Marking (ia/ib)	CL I, Ex ia/Ex ib IIC, T4 CL II, III, Ex ia/Ex ib, GP EFG, T4 CL I, AEx ia/AEx ib IIC, T4 CL II, III, AEx ia/ AEx ib, GP EFG, T4
- Permissible ambient temperature	T_a = T4: -40 ... +85 °C (-40 ... +185 °F)
- Entity parameters	U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω , L_i = 400 µH, C_i = 6 nF
• Marking (NI/n)	CL I, DIV 2, GP ABCD T4/T6 CL II, III, DIV 2, GP FG T4/T6 Ex nA IIC T4/T6 AEx nA IIC T4/T6 Ex nL IIC T4/T6 AEx nL IIC T4/T6
- Permissible ambient temperature	T_a = T4: -40 ... +85 °C (-40 ... +185 °F) T_a = T6: -40 ... +60 °C (-40 ... +140 °F)
- NI/nA parameters	According to "control drawing": A5E02189134N U_m = 45 V
- nL parameters	According to "control drawing": A5E02189134N U_i = 45 V, I_i = 100 mA, L_i = 400 µH, C_i = 6 nF
Explosion protection for China (acc. to NEPSI)	
• Intrinsic safety "i"	GYJ111111X
- Marking	Ex ia/ib IIB/IIC T4
- Perm. ambient temperature	40 ... +85 °C (-40 ... +185 °F)
- Connection	To certified intrinsically-safe circuits with maximum values: U_i = 30 V I_i = 100 mA, P_i = 750 mW
- Effective internal inductance	L_i = 400 mH
- Effective inner capacitance	C_i = 6 nF
• Explosion-proof "d"	GYJ111112
- Marking	Ex dia 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_m = DC 10.5 ... 45 V
• Dust explosion protection for zone 21/22	GYJ111112
- Marking	DIP A21 TA,T120 °C IP68 D21
- Connection	To circuits with values: U_m = DC 10.5 ... 45 V
• Type of protection "n" (zone 2)	GYJ111111X
- Marking	Ex nL IIB/IIC T4/T6 Ex nA II T4/T6
- Connection	U_i = 45 V DC
- Effective internal inductance	L_i = 400 mH
- Effective inner capacitance	C_i = 6 nF

1) If the Type "D" measuring cell is used, the error should be increased by a factor of 5. This error can be reduced to 0 by a means of a zero adjustment.

2) The total performance includes the errors caused by temperature effects, static pressure effects and conformity error, including hysteresis and repeatability.

HART communication	
Load with connection of	
• HART communicator	R_B = 230 ... 1100 Ω
• HART modem	R_B = 230 ... 500 Ω
Cable	2 wire shielded: ≤ 3.0 km (1.86 miles), multiwire shielded: ≤ 1.5 km (0.93 miles)
Protocol	HART Version 6.0
PC/laptop requirements	IBM compatible, RAM > 32 MByte, hard disk > 70 MByte, depending on modem type: RS 232-interface or USB connection, VGA graphics
Software for computer	SIMATIC PDM 6.0

Selection and Ordering data

Order No.

D) 7MF54 - 0

Pressure transmitters for differential pressure and flow, SITRANS P500 HART, PN 160 (MAWP 2320 psi)

Enclosure	**Thread for cable gland**	
Die-cast aluminum, dual compartment	M20x1.5	0
Die-cast aluminum, dual compartment	½-14 NPT	1
Output		
4 ... 20 mA, HART		3
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Measuring span		
0.5 ... 100.4 inH_2O	(1.25 ... 250 mbar)	D
2.5 ... 502 inH_2O	(6.25 ... 1250 mbar)	E
Wetted parts materials (stainless steel process flanges)		
Seal diaphragm	Process connection	
stainless steel	stainless steel	A
Hastelloy	stainless steel	B
Monel	stainless steel	C
Process connection		
Female thread ¼-18 NPT		
• Sealing screw opposite process connection		
- Mounting thread 7/16 - 20 UNF according to EN 61518		0
- Mounting thread M10 to DIN 19213		1
• Vent on side of process flange[1)]		
- Mounting thread 7/16 - 20 UNF according to EN 61518		4
- Mounting thread M10 to DIN 19213		5

[1)] Not in conjunction with remote seals

D) Subject to export regulations AL: N, ECCN: EAR99H.

SITRANS P500
for differential pressure and flow

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Order No. and specify Order Code.	
Attachments	
Mounting bracket made of steel	**A01**
Mounting bracket made of stainless steel	**A02**
Display (Standard: no display, cover closed)	
With display and blanking cover	**A10**
With display and glass cover	**A11**
Special casing / cover version	
Two coats of lacquer on casing, cover (PU on epoxy)	**A20**
Electrical connection and cable entry (Standard: no cable gland, only dust protection caps)	
Cable gland made of plastic (IP66/68)[4]	**A50**
Cable glands made of metal (IP66/68)	**A51**
Cable glands made of stainless steel (IP66/68)	**A52**
M12 connectors without cable socket (IP66/67)[4]	**A60**
M12 connectors complete with cable socket (IP66/67)[4]	**A61**
Han 7D connectors, plastic, straight (with cable socket) (IP65)[4]	**A71**
Han 7D connectors, plastic, angled (with cable socket) (IP65)[4]	**A72**
Han 7D connectors, metal enclosure, straight (with cable socket) (IP65)[4]	**A73**
Han 7D connectors, metal enclosure, angled (with cable socket) (IP65)[4]	**A74**
Han 8D connectors, plastic, straight (with cable socket) (IP65)[4][8]	**A75**
Han 8D connectors, plastic, angled (with cable socket) (IP65)[4][8]	**A76**
Han 8D connectors, metal enclosure, straight (with cable socket) (IP65)[4][8]	**A77**
Han 8D connectors, metal enclosure, angled (with cable socket) (IP65)[4][8]	**A78**
PG 13.5 adapters[4]	**A82**
Language for labels, leporellos, menu language default [9] (instead of English as standard)	
German	**B10**
French	**B12**
Spanish	**B13**
Italian	**B14**
Chinese	**B15**
Russian	**B16**
Japanese	**B17**
English with units psi/inH_2O/°F	**B21**
Special version: Supplementary menu languages (Standard: English, German, French, Spanish, Italian)	
Asia language package (in addition: Chinese, Japanese, Russian)	**B80**
Certificates (available online for downloading)[1]	
Quality inspection certificate (Five-step factory calibration) according to IEC 60770-2[2]	**C11**
Acceptance test certificate according to EN 10204-3.1[3]	**C12**

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Order No. and specify Order Code.	
Degree of protection approvals: Ex ia/ib (intrinsic safety)	
Ex ia/ib protection (ATEX) (T4)	**E00**
Ex IS protection (FM) (T4)	**E01**
Ex IS protection ($_C$CSA$_{US}$) (T4)	**E02**
Ex ia/ib protection (NEPSI) (T4)	**E06**
Degree of protection approvals: Ex d (flameproof)	
Ex d explosion-proof (ATEX)(T4/T6)	**E20**
Ex XP explosion-proof and DIP (FM)(T4/T6)	**E21**
Ex XP explosion-proof and DIP ($_C$CSA$_{US}$)(T4/T6)	**E22**
Ex d explosion-proof (NEPSI)(T4/T6)	**E26**
Degree of protection approvals: n/NI	
Zone 2 (nA, nL, ic) (ATEX) (T4/T6)	**E40**
Div2 NI, Div2 NI-field wiring (FM) (T4/T6)	**E41**
Zone 2 (nA, nL), Div2 NI ($_C$CSA$_{US}$) (T4/T6)	**E42**
Zone 2 (nA, nL) (NEPSI) (T4/T6)	**E46**
Degree of protection approvals: Dust Zone 20/21/22	
Use in Zone 21/22 (Ex tD) (ATEX)	**E60**
Use in Zone 20/21/22 (Ex iaD) (ATEX)	**E61**
Use in Zone 21/22 (Ex DIP) (NEPSI)	**E66**
Degree of protection approvals: Combinations	
IS protection and XP and DIP (FM)	**E71**
IS protection and XP and DIP ($_C$CSA$_{US}$)	**E72**
IS protection and XP and DIP (FM/$_C$CSA$_{US}$)	**E73**
Supplementary approvals/degree of protection	
Dual Seal approval[5]	**E85**
Special process connection versions (diff. pressure)	
Side vents for gas measurements[7]	**L32**
Swap process connection: high-pressure side at front	**L33**
Process flanges, O-rings, special material Standard: Viton (FKM (FPM)	
Process connection sealing rings made of PTFE (Teflon), virginal	**L60**
Process connection sealing rings made of PTFE (Teflon), glass fiber-reinforced	**L61**
Process connection sealing rings made of FFPM (Kalrez)	**L62**
Process connection sealing rings made of NBR	**L63**
Drain/Vent valve (1 set = 2 units)	
2 ventilation valves ¼- 18 NPT, in material of process flanges)	**L80**
Remote seals	
Transmitters with connection of remote seal[6]	**V00**
(For premounted valve manifolds see page 2/175)	

1) Enclosed in print or as CD: see page 2/173.

2) When also ordering the quality inspection certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.

3) When also ordering the acceptance test certificate according to EN 10204-3.1 for transmitters with mounted diaphragm seals: Order this certificate as well in addition to the respective remote seals.

4) Not together with types of protection "Explosion-proof", "Ex nA" and "Intrinsic safety and explosion-proof"

5) Only in conjunction with FM and/or $_C$CSA$_{US}$

6) Please select a remote seal separately.
Also refer to the information under 2).

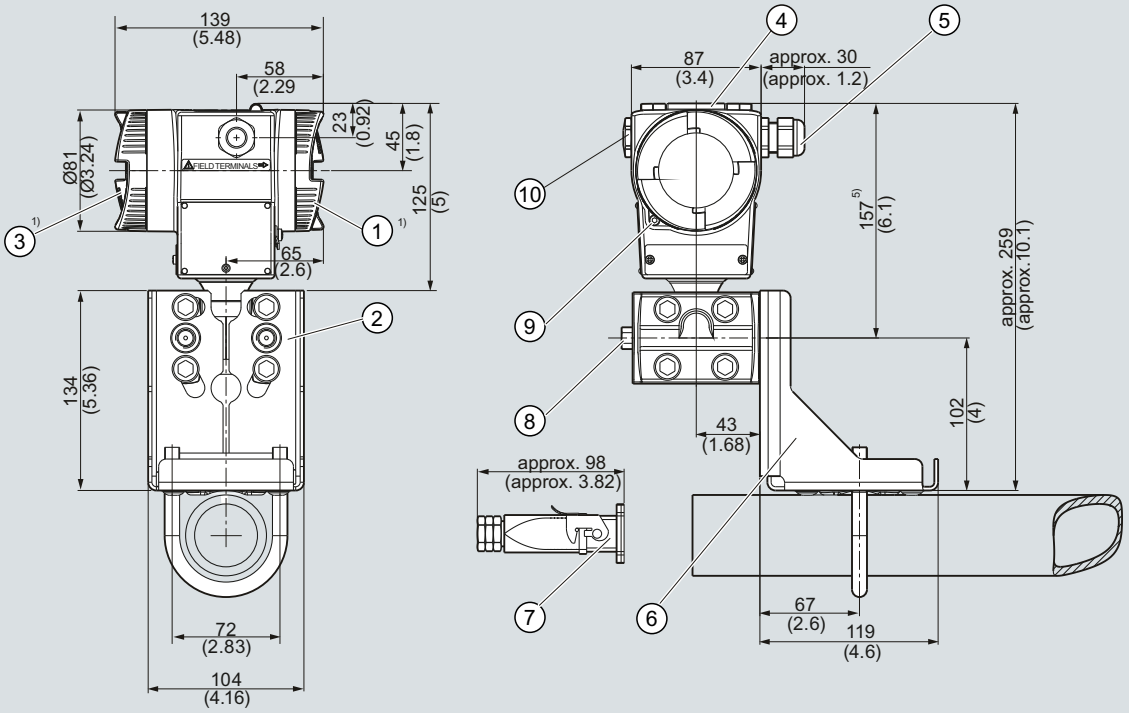
7) Only in conjunction with process connection "Vent on side".

8) The Han 8D plug is identical with the former Han 8U version.

9) For option B15, B16 and B17 the menu language default is english. Otherwise the Option B80 (Asia language package) is necessary.

Selection and Ordering data	Order code
Additional data Please add "**-Z**" to Order No. and specify Order code(s) and plain text.	
Measuring range to be set	
Specify in plain text:	
• in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	**Y01**
• in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	**Y02**
Measuring point number and measuring point identifier (only standard ASCII character set)	
Specify in plain text:	
Measuring point number (TAG No.), max. 16 characters Y15:	**Y15**
Measuring point text (max. 27 char.) Y16:	**Y16**
Entry of HART address (TAG), max. 32 characters Y17:	**Y17**
Setting of pressure indication in pressure units	**Y21**
Specify in plain text (standard setting: mbar) Y21: bar, kPa, MPa, psi, ...	
Note: The following pressure units are selectable: bar, mbar, mm H_2O*), in H_2O*), ftH_2O*), mmHG, inHG, psi, Pa, kPa, MPa, g/cm^2, kg/cm^2, Torr, ATM, % or mA	
*) Reference temperature 20 °C	
Setting of pressure indication in non-pressure units	**Y22 +**
Specify in plain text:	**Y01 or Y02**
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)	
Customer-specific settings	
Damping setting (range: 0 ... 100 s) (Standard setting: 2 s)	**Y30**

Dimensional drawings



1 Terminal side
2 Process connection: ¼-18 NPT (EN61518)
3 Electronics side, digital display
4 Protective cover for the pushbuttons
5 Cable entry:
- Screwed gland M20 x 1.5[3)]
- Screwed gland ½-14 NPT
- Han 7D/Han 8D connector[2)3)]
- M12 connector

6 Mounting bracket (optional)
7 Electrical connection:
- Han 7D/Han 8D connector/socket[2)3)]

8 Vent valve (optional)
9 Safety catch
10 Blanking plug

1) Allow approx. 20 mm (0.79 inch) additional thread length

2) Not with type of protection "Explosion-proof"
3) Not with type of protection "FM + $_{C}$CSA$_{US}$ [IS + XP]"

SITRANS P pressure transmitter for differential pressure and flow, P500 series, measurements in mm (inch)

Technical specifications

Input		
Measured variable	Level	
Span (infinitely adjustable)	Span (min. ... max.)	Maximum operating pressure
	0.5 … 100 inH_2O (1.25 ... 250 mbar)	See "Mounting flange"
	2.5 … 500 inH_2O (6.25 ... 1250 mbar)	
Lower range limit		
• Measuring cell with silicone oil filling	-100 % of max. span or 0.44 psia (30 mbar a) vacuum resistance (available as an option)	
Upper range limit	100% of max. span	
Start of scale	Between measuring limits (freely adjustable)	
Output		
Output current signal	4 ... 20 mA	
• Lower current limit (freely adjustable)	3.55 mA, factory setting 3.8 mA	
• Upper current limit (freely adjustable)	23 mA, factory setting 20.5 mA	
• Ripple (without HART communication)	I_{pp} ≤ 0.4 of max. output current	
• adjustable damping	0... 100 s in steps of 0.1 s, factory setting 2 s	
• current transmitter	3.55 ... 23 mA	
• Failure signal	adjustable within limits: • Lower: 3.55 … 3.7 mA (factory setting 3.6 mA) • Upper: 21.0 … 23 mA (factory setting 22.8 mA)	
Load		
• Without HART communication	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H : Power supply in V	
• With HART communication		
- HART Communicator	R_B = 230 ... 1100 Ω	
- HART modem	R_B = 230 ... 500 Ω	
Characteristic curve	Linearly rising or linearly falling and user-specific	
Measuring accuracy		
Reference conditions (in accordance with IEC 60770-1)	• Rising characteristic curve • Start of scale 0 bar • Stainless steel seal diaphragm • Measuring cell with silicone oil filling • Room temperature (25 °C (77 °F))	
Error in measurement at limit setting incl. hysteresis and reproducibility r: Span ratio (r = max. span / set span)		
• Linear characteristic		
- r ≤ 10	≤ 0.03 %	
- r > 10	≤ (0.003 · r) %	
Long-term stability	≤ 0.05 % per 5 years	
	≤ 0.08 % per 10 years	
Influence of ambient temperature per 28 °C[1]	≤ (0.01 · r + 0.035) % / 28 °C	
Influence of static pressure		
• On the zero point (PKN)[2]	≤ (0.007 · r) % per 70 bar	
• on the span (PKS)	≤ 0.03 % per 70 bar	
Influence of power supply	≤ 0.005 %/1 V	
Rated conditions		
Mounting position	Defined by flange	
Ambient conditions		
• Ambient temperature (Note: Observe the temperature class in areas subject to explosion hazard.)		
- total device	-40 ... +85 °C (-40 ... +185 °F)	
- Readable display	-20 ... +85 °C (-4 ... +185 °F)	
- Storage temperature	-50 ... +90 °C (-58 ... +194 °F)	
Climatic class		
• Condensation	Relative humidity 0 … 100 % (condensation permissible)	
Degree of protection to IEC 60529	IP66/IP68 and NEMA 4X (with corresponding cable gland)	
Electromagnetic Compatibility		
• Emitted interference and interference immunity	Acc. to EN 61326 and NAMUR NE 21	
Permissible pressures	According to 97/23/EC pressure equipment directive	
Medium temperature of minus side		
• Measuring cell with silicone oil filling	-40 ... +125 °C (-40 ... +257 °F)	
Design		
Weight		
• To EN (pressure transmitter with mounting flange, without tube)	approx. 9.8 … 11.8 kg (21.6… 26.0 (lb)	
• To ASME (pressure transmitter with mounting flange, without tube)	approx. 9.8 … 16.8 kg (21.6 … 37.0 lb)	
Material of parts in contact with the medium		
• High-pressure side		
- Seal diaphragm of mounting flange	Stainless steel , mat. no. 1.4404/316L, Monel 400, W-Nr. 2.4360, Hastelloy B2, mat. no. 2.4617, Hastelloy C276, mat. no. 2.4819, Hastelloy C4,mat. no. 2.4610, Tantal, PTFE, ECTFE	
- Sealing face	Smooth to EN 1092-1, Form b1 and/or ASME B16.5 RF 125 … 250 AA for stainless steel316L, EN1092-1 Form B2 and/or ASME B16.5 RFSF in the case of other materials	
• Sealing material in the process connections		
- For standard applications	PTFE	
- For vacuum application of mounting flange	copper	
• Low-pressure side		
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L	
- Process connection and sealing screw	• Stainless steel, mat. no. 1.4404/316L	
- O-Ring	Standard: Viton (FKM(FPM)) optional: NBR	

SITRANS P500 for level

Material of parts not in contact with media	
Electronics housing	• Low copper die-cast aluminum AC-AlSi12 (Fe) or AC-AlSi 10 Mg (Fe) to DIN EN 1706 • Lacquer on polyurethane base, optional epoxy-based primer • Stainless steel serial plate
Process connection screws	Stainless steel
Measuring cell filling	Silicone oil
• Liquid mounting flange	Silicone oil or other material
Process connection	
• High-pressure side	Flange to EN and ASME
• Low-pressure side	¼-18 NPT female thread and flange connection with M10 to DIN 19213 or 7/16-20 UNF mounting thread to IEC 61518
Electrical connection	• Screw terminals • Cable entry via the following screwed glands: - M20 x 1.5 - ½-14 NPT - Han 7D/Han 8D connector - M12 plug
Displays and controls	
Push buttons	3; for operation directly on the device
Display	• With or without integrated display • Cover with or without window
Auxiliary power supply	
Terminal voltage on transmitter	• DC 10,6 ... 44 V • With intrinsically-safe operation DC 10.6 ... 30 V
Certificates and approvals	
Classification according to PED 97/23/EC	
• PN 160 (MAWP 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)
Explosion protection	
Explosion protection for Europe (to ATEX)	
• Intrinsic safety "i"	PTB 09 ATEX 2004 X
- Marking	Ex II 1/2 G Ex ia/ib IIC T4
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω
- Effective internal inductance:	L_i = 400 µH
- Effective inner capacitance:	C_i = 6 nF
• Explosion-proof "d"	BVS 09 ATEX E 027
- Marking	Ex II 1/2 G Ex 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_m = DC 10.5 ... 45 V
• Dust explosion protection for zone 20	PTB 09 ATEX 2004 X
- Marking	Ex II 1 D Ex iaD 20 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 peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω
- Effective internal inductance:	L_i = 400 µH
- Effective inner capacitance:	C_i = 6 nF
• Dust explosion protection for zone 21/22	BVS 09 ATEX E 027
- Marking	Ex II 2 D Ex tD A21 IP68 T120 °C Ex ia D21
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC; P_{max} = 1.2 W
• Type of protection "n" (zone 2)	PTB 09 ATEX 2004 X
- Marking	Ex II 3 G Ex nA II T4/T6 Ex II 2/3 G Ex ib/nL IIC T4/T6 Ex II 2/3 G Ex ib/ic IIC T4/T6
- "nA" connection	U_m = 45 V DC
- "nL, ic" connection	U_i = 45 V
- Effective internal inductance	L_i = 400 µH
- Effective inner capacitance	C_i = 6 nF
Explosion protection for USA (to FM)	
Certificate of Compliance	No. 3033013
• Identification (XP/DIP) or (IS)	XP CL I, DIV 1, GP ABCDEFG T4 / T6 DIP CL II, III, DIV1, GP EFG T4/T6 IS CL I, II, III, DIV1, GP ABCDEFG T4 CL I, Zone 0, AEx ia IIC T4 CL I, Zone 1, AEX ib IIC T4
- Permissible Ambient Temperature	T_a = T4: -40 ... +85 °C (-40 ... +185 °F) T_a = T6: -40 ... +60 °C (-40 ... +140 °F)
- Entity parameters	According to "control drawing": A5E02189134N U_m = 30 V, I_m = 100 mA, P_i = 750 mW, L_i = 400 µH , C_i = 6 nF
• Marking (NI/NO)	NI CL I, DIV 2, GP ABCD T4/T6 NI CL I, Zone 2, GP IIC T4/T6 S CL II, III, GPFG T4/T6 NI CL I, DIV 2, GP ABCD T4/T6, NIFW NI CL I, Zone 2, GP IIC T4/T6, NIFW NI CLII, III, DIV 2, GP FG T4/T6, NIFW
- Permissible Ambient Temperature	T_a = T4: -40 ... +85 °C (-40 ... +185 °F) T_a = T6: -40 ... +60 °C (-40 ... +140 °F)
- (NI/S) parameters	According to "control drawing": A5E02189134N U_m = 45 V, L_i = 400 µH, Ci = 6 nF

Explosion protection for Canada	
(to $_{C}CSA_{US}$)	
Certificate of Compliance	No. 2280963
• Marking (XP/DIP)	CL I, DIV 1, GP ABCD T4 /T6; CL II, DIV 1, GP EFG T4/T6
- Permissible Ambient Temperature	T_a = T4: -40 ... +85 °C (-40 ... +185 °F) T_a = T6: -40 ... +60 °C (-40 ... +140 °F)
- Entity parameters	According to "control drawing": A5E02189134N, U_m = 45 V
• Marking (ia/ib)	CL I, Ex ia/Ex ib IIC, T4 CL II, III, Ex ia/Ex ib, GP EFG, T4 CL I, AEx ia/AEx ib IIC, T4 CL II, III, AEx ia/ AEx ib, GP EFG, T4
- Permissible Ambient Temperature	T_a = T4: -40 ... +85 °C (-40 ... +185 °F)
- Entity parameters	U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω , L_i = 400 µH, C_i = 6 nF
• Marking (NI/n)	CL I, DIV2, GP ABCD T4/T6 CL II, III, DIV2, GP FG T4/T6 Ex nA IIC T4/T6 AEx nA IIC T4/T6 Ex nL IIC T4/T6 AEx nL IIC T4/T6
- Permissible Ambient Temperature	T_a = T4: -40 ... +85 °C (-40 ... +185 °F) T_a = T6: -40 ... +60 °C (-40 ... +140 °F)
- NI/nA parameters	According to "control drawing": A5E02189134N, U_m = 45 V
- nL parameters	According to "control drawing": A5E02189134N, U_i = 45 V, I_i = 100 mA, L_i = 400 µH, C_i = 6 nF
Explosion protection for China (acc. to NEPSI)	
• Intrinsic safety "i"	GYJ111111X
- Marking	Ex ia/ib IIB/IIC T4
- Permissible ambient temperature	40 ... +85 °C (-40 ... +185 °F)
- Connection	To certified intrinsically-safe circuits with maximum values: U_i = 30 V I_i = 100 mA, P_i = 750 mW
- Effective internal induc-	L_i = 400 mH
- Effective inner capaci-	C_i = 6 nF
• Explosion-proof "d"	GYJ111112
- Marking	Ex dia 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_m = DC 10.5 ... 45 V
• Dust explosion protection for zone 21/22	GYJ111112
- Marking	DIP A21 TA,T120 °C IP68 D21
- Connection	To circuits with values: U_m = DC 10.5 ... 45 V
• Type of protection "n" (zone	GYJ111111X
- Marking	Ex nL IIB/IIC T4/T6 Ex nA II T4/T6
- Connection	U_i = 45 V DC
- Effective internal induc-	L_i = 400 mH
- Effective inner capaci-	C_i = 6 nF

1) Only relevant for the pressure transmitter. The temperature error of the remote seal must calculated separately.

2) If the Type "D" measuring cell is used, the error should be increased by a factor of 5. This error can be reduced to 0 by a means of a zero adjustment.

HART communication	
Load with connection of	
• HART Communicator	R_B = 230 ... 1100 Ω
• HART modem	R_B = 230 ... 500 Ω
Cable	2 wire shielded: ≤ 3.0 km (1.86 miles), multiwire shielded: ≤ 1.5 km (0.93 miles)
Protocol	HART Version 6.0
PC/laptop requirements	IBM compatible, RAM > 32 MByte, hard disk > 70 MByte, depending on modem type: RS 232-interface or USB connection, VGA graphics
Software for computer	SIMATIC PDM 6.0

2

Selection and Ordering data		Order No.	Order code
Pressure transmitters for level, SITRANS P500 HART		D) 7MF56 - 0 -	
Enclosure	**Thread for cable gland**		
Die-cast aluminum, dual compartment	M20x1.5	0	
Die-cast aluminum, dual compartment	½-14 NPT	1	
Output			
4 ... 20 mA, HART		3	
Measuring cell filling	**Measuring cell cleaning**		
Silicone oil	normal	1	
Measuring span (min. ... max.)			
0.5 ... 100.4 inH_2O	(1.25 ... 250 mbar)	D	
2.5 ... 502 inH_2O	(6.25 ... 1250 mbar)	E	
Wetted parts of the low-pressure side (stainless steel process flanges)			
Seal diaphragm	Process connection		
stainless steel	stainless steel	A	
Hastelloy	stainless steel	B	
Monel	stainless steel	C	
Process connection of low-pressure side			
Female thread ¼-18 NPT			
• Sealing screw opposite process connection			
- Mounting thread 7/16 - 20 UNF according to IEC 61518		0	
- Mounting thread M10 to DIN 19213		1	
• Vent on side of process flange			
- Mounting thread 7/16 - 20 UNF according to IEC 61518		4	
- Mounting thread M10 to DIN 19213		5	
Wetted parts materials (high-pressure side)			
Stainless steel/316L		0	
Hastelloy C276		1	
Monel		2	
Tantalum		3	
PFA coated on steel/316L		4	
PTFE on stainless steel/316L (not in combination with an extension)		6	A
Other version Add order code and plain text: Material: ... ; Extension length: ...		9	Y N1Y
Process connection on high-pressure side: Extension length			
None			A
50 mm (1.97 inch)			B
100 mm (3.94 inch)			C
150 mm (5.90 inch)			D
200 mm (7.87 inch)			E
Other version: See option "9" for "Wetted parts materials"			
Process connection on high-pressure side: Nominal diameter/Nominal pressure			
DN 50, PN 40[6)]			B
DN 80, PN 40			D
DN 100, PN 16			G
DN 100, PN 40			H
2", class 150[6)]			L
2", class 300[6)]			M
3", class 150			Q
3", class 300			R
4", class 150			T
4", class 300			U
Other version, add Order Code and plain text: Nominal diameter: ... ; Nominal pressure: ...			Z Q1Y

Selection and Ordering data	Order No.	Order code
Pressure transmitters for level, SITRANS P500 HART	D) **7MF56** ■■ - ■■■■ **0** - ■■■■	■■■
Process connection on high-pressure side: Filling liquid		
Silicone oil M5	**0**	
Silicone oil M50	**1**	
High-temperature oil	**2**	
Halocarbon (for oxygen measurement)	**3**	
FDA compliant oil	**4**	
Glycerin/water	**5**	
Other version, add Order Code and plain text: Filling liquid: ...	**9**	**R1Y**

D) Subject to export regulations AL: N, ECCN: EAR99H.

SITRANS P500 for level

2

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Order No. and specify Order Code.	
Display (Standard: no display, cover closed)	
With display and blanking cover	**A10**
With display and glass cover	**A11**
Special version: cover/casing	
Two coats of lacquer on casing, cover (PU on epoxy)	**A20**
Electrical connection and cable entry (Standard: no cable gland, only dust protection caps)	
Cable gland made of plastic (IP66/68)[4]	**A50**
Cable glands made of metal (IP66/68)	**A51**
Cable glands made of stainless steel (IP66/68)	**A52**
M12 connectors without cable socket (IP66/67)[4]	**A60**
M12 connectors, cable socket (IP66/67)[4]	**A61**
Han 7D connectors, plastic, straight (with cable socket) (IP65)[4]	**A71**
Han 7D connectors, plastic, angled (with cable socket) (IP65)[4]	**A72**
Han 7D connectors, metal enclosure, straight (with cable socket) (IP65)[4]	**A73**
Han 7D connectors, metal enclosure, angled (with cable socket) (IP65)[4]	**A74**
Han 8D connectors, plastic, straight (with cable socket) (IP65)[4][7]	**A75**
Han 8D connectors, plastic, angled (with cable socket) (IP65)[4][7]	**A76**
Han 8D connectors, metal enclosure, straight (with cable socket) (IP65)[4][7]	**A77**
Han 8D connectors, metal enclosure, angled (with cable socket) (IP65)[4][7]	**A78**
PG 13.5 adapters[4]	**A82**
Language for labels, leporellos and menu language default[8] (instead of English as standard)	
German	**B10**
French	**B12**
Spanish	**B13**
Italian	**B14**
Chinese	**B15**
Russian	**B16**
Japanese	**B17**
English with units: psi/inH_2O	**B21**
Special version: Supplementary menu languages (Standard: English, German, French, Spanish, Italian)	
Asia language package (in addition: Chinese, Japanese, Russian)	**B80**
Certificates (available online for downloading)[1]	
Quality inspection certificate (Five-step factory calibration) according to IEC 60770-2[2]	**C11**
Acceptance test certificate according to EN 10204-3.1[3]	**C12**
Degree of protection approvals: Ex ia/ib (intrinsic safety)	
Ex ia/ib protection (ATEX) (T4)	**E00**
Ex IS protection (FM) (T4)	**E01**
Ex IS protection ($_C$CSA$_{US}$) (T4)	**E02**
Ex ia/ib protection (NEPSI) (T4)	**E06**

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Order No. and specify Order Code.	
Degree of protection approvals: Ex d (flameproof)	
Ex d explosion-proof (ATEX)(T4/T6)	**E20**
Ex XP explosion-proof and DIP (FM)(T4/T6)	**E21**
Ex XP explosion-proof and DIP ($_C$CSA$_{US}$)(T4/T6)	**E22**
Ex d explosion-proof (NEPSI)(T4/T6)	**E26**
Degree of protection approvals: n/NI	
Zone 2 (nA, nL, ic) (ATEX) (T4/T6)	**E40**
Div2 NI, Div2 NI-field wiring (FM) (T4/T6)	**E41**
Zone 2 (nA, nL), Div2 NI ($_C$CSA$_{US}$) (T4/T6)	**E42**
Zone 2 (nA, nL) (NEPSI) (T4/T6)	**E46**
Degree of protection approvals: Zone 20/21/22	
Use in Zone 21/22 (Ex tD) (ATEX)	**E60**
Use in Zone 20/21/22 (Ex iaD) (ATEX)	**E61**
Use in Zone (Ex DIP) (ATEX)	**E66**
Degree of protection approvals: Combinations	
IS protection and XP and DIP (FM)	**E71**
IS protection and XP and DIP ($_C$CSA$_{US}$)	**E72**
IS protection and XP and DIP (FM/$_C$CSA$_{US}$)	**E73**
Supplementary approvals / degree of protection	
Dual Seal approval[5]	**E85**
Special process connection versions (diff. pressure)	
Swap process connection: high-pressure side at front	**L33**
Process flanges, O-rings, special material Standard: Viton (FKM (FPM))	
Process connection sealing rings made of PTFE (Teflon), virginal	**L60**
Process connection sealing rings made of PTFE (Teflon), glass fiber-reinforced	**L61**
Process connection sealing rings made of FFPM (Kalrez)	**L62**
Process connection sealing rings made of NBR	**L63**
Drain/Vent valve (1 set = 2 units)	
2 ventilation valves ¼- 18 NPT, in material of process flange)	**L80**
Vacuum-proof design	
Vacuum service	**V04**
Spark arrester For mounting on zone 0 (including documentation)	**V05**

1) Enclosed in print or as CD: see page 2/173.

2) When also ordering the quality inspection certificate (factory calibration) according to IEC 60770-2 for transmitters with mounted diaphragm seals: Order this certificate only together with the remote seals. The measuring accuracy of the total combination is certified here.

3) When also ordering the acceptance test certificate according to EN 10204-3.1 for transmitters with mounted diaphragm seals: Order this certificate as well in addition to the respective remote seals.

4) Not together with types of protection "Explosion-proof", "Ex nA" and "Intrinsic safety and explosion-proof"

5) Only in conjunction with FM and/or $_C$CSA$_{US}$

6) Not recommended for Measuring span "D"

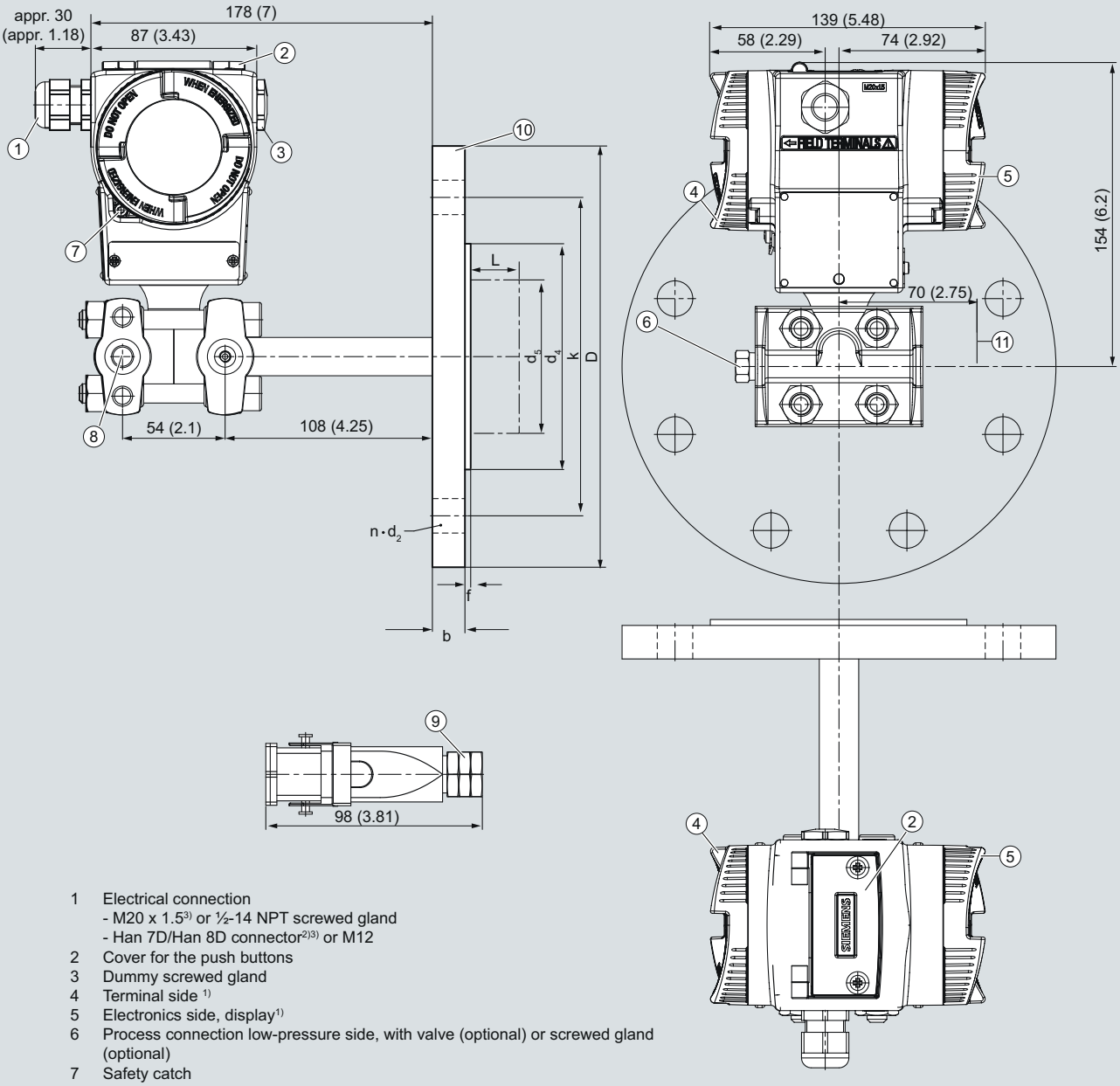
7) The Han 8D plug is identical with the former Han 8U version.

8) For option B15, B16 and B17 the menu language default is english. Otherwise the Option B80 (Asia language package) is necessary.

Selection and Ordering data	Order code
Additional data Please add "**-Z**" to Order No. and specify Order code(s) and plain text.	
Measuring range to be set	
Specify in plain text:	
Linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, kPa, MPa, psi	**Y01**
Measuring point number and measuring point identifier (only standard ASCII character set)	
Specify in plain text:	
Measuring point number (TAG No.), max. 16 characters	**Y15**
Y15:	
Measuring point text (max. 27 char.) Y16:	**Y16**
Entry of HART address (TAG), max. 32 characters Y17:	**Y17**
Setting of pressure indication in pressure units	**Y21**
Specify in plain text (standard setting: mbar) Y21: bar, kPa, MPa, psi, ...	
Note: The following pressure units are selectable: bar, mbar, mm H_2O*), in H_2O*), ftH_2O*), mmHG, inHG, psi, Pa, kPa, MPa, g/cm^2, kg/cm^2, Torr, ATM, % or mA	
*) Reference temperature 20 °C	
Setting of pressure indication in non-pressure units	**Y22 +**
Specify in plain text:	**Y01**
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)	
Customer-specific settings	
Damping setting (range: 0 ... 100 s) (Standard setting: 2 s)	**Y30**

2

Dimensional drawings



1 Electrical connection
- M20 x 1.5[3] or ½-14 NPT screwed gland
- Han 7D/Han 8D connector[2)3)] or M12

2 Cover for the push buttons
3 Dummy screwed gland
4 Terminal side [1)]
5 Electronics side, display[1)]
6 Process connection low-pressure side, with valve (optional) or screwed gland (optional)
7 Safety catch
(only for type of protection "Explosion-proof"; not shown in the diagram)
8 Process connection: low-pressure side ¼-18NPT (IEC 61518)
9 Electrical connection:
- Han 7D/Han 8D connector/socket[2)3)]
10 Mounting flange according to EN 1092-1 or ASME B16.5
11 Clearance for turning the casing

[1)] Allow approx. 20 mm (0.79 inch) additional thread length
[2)] Not with type of protection "Explosion-proof"
[3)] Not with type of protection "FM + $_{C}$CSA$_{US}$ [IS + XP]"

SITRANS P pressure transmitter for filling level, P500 series, measurements in mm (inch)

Connection to EN 1092-1

Nominal diameter	Nominal pressure	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
DN50	PN 40	20	165	61	18	102	48.3	47[2]	2	125	4	0, 50, 100, 150 or 200
DN 80	PN 40	24	200	90	18	138	76	72[1]	2	160	8	
DN 100	PN 16	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

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M	f	k	n	L
	lb/sq.in.	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)	inch (mm)		inch (mm)
2 inch	Class 150	0.77 (19.5)	5.91 (150)	0.75(19.0)	3.62(92)	1.9(48.3)	2.32(59.0)	0.079 (2.0)	4.75 (120.7)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	Class 300	0.89 (22.7)	6.49(165)	0.75(19.0)	3.62(92)	1.9(48.3)	2.32(59.0)	0.079 (2.0)	5.0 (127)	8	
3 inch	Class 150	0.96 (24.3)	7.5 (190.5)	0.75 (19.0)	5 (127)	3.0 (76)	2.83[1] (72)	0.079 (2.0)	6 (152.4)	4	
	Class 300	1.14 (29.0)	8.27 (210)	0.87 (22.2)	5 (127)	3.0 (76)	2.83[1] (72)	0.079 (2.0)	6.69 (168.3)	8	
4 inch	Class 150	0.96 (24.3)	9.06 (230)	0.75 (19.0)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.079 (2.0)	7.5 (190.5)	8	
	Class 300	1.27 (32.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.5 (89)	0.079 (2.0)	7.88 (200)	8	

Explanations of tables:

d: Internal diameter of gasket to DIN 2690

d_M: Effective diaphragm diameter

d_5: Diameter of extension

f: Milling edge

L: Extension length

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

2) 59 mm with tube length L=0.

SITRANS P500 - Accessories/Spare parts

Selection and Ordering data			Order No.				
Replacement measuring cells for differential pressure		D)	**7MF5994-**				
SITRANS P pressure transmitters for differential pressure and flow, P500 HART PN 160 series (MAWP 2320 psi)							**1**
Measuring cell filling	**Measuring cell cleaning**						
Silicone oil	normal		**1**				
Measuring span (min. ... max.)							
1.25 ... 250 mbar	(0.5 ... 100.4 inH_2O)			**D**			
6.25 ... 1250 mbar	(2.5 ... 502 inH_2O)			**E**			
Wetted parts materials							
(stainless steel process flanges)							
Seal diaphragm	Parts of measuring cell						
stainless steel	stainless steel				**A**		
Hastelloy	stainless steel				**B**		
Monel	stainless steel				**C**		
Process connection							
Female thread ¼-18 NPT							
• Sealing screw opposite process connection							
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518						**0**	
- Mounting thread M10 to DIN 19213						**1**	
• Vent on side of process flange							
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518						**4**	
- Mounting thread M10 to DIN 19213						**5**	
Further designs			Order code				
Add "-Z" to Order No. and specify Order Code.							
Acceptance test certificate			**C12**				
Acc. to EN 10204-3.1							
Without process flanges			**K00**				
Vent on side for gas measurements[1)]			**L32**				
Process flanges, O-ring, special material Standard: Viton (FKM (FPM))							
Process connection sealing rings made of PTFE (Teflon), virginal			**L60**				
Process connection sealing rings made of PTFE (Teflon), glass fiber-reinforced			**L61**				
Process connection sealing rings made of FFPM (Kalrez)			**L62**				
Process flanges, O-rings made of NBR			**L63**				

1) Only in conjunction with process connection code 4 or 5.

D) Subject to export regulations AL: N, ECCN: EAR99H.

Selection and Ordering data

		Order No.
Mounting brackets		
For differential pressure transmitters with flange thread M10 (7MF54..-…10 and 7MF54..-…50)		
• made of steel		**7MF5987-1AA**
• made of stainless steel		**7MF5987-1AD**
Mounting brackets		
For differential pressure transmitter with flange thread 7/16-20 UNF (7MF54..-…00 and 7MF54..-…40)		
• made of steel		**7MF5987-1AC**
• made of stainless steel		**7MF5987-1AF**
Cover		
Made of die-cast aluminum, including O-ring		
• without window		**7MF5987-1BE**
• with window		**7MF5987-1BF**
Digital indicator Including mounting material		**7MF5987-1BR**
TAG plate (incl. fastening material)		
without inscription (5 pcs.)	C)	**7MF5987-1CA**
Printed (1 pc.) Data according to Y01 or Y02, Y15 and Y16 (see "SITRANS P transmitters")	C)	**7MF5987-1CB-Z Y..: .....**
Mounting screws		
For TAG plate, grounding and connection terminals and securing and locking screws (30 units)	C)	**7MF5987-1CC**
Sealing plugs for process flange (1 set = 2 units)		
• made of stainless steel		**7MF4997-1CG**
• made of Hastelloy		**7MF4997-1CH**
Vent valve Complete (1 set = 2 units)		
• made of stainless steel		**7MF4997-1CP**
• made of Hastelloy		**7MF4997-1CQ**
Electronics module		
HART, intrinsically safe Ex ia for installation in transmitter casing (observe warranty conditions)	C)	**7MF5987-1DC**
Connection board (incl. fastening material)		
HART, intrinsically safe Ex ia for installation in transmitter casing (observe warranty conditions)		**7MF5987-1DM**
O-rings for process flanges made of:		
• Viton (FKM (FPM)) (10 pcs.)	F)	**7MF5987-2DA**
• NBR (Buna N) (10 pcs.)	F)	**7MF5987-2DE**
Push buttons assembly (incl. fastening material)		**7MF5987-2AF**
For replacement of operating keys for on-site operation of the transmitter		
Sealing ring for		
• Process connection		**See catalog FI01, "Fittings"**
• NBR sealing ring for screw cover (10 pcs.)		**7MF4997-2EA**
• NBR sealing ring for interface measuring cell/housing (10 pcs.)	F)	**7MF5987-2EB**

Selection and Ordering data

	Order No.
Operating Instructions[1]	
German	**A5E02344527**
English	**A5E02344528**
French	**A5E02344529**
Italian	**A5E02344530**
Spanish	**A5E02344531**
Compact operating instructions[1]	
English, German, Spanish, French, Italian, Dutch	**A5E02344532**
English, Estonian, Latviaan, Lithuanian, Polish, Romanian	**A5E02307339**
English, Bulgarian, Czech, Finnish, Slovakian, Slovenian	**A5E02307340**
English, Danish, Greek, Portuguese, Swedish, Hungarian	**A5E02307341**
Russian	**A5E02307338**
Brief instructions (Leporello)	
German, English	**A5E02344536**
French, English	**A5E02344537**
Italian, English	**A5E02344538**
Spanish, English	**A5E02344539**
Chinese, English	**A5E02344540**
Russian, English	**A5E02556625**
CD with documentation	
German, English, French, Spanish, Italian	**A5E02344535**
Service Instructions[1] for replacement of electronics, measuring cell and terminal board	
• german	**A5E02822443**
• english	**A5E02344534**
HART modem	
• with RS232 interface D)	**7MF4997-1DA**
• with USB interface D)	**7MF4997-1DB**
Supplementary electronics for 4-wire connection	**A5E00322799**
Certificates (order only via SAP) additional to internet download	
• hard copy (to order)	**A5E03252406**
• on CD (to order)	**A5E03252407**

[1] You can download these operating instructions free-of-charge from our Internet site at www.siemens.com/sitransp.

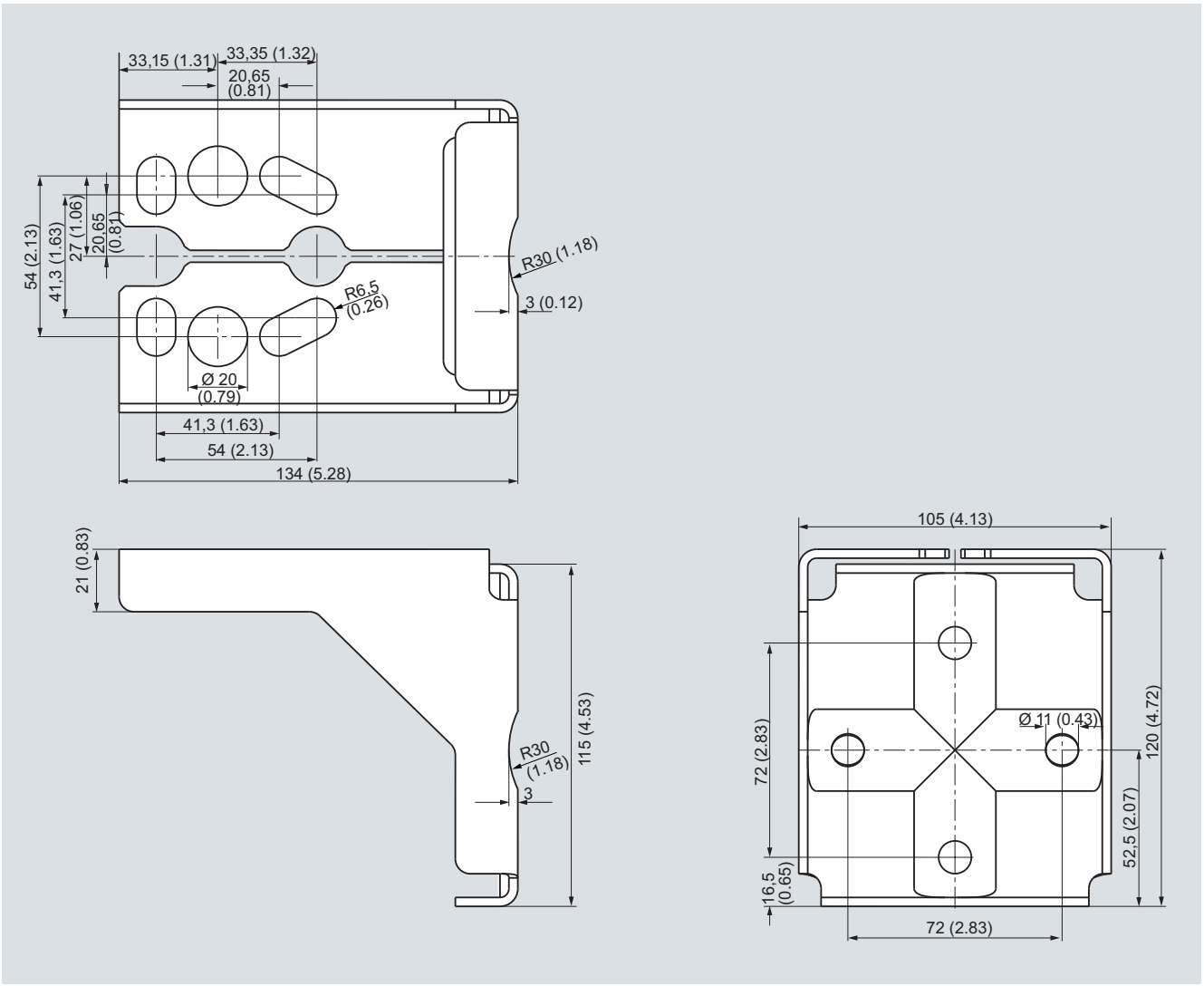
C) Subject to export regulations AL: N, ECCN: EAR99.

D) Subject to export regulations AL: N, ECCN: EAR99H.

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

For power supply units, see catalog FI01 "Supplementary Compontents".

Dimensional drawings



Mounting bracket for SITRANS P pressure transmitter, P500 series, measurements in mm (inch)
Mounting bracket material: Sheet-steel Mat. No. 1.0330, chrome-plated, or stainless steel Mat. No. 1.4301 (304)

Overview

The SITRANS P500 transmitter can be delivered factory-fitted with the following manifolds:

- Valve manifolds 7MF9411-5BA: Three valve manifold for differential pressure transmitter
- Valve manifolds 7MF9411-5CA: Three valve manifold for differential pressure transmitter

Design

The 7MF9411-5BA and 7MF9411-5CA manifolds are sealed with PTFE sealing rings between the transmitter and the manifold.

Once installed, the complete unit is checked under pressure for leaks (compressed air 6 bar (2411 inH_2O)) and is certified leak-proof with a factory certificate to EN 10204 - 2.2.

All manifolds should preferably be secured with the respective mounting brackets. The transmitters are mounted on the manifold and not on the unit itself.

If you order a mounting bracket when choosing the option "Factory mounting of manifolds", you will receive a mounting bracket for the manifold instead of a bracket for mounting the transmitter.

If you order an acceptance test certificate 3.1 to EN10204 when choosing the option "Factory mounting of manifolds", a separate certificate is provided for the transmitters and the manifolds respectively.

Selection and Ordering Data

Manifold 7MF9411-5BA on SITRANS P pressure transmitter P500 for differential pressure and flow

Add -Z to the Order No. of the transmitter and add order codes	Order Code
SITRANS P500 7MF54..-...	
mounted with gaskets made of PTFE and screws made of	
• chromized steel	**U01**
• stainless steel	**U02**
Delivery incl. high-pressure test certified by factory certificate to EN10204-2.2	
Further designs:	
Delivery includes mounting bracket and mounting clips made of	
• steel	**A01**
• stainless steel	**A02**
(instead of the mounting bracket supplied with the transmitter)	
Supplied acceptance test certificate to EN10204-3.1 for transmitters and mounted valve manifold	**C12**

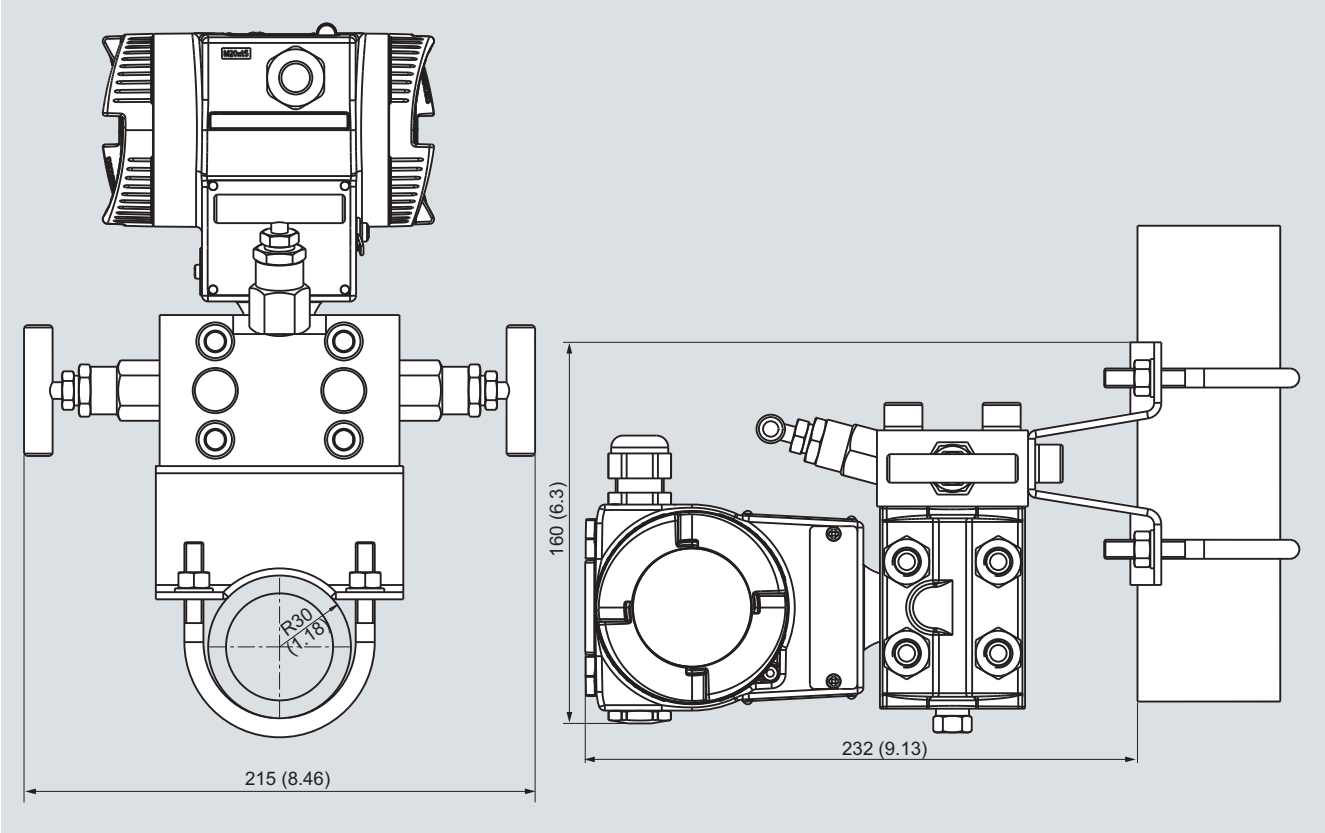
Manifold 7MF9411-5CA on SITRANS P500 pressure transmitter for differential pressure and flow

Add -Z to the Order No. of the transmitter and add order codes	Order Code
SITRANS P500 7MF54..-...	
mounted with gaskets made of PTFE and screws made of	
• chromized steel	**U03**
• stainless steel	**U04**
Delivery incl. high-pressure test certified by factory certificate to EN10204-2.2	
Further designs:	
Delivery includes mounting bracket and mounting clips made of	
• steel	**A01**
• stainless steel	**A02**
(instead of the mounting bracket supplied with the transmitter)	
Supplied acceptance test certificate to EN10204-3.1 for transmitters and mounted valve manifold	**C12**

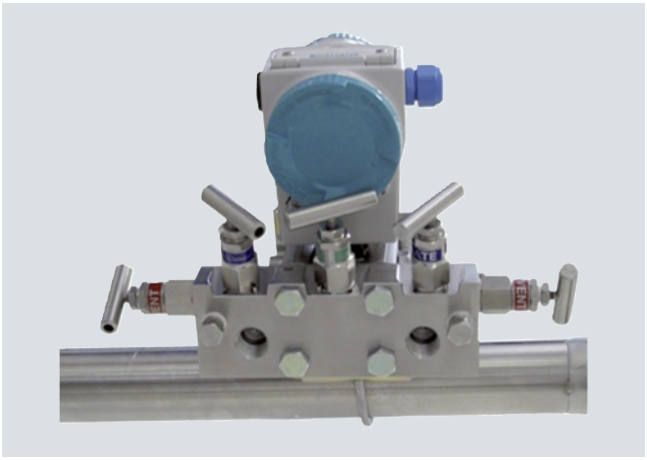
SITRANS P500 - Factory-mounting of valve manifolds on transmitters

Dimensional drawings

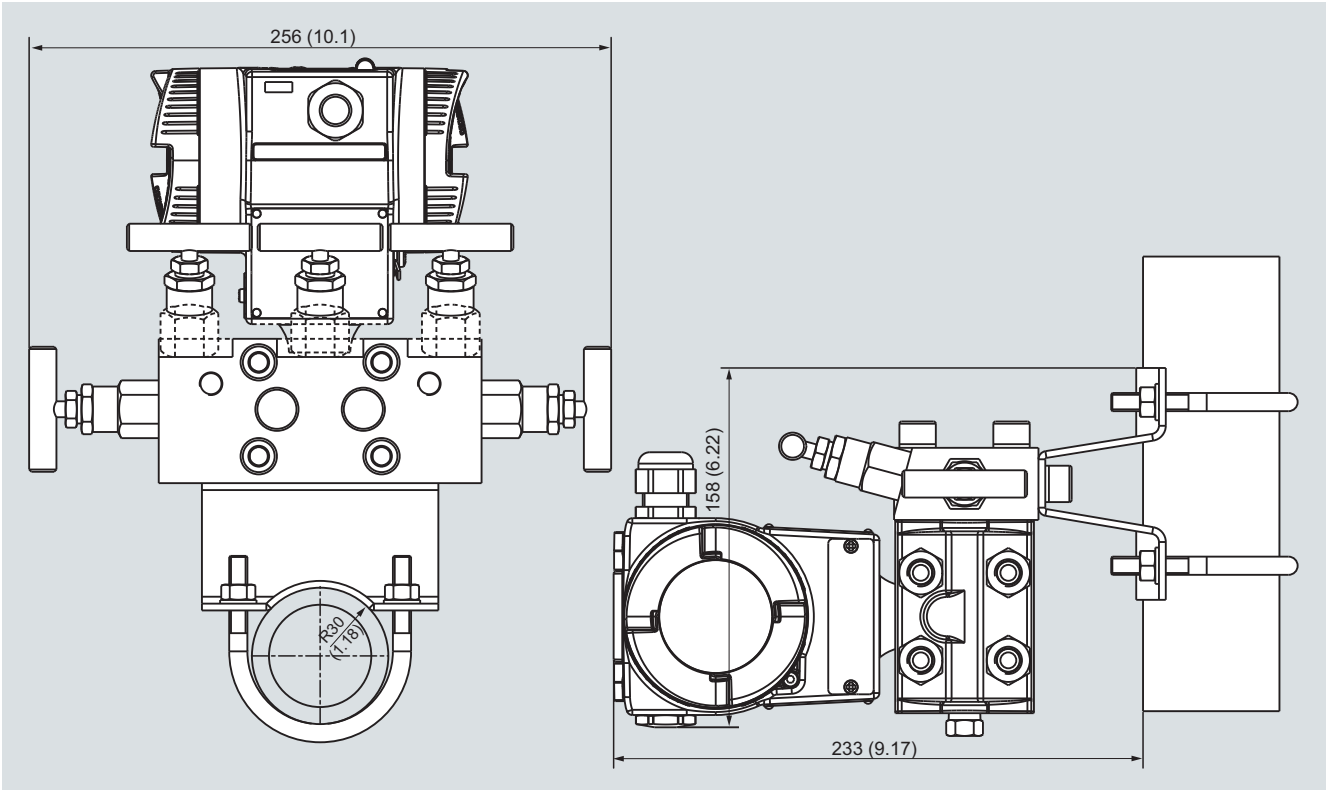
Manifold 7MF9411-5BA with attached SITRANS P500 pressure transmitter for differential pressure and flow (incl. mounting bracket)



Manifold 7MF9411-5BA with attached SITRANS P500 pressure transmitter for differential pressure and flow, measurements in mm (inch)



Manifold 7MF9411-5CA with attached SITRANS P500 pressure transmitter for differential pressure and flow (incl. mounting bracket)



Manifold 7MF9411-5CA with attached SITRANS P500 pressure transmitter for differential pressure and flow, measurements in mm (inch)

Technical description

Application

The remote seals 7MF48.. can be fitted to SITRANS P transmitters for

- ***pressure*** (7MF4033 and 7MF4034),
- ***absolute pressure*** (7MF4233, 7MF4234, 7MF4333, 7MF4334) and
- ***differential pressure and flow*** (7MF4433, 7F4434 and 7MF5403 and 7MF5413).

Design and mode of operation

A remote seal system consists of a transmitter, one or two remote seals, an appropriate transmission liquid, and a connection between the transmitter and remote seal (direct mounting or capillary).

The volume in contact with the measured medium is defined by an flexible diaphragm. The volume between this diaphragm and the pressure transmitter is completely filled with a transmission fluid. If a pressure is now applied to the remote seal, this is transmitted via the flexible diaphragm and the fill fluid to the pressure transmitter.

In many cases, a capillary is located between the remote seal and the pressure transmitter in order e.g. to minimize temperature effects from the hot medium on the latter. However, the capillary line influences the response time and the temperature response of the complete remote seal system. When fitting remote seals to differential pressure transmitters, two capillaries of the same length must always be used.

Fields of use

Remote seal systems should be used if a separation between the measured medium and the measuring instrument is appropriate or essential for the following reasons:

- The ***temperature of the medium*** is outside the limits specified for the transmitter.
- The medium is ***corrosive*** and requires diaphragm materials in the transmitter which are not available.
- The medium is ***highly viscous*** or ***contains solids*** which would block the measuring chambers of the transmitter.
- The medium may freeze in the measuring chambers or impulse line.
- The medium is ***heterogeneous*** and ***fibrous.***
- The medium tends towards polymerization or crystallization.
- The process requires ***quick-release*** remote seals, as necessary e.g. in the food industry for fast cleaning.
- The process requires cleaning of the measuring site, e.g. in a batch process.

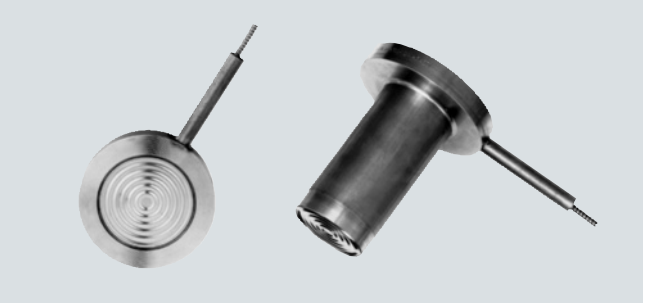
Constructional designs

A differentiation is made between diaphragm seals and inline seals.

With the diaphragm seals, the pressure is measured via a flat convoluted diaphragm welded to a convoluted backup.

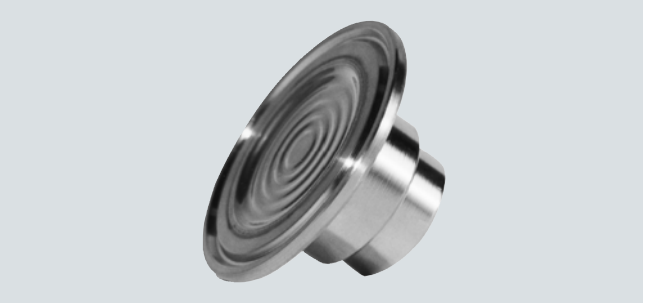
With the inline seals, the pressure is measured via a cylindrical diaphragm positioned in a pipe, and transmitted to the transmitter via the filling liquid.

The inline seal is a special design for flowing media. It consists of a cylindrical pipe in which a cylindrical diaphragm is embedded. Since it is completely integrated in the process pipe, no turbulences, dead volumes or other obstructions to the flow occur.



Diaphragm seal of pancake design, and also with extended diaphragm (extension)

Diaphragm seal of flush flange design, and also with extended diaphragm (extension)



Tri-Clamp sanitary remote seal

Diaphragm seals

The following types of diaphragm seals exist:

- Pancake design, and pancake design with extended diaphragm (extension) to DIN or ANSI which are secured using a backup blind flange.
- Flush flange design, and flange design with extended diaphragm (extension) to DIN or ANSI which are installed by using holes in the flange.
- Sanitary remote seals, e.g. to DIN 11851, Cherry Burrell, APC connection, Tri-clamp connection, etc.

The sanitary remote seals are common designs in the food industry. Their design means that the measured medium cannot accumulate in dead volumes. The sanitary clamp present on the remote seal means that quick dismounting is possible for cleaning.

- Button diaphragm seal with male thread for screwing into tapped holes.
- Remote seals with customer-specific process connections.

Clamp-on seals

The following types of clamp-on seals exist:

- Sanitary inline seals, e.g. to DIN 11851, Cherry Burrell, tri-clamp connection etc.
  The sanitary facility enables the seal to be removed quickly for cleaning purposes.
- Inline seals for positioning between DIN or ANSI flanges.
- Inline seals with customer-specific process connections.

Transmission response

Temperature errors occur if the fill fluid in the remote seal and in the capillaries expands or contracts as a result of temperature effects. The temperature error depends on the diaphragm charateristic, the influence of the fill fluid, and the influence of the fill fluid under the process flanges or in the flanges on the transmitter (volume minimized for remote seals).

Diaphragm characteristic
The charateristic of the remote seal is of great importance. The larger the diaphragm diameter, the softer it is. In comparison to a smaller diaphragm, this means that it can respond far easier to temperature-based expansions of the filling liquid.
The result is that low measuring ranges are only possible with large diaphragm diameters. In addition, the diaphragm thickness, its material, and any coatings which may be present must also be considered.

Fill fluid
All fill fluids expand or contract when the temperature varies. Temperature-independent errors can be minimized by selecting a suitable filling liquid, but it must also be ensured that the filling liquid is appropriate for the temperature limits and operating pressure. For food and beverage as well as pharmaceutical applications see reference for FDA approved fill fluids.

Since the fill fluid is present under the remote seal diaphragm, in the capillaries and under the process flanges of the transmitter, the temperature error must be calculated separately for each combination.

Response time
The response time depends on the internal diameter of the capillaries, the viscosity of the filling liquid, the capillary extension length, and the pressure in the measuring system:

Internal diameter:
The response time decreases as the internal diameter increases, but the temperature error increases due to increased oil volume.

Viscosity:
The response time increases as the viscosity increases.

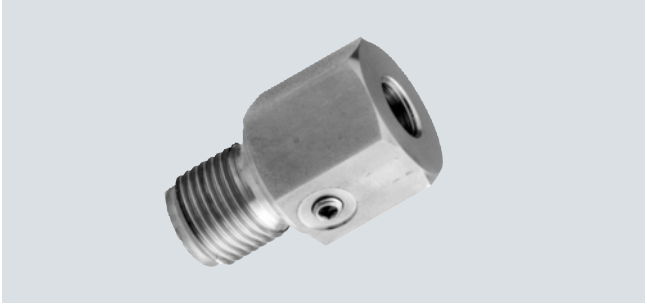
Capillary length:
The capillary length has a proportional effect on the response time and the temperature error.

Measuring system pressure:
The response time decreases as the pressure in the measuring system increases.

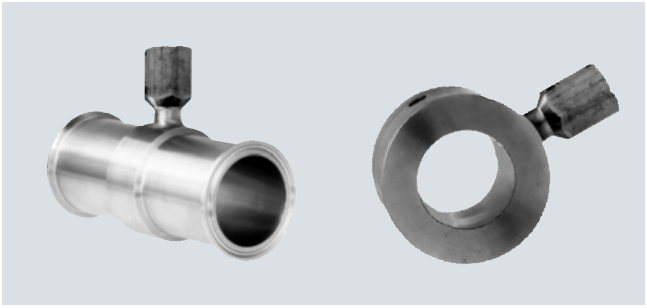
Recommendations

The following should be observed to obtain an optimum combination of transmitter and remote seal:

- The remote seal diameter, and thus the effective diameter of the diaphragm, should be selected as large as possible in order to keep the temperature-dependents errors as low as possible.
- The capillaries should be selected as short as possible in order to keep the response time and the temperature-dependent errors as low as possible.



Button diaphragm seal with diaphragm flush with front



Sanitary tri-clamp seal and for flange pancake mounting

- A filling liquid should be selected which has the lowest viscosity and the lowest coefficient of expansion, and which simultaneously fulfills the process requirements with respect to pressure/vacuum and temperature. The filling liquid must also be compatible with the process medium.
- When installing the equipment for vacuum applications, the transmitter must always be located below the lowest tap.
- It should also be noted that some of the filling liquids are very limited with respect to the permissible temperature of the medium for vacuum applications.
- When operating permanently at a vacuum, the remote seal must be designed in the version resistant to those vacuum applicaton.
- Recommendations on the minimum span can be found in the tables on pages 2/180 and 2/181.

Note

The remote seals listed in this catalog are a selection of the most common designs. As a result of the large variety of process connections, it may nevertheless be the case that certain remote seals which are not listed in the catalog are still available.

Other versions could be:

- Other process connections, standards
- Aseptic or sterile connections
- Other sizes
- Other nominal pressures
- Special diaphragm materials, including coatings
- Other sealing faces
- Other fill fluids
- Other capillary lengths
- Sheathing of capillaries with protective coat
- Calibration at higher/lower temperatures etc.

Please contact your Siemens Regional Office for more information.

Technical description

Technical data

Nominal diameter, nominal pressure, pressure connection	See Ordering data
Sealing face (only for pancake and flanged remote seals)	To ANSI B16.5 RF 250 RMS for stainless steel or solid materials or ANSI B16.5 RFSF (smooth finish) for other materials
Materials	
• Main body for pancake and flange remote seals	Stainless steel, mat. No. 1.4435/316L
• Wetted parts materials	See Ordering data
• Housing and diaphragm for Inline seals	Stainless steel, mat. No. 1.4435/316L or stainless steel, 7MF4880-... and 7MF4883-...
• Capillary	Stainless steel, mat. No. 1.4571/316Ti
• Armor	Spiral sheath made of stainless steel, mat. No. 304

Sealing material in the transmitter pressure flanges	
• For absolute pressure transmitters and vacuum applications	Copper
• For other applications	Viton
Max. pressure	See nominal pressure of remote seal and transmitter
Capillary	
• Length	Max. 30 ft. longer lengths on inquiry
• Internal bore	0.079 inch
• Smallest bending radius	6.0 inch
Fill fluid	
• For pancake and flange remote seals	See Ordering data
• For sanitary remote seals	Neobee M20 or glycerine/water
Ambient temperature	See transmitter and filling liquid
Certificates and approvals	
Classification according to pressure equipment directive (DGRL 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)

Measuring errors based on physical properties always result when using remote seals

Temperature errors of diaphragm seals when connected to pressure, absolute pressure or level transmitters, and with single-sided connection to differential pressure transmitters

	Nominal diameter/ design	Effective diaphragm diameter [in]	Temperature error of remote seal [inH_2O/25 °F]	Temperature error of capillary [inH_2O/25 °F/3 ft]	Temperature error of transmitter flange connection [inH_2O/25 °F]	Recommended values, min. spans (observe temperature error) [psi]
Flange to ANSI B16.5	2" flush flanged	2.32	1.69	2.04	2.04	7.5
	2" with extension	1.89	2.81	5.1	5.1	7.5
	3" flush flanged	3.5	0.23	0.21	0.21	1.5
	3" with extension	2.83	0.58	0.53	0.53	3.5
	4" flush flanged	3.5	0.23	0.21	0.21	1.5
	4" with extension	3.5	0.23	0.21	0.21	1.5
	5" flush flanged	4.88	0.12	0.07	0.07	0.3
	5" with extension	4.88	0.12	0.07	0.07	0.3
Flange to DIN 2501	DN 50 flush flanged	2.32	1.69	2.04	2.04	7.5
	DN 50 with extension	1.89	2.81	5.1	5.1	7.5
	DN 80 flush flanged	3.5	0.23	0.21	0.21	1.5
	DN 80 with extension	2.83	0.58	0.53	0.53	3.5
	DN 100 flush flanged	3.5	0.23	0.21	0.21	1.5
	DN 100 with extension	3.5	0.23	0.21	0.21	1.5
	DN 125 flush flanged	4.88	0.12	0.07	0.07	0.3
	DN 125 with extension	4.88	0.12	0.07	0.07	0.3
Sanitary Tri-Clamp	1 ½"	1.26	9.51	35.73	35.73	60
	2"	1.57	3.93	7.67	7.67	30
	2 ½"	2.32	1.69	2.57	2.57	7.5
	3"	2.83	0.58	0.53	0.53	3.5
	4"	3.5	0.23	0.21	0.21	1.5
Button Seal	1 NPT-male	0.98	13.97	81.7	81.7	90
	1 ½ NPT-male	1.57	3.93	7.67	7.67	30
	2" NPT-male	2.05	2.23	2.57	2.57	7.5

Temperature errors of diaphragm seals (part 1)

Remarks:

- Values apply to fill fluid: silicone oil DC 200, high-temperature oil, halocarbon oil and Neobee M20.
- Values apply to stainless steel as the diaphragm material.

Temperature errors of diaphragm seals with double-sided connection to differential pressure transmitters

	Nominal diameter/ design	Effective diaphragm diameter [in]	Temperature error of remote seal [inH_2O/25 °F]	Temperature error of capillary [inH_2O/25 °F/3 ft]	Temperature error of transmitter flange connection [inH_2O/25 °F]	Recommended values, min. spans (observe temperature error) [psi]
Flange to ANSI B16.5	2" flush flanged	2.32	0.384	0.42	0.42	3.5
	2" with extension	1.89	0.692	1.051	1.051	3.5
	3" flush flanged	3.5	0.077	0.042	0.042	1
	3" with extension	2.83	0.154	0.126	0.126	1.5
	4" flush flanged	3.5	0.077	0.042	0.042	1
	4" with extension	3.5	0.077	0.042	0.042	1
	5" flush flanged	4.88	0.038	0.017	0.017	0.3
	5" with extension	4.88	0.038	0.017	0.017	0.3
Flange to DIN 2501	DN 50 flush flanged	2.32	0.384	0.42	0.42	3.5
	DN 50 with extension	1.89	0.692	1.051	1.051	3.5
	DN 80 flush flanged	3.5	0.077	0.042	0.042	1
	DN 80 with extension	2.83	0.154	0.126	0.126	1.5
	DN 100 flush flanged	3.5	0.077	0.042	0.042	1
	DN 100 with extension	3.5	0.077	0.042	0.042	1
	DN 125 flush flanged	4.88	0.038	0.017	0.017	0.3
	DN 125 with extension	4.88	0.038	0.017	0.017	0.3
Sanitary Tri-Clamp	2"	1.57	0.961	1.849	1.849	30
	2 ½"	2.32	0.384	0.42	0.42	3.5
	3"	2.83	0.154	0.126	0.126	1.5
	4"	3.5	0.077	0.042	0.042	1

Temperature errors of diaphragm seals (part 2)

Remarks:

- Values apply to fill fluids: silicone oil DC 200, high-temperature oil, halocarbon oil and Neobee M20.
- Values apply to stainless steel as the diaphragm material.

Temperature errors of clamp-on seals when connected to pressure or absolute pressure transmitters, and with single-sided connection to differential pressure transmitters

Nominal diameter/design	Temperature error of remote seal [inH_2O/25 °F]	Temperature error of capillary [inH_2O/25 °F/3 ft]	Temperature error of transmitter flange connection [inH_2O/25 °F]	Recommended values, min. spans (observe temperature error) [psi]
1 inch	3.345	5.17	5.17	14.5
1 ½ inch	2.499	2.732	2.732	3.5
2 inch	2.23	1.849	1.849	1.5
3 inch	5.305	3.068	3.068	1.5
4 inch	0.461	1.849	1.849	1.5

Temperature errors of clamp-on seals with double-sided connection to differential pressure transmitters

Nominal diameter/design	Temperature error of remote seal [inH_2O/25 °F]	Temperature error of capillary [inH_2O/25 °F/3 ft]	Temperature error of transmitter flange connection [inH_2O/25 °F]	Recommended values, min. spans (observe temperature error) [psi]
1 inch	1.269	1.093	1.093	14.5
1 ½ inch	0.461	0.168	0.168	3.5
2 inch	0.154	0.084	0.084	1.5
3 inch	1.692	0.294	0.294	1.5
4 inch	0.577	0.084	0.084	1.5

Temperature errors of clamp-on seals

Remarks:

- Values apply to fill fluids: silicone oil DC 200, high-temperature oil, halocarbon oil and Neobee M20.
- Values apply to stainless steel as the diaphragm material.
- Diaphragm thickness: 1" & 1 ½" & 2":0.002 inch
  3" & 4": 0.004 inch

Technical description

Calculation of temperature error for remote seals

The following equation is used to calculate the temperature error for remote seals:

$$dp = (t_{RS} - t_{Cal}) \cdot f_{RS} + (t_{Cap} - t_{Cal}) \cdot l_{Cap} \cdot f_{Cap} + (t_{TR} - t_{Cal}) \cdot f_{PF}$$

dp	Additional temperature error (inH_2O)
t_{RS}	Temperature on remote seal diaphragm (generally corresponds to temperature of medium)
t_{Cal}	Reference (calibration) temperature 68 °F
f_{RS}	Temperature error of remote seal (see tables on pages 2/180 and 2/181)
t_{Cap}	Ambient temperature on the capillaries
l_{Cap}	Capillary extension length (error given per 3 ft)
f_{Cap}	Temperature error of capillaries (see tables on pages 2/180 and 2/181)
t_{TR}	Ambient temperature on transmitter
f_{PF}	Temperature error of oil filling in process flanges of transmitter (see tables on pages 2/180 and 2/181)

Example of calculation of temperature error for remote seals

Existing conditions:	
SITRANS P transmitter for differential pressure, 100 inH_2O, set to 0 to 40 inH_2O with 3 in flush flanged remote seal, diaphragm made of stainless steel, mat. No. 1.4535/316L	f_{RS} = 0.054 inH_2O/25 °F
Capillary 2 x 15 ft	l_{Cap} = 2 x 15 ft
Capillaries fitted on both sides	f_{Cap}= 0.042 inH_2O/25 °F/3 ft
Filled with silicone oil DC 200-10	f_{PF} = 0.042 inH_2O/25 °F
Temperature of medium 212 °F	t_{RS} = 212 °F
Temperature on capillaries 122 °F	t_{Cap} = 122 °F
Temperature on transmitter 122 °F	t_{TR} = 122 °F

Required:

Additional temperature error of remote seal: dp

Calculation:

dp = (212 °F – 68 °F) · 0.077 inH_2O/25 °F + (122 °F – 68 °F) · 15 ft · 2 · 0.042 inH_2O/25 °F / 3ft + (122 °F – 68 °F) · 0.042 inH_2O/25 °F

dp = 0.444 inH_2O + 0.907 inH_2O + 0.091 inH_2O

Result:

dp = 1.442 inH_2O (corresponds to 3.605 % of set span)

Note:

The temperature error determined above only applies to the error resulting from connection of the remote seal.

The transmission response of the respective transmitter is not included in this consideration. It must be calculated separately, and the resulting error added to the error determined above from connection of the remote seal.

Dependence of temperature error on diaphragm material

The errors listed in the tables on pages 2/180 and 2/181 refer to the use of stainless steel as the diaphragm material. If a different material is used, the listed values change by the amount shown in the following table.

Diaphragm material	Change in temperature error of remote seal
Stainless steel	Values as specified in tables on pages 2/180 and 2/181
Hastelloy C4, mat. No. 2.4610	Increase in values by 50%
Hastelloy C276, mat. No. 2.4819	Increase in values by 50%
Monel 400, mat. No. 2.4360	Increase in values by 60%
Tantalum	Increase in values by 50%
Titanium	Increase in values by 50%
Teflon lining on stainless steel diaphragm	Increase in values by 120%
Halar coating or PFA coating on stainless steel diaphragm	Increase in values by 100%
Gold coating on stainless steel diaphragm	Increase in values by 40%

Response times (approximate)

The listed values are the response times (in seconds, per meter of capillary extension) for a change in pressure which corresponds to the set span.

The listed values must be multiplied by the respective length of the capillary extension, or with transmitters for differential pressure and flow by the total length of both capillary extensions.

The response times are independent of the set span within the range of the respective transmitter. The response times are of insignificant importance for spans above 145 psi (10 bar). The response time of the transmitter has not been considered.

Filling liquid	Density		Temperature on capillary		Response time in s/m (s/ft) with max. span of transmitter					
	kg/dm³	(lb/in³)	°C	(°F)	250 mbar	(3.63 psi)	600 mbar	(8.7 psi)	1600 mbar	(23.2 psi)
Silicone oil DC 200-10	0.934	(0.033)	+60 +20 - 20	(140) (68) (-4)	0.06 0.11 0.3	(0.018) (0.034) (0.091)	0.02 0.02 0.12	(0.006) (0.006) (0.037)	0.01 0.02 0.05	(0.003) (0.006) (0.015)
Silicone oil DC 200-50	0.966	(0.035)	+60 +20 - 20	(140) (68) (-4)	0.6 0.61 1.69	(0.183) (0.186) (0.515)	0.25 0.26 0.71	(0.076) (0.079) (0.216)	0.09 0.1 0.27	(0.027) (0.030) (0.082)
Syltherm 800	0.935	(0.034)	+60 +20 - 20	(140) (68) (-4)	0.06 0.11 0.3	(0.018) (0.034) (0.091)	0.02 0.02 0.12	(0.006) (0.006) (0.37)	0.01 0.02 0.05	(0.003) (0.006) (0.015)
High-temperature oil	1.07	(0.039)	+60 +20 -10	(140) (68) (14)	0.14 0.65 3.96	(0.043) (0.198) (1.207)	0.06 0.27 1.65	(0.018) (0.082) (0.503)	0.02 0.1 0.62	(0.006) (0.030) (0.189)
Halocarbon oil	1.968	(0.071)	+60 +20 - 20	(140) (68) (68)	0.07 0.29 2.88	(0.021) (0.088) (0.878)	0.03 0.12 1.2	(0.009) (0.037) (0.366)	0.01 0.05 0.45	(0.003) (0.015) (0.137)
Fluorolube	1.866	(0.068)	+60 +20 - 20	(140) (68) (-4)	0.07 0.29 2.88	(0.021) (0.088) (0.878)	0.03 0.12 1.2	(0.009) (0.037) (0.366)	0.01 0.05 0.45	(0.003) (0.015) (0.137)
Neobee M20	0.917	(0.033)	+60 +20 - 20	(140) (68) (-4)	0.18 0.43 1.19	(0.055) (0.131) (0.363)	0.08 0.18 0.5	(0.024) (0.055) (0.152)	0.03 0.07 0.18	(0.009) (0.021) (0.055)
Glycerine/water	1.22	(0.044)	+60 +20 0	(140) (68) (32)	0.13 0.76 9.72	(0.040) (0.232) (2.963)	0.05 0.32 4.05	(0.015) (0.098) (12.34)	0.02 0.12 1.51	(0.006) (0.037) (0.460)
Medicinal white mineral oil (food grade)	0.92	(0.033)	+60 +20 - 20	(140) (68) (-4)	0.75 4 20	(0.229) (1.22) (6.1)	0.33 1.75 8.5	(0.101) (0.534) (2.593)	0.17 0.67 3.25	(0.052) (0.204) (0.991)

Technical data of filling liquid

When selecting the filling liquid, check that it is suitable with respect to the permissible temperature of the medium and the process pressure. Also check the compatibility with the measured medium. For example, only food grade filling liquids may be used in the food industry. A special case are oxygen and chlorine as the measured media; the fill fluid must not react with them, otherwise an explosion or fire may occur if there is a leak in the remote seal.

Filling liquid	Permissible temperature of medium				Density at 20 °C (68 °F)		Viscosity at 20 °C (68 °F)		Expansion coefficient	
	p_{abs}<1 bar	(p_{abs}<14.5 psi)	p_{abs}>1 bar	(p_{abs}>14.5 psi)	kg/dm³	(lb/in³)	m²/s·10⁶	(ft²/s·10⁶)	1/°C	(1/°F)
	°C	(°F)	°C	(°F)						
Silicone oil DC200-10	-40 to +121	(-40 to +248)	-40 to +200	(-40 to +392)	0.934	(0.03)	10	(107.6)	0.00108	(0.00060)
Silicone oil DC 200-50	-20 to +150	(-4 to +302)	-20 to +250	(-4 to +482)	0.96	(0.03)	50	(538)	0.00104	(0.00058)
Syltherm 800	-40 to +121	(-40 to +250)	-40 to +205	(-40 to +400)	0.935	(0.034)	10.03	(107.9)	0.00109	(0.00061)
High-temp. oil	-10 to +200	(+14 to +392)	-10 to +350	(+14 to +662)	1.07	(0.04)	39	(420)	0.0008	(0.00044)
Halocarbon oil	-40 to +80	(-40 to +176)	-40 to +175	(-40 to +347)	1.968	(0.07)	14	(151)	0.00086	(0.00048)
Fluorolube	Not possible	Not possible	-40 to +175	(-40 to +347)	1.866	(0.068)	15.5	(167)	0.000864	(0.00048)
Neobee M20	10 to +90	(+14 to +195)	-10 to +200	(+14 to +392)	0.917	(0.03)	9.8	(105)	0.00082	(0.00045)
Glycerine/water	Not possible	Not possible	-10 to +120	(+14 to +248)	1.22	(0.04)	88	(947)	0.0005	(0.00028)
Med. white mineral oil (food grade)	-20 ... +160	-4 ... +320	-20 to +200	(-4 to +392)	0.92	(0.03)	10	(107)	0.0008	(0.00044)

Maximum temperature of medium

The following maximum temperatures of the medium apply depending on the wetted parts materials:

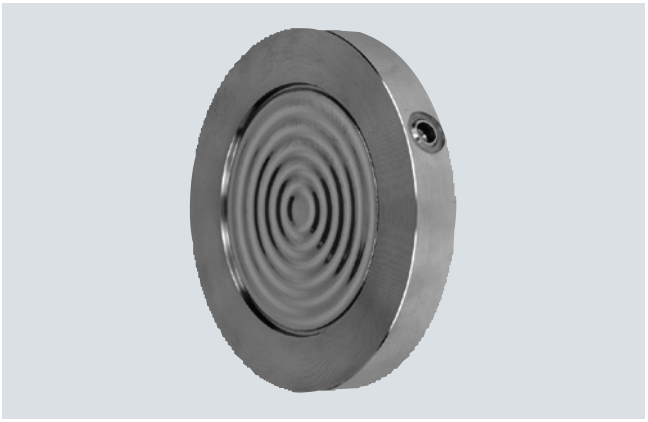
Material	p_{abs} < 1 bar (14.5 psi)		p_{abs} > 1 bar (14.5 psi)	
	°C	(°F)	°C	(°F)
Stainless steel, mat. No. 1.4571/316Ti	200	(392)	350	(662)
PTFE coating	100	(212)	150	(302)
ECTFE/PFA coating	100	(212)	150	(302)
Hastelloy C4, mat. No. 2.4610	200	(392)	350	(662)
Hastelloy C276, mat. No. 2.4819	200	(392)	350	(662)
Monel 400, mat. No. 2.4360	200	(392)	350	(662)
Tantalum	200	(392)	300	(572)

Maximum capillary length (guidance values for diaphragm seals and inline seals)

Nominal diameter		Max. length of capillary			
		Diaphragm seal		Inline seal	
DN 25	(1 inch)	2.5 m	(8.2 ft)	2.5 m	(8.2 ft)
DN 32	(1¼ inch)	2.5 m	(4.9 ft)	2.5 m	(8.2 ft)
DN 40	(1½ inch)	4 m	(13.1 ft)	6 m	(19.7 ft)
DN 50	(2 inch)	6 m	(19.7 ft)	10 m	(32.8 ft)
DN 65	(2½ inch)	8 m	(26.2 ft)	10 m	(32.8 ft)
DN 80	(3 inch)	10 m	(32.8 ft)	10 m	(32.8 ft)
Size	4 inch		(30.0 ft)	–	
Size	5 inch		(30.0 ft)	–	–

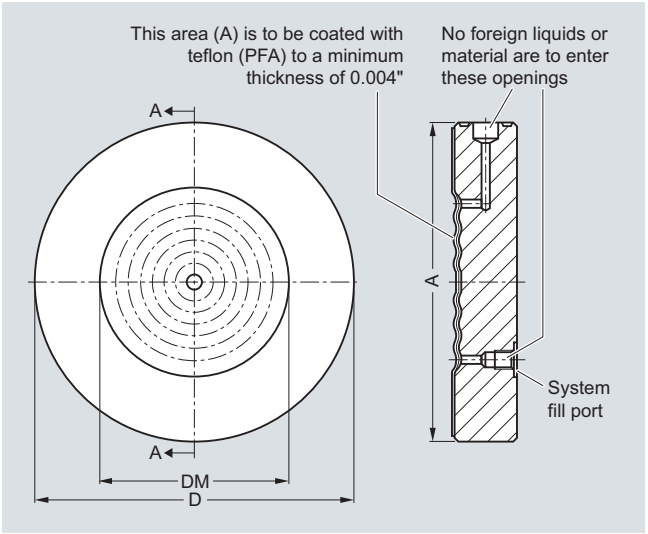
Pancake type diaphragm seal with flexible capillary tube

Overview



Pancake type diaphragm seal

Dimensions (Connection to ASME B16.5)



Pancake type diaphragm seal, dimensions

Size	Class	D	DM	F	A [in²]
2"	150 - 2500	3.94	2.32	0.79	12.2
3"		5.28	3.50	0.79	21.9
4"		6.22	3.50	0.79	30.4
5"		7.32	4.80	0.87	42.1

Size = Nominal pipe size
DM = Effective diaphragm diameter
Class = Flange rating per ASME B16.5
All dimensions in inches unless otherwise noted

Selection and Ordering data

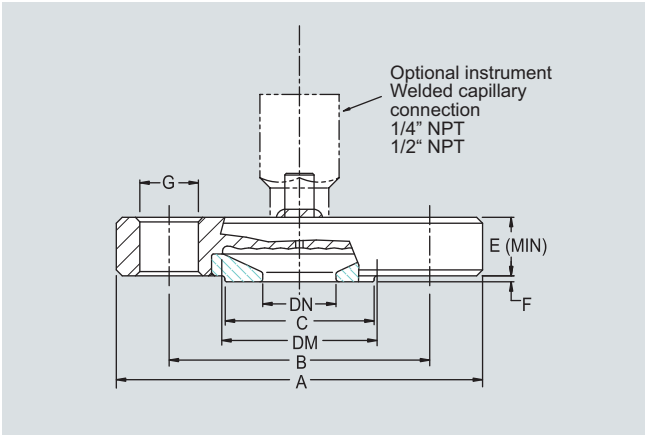
		Order No.	Order code
Pancake type diaphragm seal with flexible capillary extension, connected to a SITRANS P transmitter (order separately)			
for pressure 7MF40 ■■ or 7MF42 ■■	C)	7MF4800-	
for absolute pressure 7MF43 ■■	C)	7MF4801-	
for differential pressure 7MF44 ■■	C)	7MF4803-	
• dual seals for DP		1■■■■-■B	■■■
Size and class			
• 2 inch	class 150 ... 2500	E	
• 3 inch	class 150 ... 2500	H	
• 4 inch	class 150 ... 2500	L	
• 5 inch	class 150 ... 2500	N	
Special design, customer inform. to be supplied		Z	J1Y
Materials and wetted parts			
• SST 316L		A	
• SST 316L with carbon pigmented Teflon lined diaphragm (good upto 500 °F)		E0	
• Monel 400, mat. No. 2.4360		G	
• Hastelloy C276, mat. No. 2.4819		J	
• Tantal		K	
Special design, customer inform. to be supplied		Z	K1J
Extension length (316SS standard)			
Without extension (standard version)		0	
Special design, customer information to be supplied for extension		9	L1Y
System fill			
• Medicinal white mineral oil, FDA approved		0	
• Silicone oil DC 200-10		1	
• Silicone oil DC 200-50		2	
• High temperature oil		3	
• Halocarbon (for O_2-application)		4	
• Silicone oil M5		5	
• Syltherm 800		6	
• DC704 silicone oil		7	
• Fluorolube		8	
Special design, customer inform. to be supplied		9	M1Y
Length of capillary			
• 3 ft		2	
• 5 ft		3	
• 10 ft		4	
• 15 ft		5	
• 20 ft		6	
• 25 ft		7	
• 30 ft		8	
Special design, customer inform. to be supplied		9	N1Y
Further designs Please add **„-Z“** to Order No. and specifiy Order code			
for 7MF4800			
Integrated flame path restriction			A01
Certificate of calibration N.I.S.T. (20% steps)			C11
Material conformance certificate			C12
Vacuum service (must be specified with HT oil)			V01
Calculation of span of transmitter (completed questionnaire to be attached)			Y05
for 7MF4801			
Integrated flame path restriction			A01
Certificate of calibration N.I.S.T. (20% steps)			C11
Material conformance certificate			C12
Calculation of span of transmitter (completed questionnaire to be attached)			Y05
for 7MF4803			
Integrated flame path restriction			A02
Certificate of calibration N.I.S.T. (20% steps)			C11
Material conformance certificate			C12
Vacuum service (must be specified with HT oil)			V03
Calculation of span of transmitter (completed questionnaire to be attached)			Y05

C) Subject to export regulations AL: N, ECCN: EAR99.

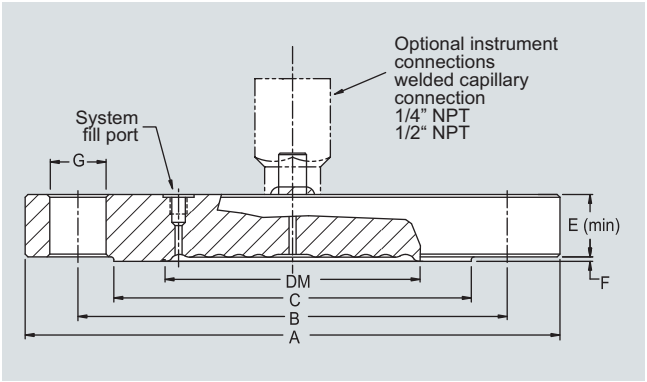
Overview

Flange-type diaphragm seal, without extension

Dimensions (connection to ASME B16.5)



Flange-type diaphragm seal without extension for flanges ≤ 1"



Flange-type diaphragm seal without extension for flanges ≥ 1.5"

Size DN	Class	A	B	C	DM	E	F	G	X	Weight lbs
½"	150	3.50	2.38	1.38	1.3	0.85	0.06	0.62	4	2.2
	300	3.75	2.62	1.38	1.6	0.85	0.06	0.62	4	2.2
¾"	150	3.88	2.75	1.69	1.6	0.85	0.06	0.62	4	2.4
	300	4.62	3.25	1.69	1.6	0.85	0.06	0.75	4	3.5
1"	150	4.25	3.12	2.00	2.1	0.85	0.06	0.62	4	3.1
	300	4.88	3.50	2.00	2.1	0.85	0.06	0.75	4	3.7
1.5"	150	5.00	3.55	2.88	1.9	0.69	0.06	0.62	4	3.5
	300	6.12	4.50	2.88	1.9	0.81	0.06	0.88	4	5.5
	600	6.12	4.50	2.88	1.9	1.13	0.25	0.88	4	7.3
	1500	7.00	4.88	2.88	1.9	1.50	0.25	1.12	4	13.0
	2500	8.00	5.75	2.88	1.9	2.00	0.25	1.25	4	22.9
2"	150	6.00	4.75	3.62	2.4	0.75	0.06	0.75	4	5.9
	300	6.50	5.00	3.62	2.4	0.88	0.06	0.75	8	8.1
	600	6.50	5.00	3.62	2.4	1.25	0.25	0.75	8	12.5
	1500	8.50	6.50	3.62	2.4	1.75	0.25	1.00	8	29.0
	2500	9.25	6.75	3.62	2.4	2.25	0.25	1.12	8	43.6
3"	150	7.50	6.00	5.00	3.5	0.94	0.06	0.75	4	11.7
	300	8.25	6.62	5.00	3.5	1.12	0.06	0.88	8	17.2
	600	8.25	6.62	5.00	3.5	1.50	0.25	0.88	8	24.2
	900	9.50	7.50	5.00	3.5	1.75	0.25	1.00	8	36.7
	1500	10.53	8.00	5.00	3.5	2.13	0.25	1.25	8	53.9
	2500	12.01	9.00	5.00	3.5	2.87	0.25	1.38	8	93.9
4"	150	9.00	7.50	6.19	3.5	0.94	0.06	0.75	8	16.9
	300	10.04	7.88	6.19	3.5	1.25	0.06	0.88	8	27.9
	400	10.4	7.88	6.19	3.5	1.63	0.25	1.00	8	38.3
	600	10.83	8.50	6.19	3.5	1.75	0.25	1.00	8	47.3
	900	11.51	9.25	6.19	3.5	2.00	0.25	1.25	8	60.9
	1500	12.30	9.50	6.19	3.5	2.37	0.25	1.38	8	81.4
	2500	14.00	10.75	6.19	3.5	3.25	0.25	1.62	8	144.5

DN = Nominal pipe size
DM = Effective diaphragm diameter
Class = Flange rating per ASME B16.5
X = Number of bolt holes
All dimensions in inches unless otherwise noted

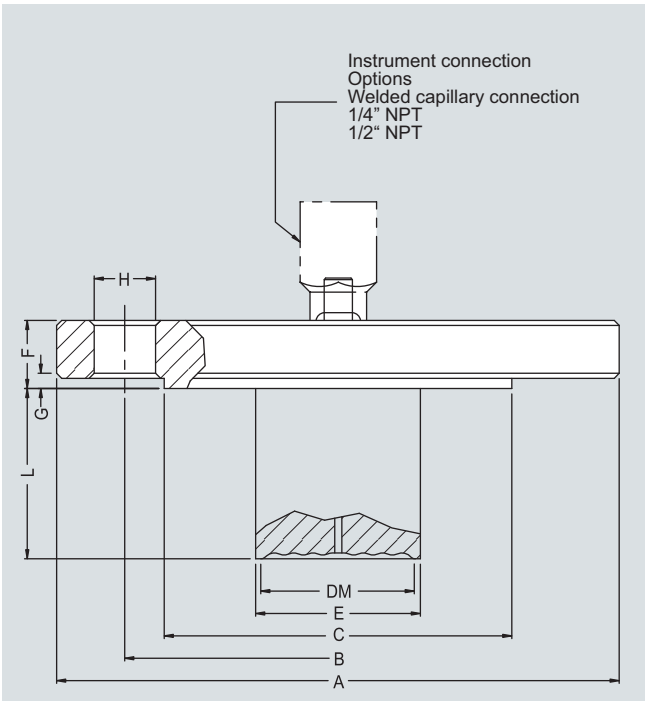
Flange-type diaphragm seal, without extension, dimensions

Flange-type diaphragm seal with extension

Overview

Flange-type diaphragm seal, with extension

Dimensions



Size DN	Class	A	B	C	DM	E[1)]	F	G	H	X	L			
2"	150	6.00	4.75	3.62	1.8	1.90	0.75	0.06	0.75	4	2.0	3.0	4.0	6.0
	300	6.50	5.00				0.88		0.75	8				
3"	150	7.50	6.00	5.00	2.8	2.99	0.94		0.75	4				
	300	8.25	6.62				1.12		0.88	8				
4"	150	9.00	7.50	6.19	3.5	3.70	0.94		0.75	8				
	300	10.04	7.88				1.25		0.88	8				

[1)] based on schedule 40

DN = Nominal pipe size
DM = Effective diaphragm diameter
Class = Flange rating per ASME B16.5
X = Number of bolt holes
All dimensions in inches unless otherwise noted

Flange-type diaphragm seal, with extension, dimensions

Selection and Ordering data

	Order No.	Order code
Flange-type diaphragm seal		
directly connected to a SITRANS P 7MF40 ■■ or 7MF42 ■■ (order separately)	C) 7MF4810-	■■■■■ ■■■
Process connection		
vertical (transmitter upright)	0	
horizontal	2	
Size and class		
• 2 inch class 150	L	
• 2 inch class 300	M	
• 2 inch class 600	N	
• 2 inch class 1500	P	
• 3 inch class 150	Q	
• 3 inch class 300	R	
• 3 inch class 600	S	
• 4 inch class 150	T	
• 4 inch class 300	U	
• 4 inch class 400	V	
Special design, customer information to be supplied	Z	J 1 Y
Materials and wetted parts		
• SST 316L	A	
• SST 316L with carbon pigmented Teflon lined diaphragm (good upto 500 °F)	E 0	
• Monel 400, mat. No. 2.4360	G	
• Hastelloy C276, mat. No. 2.4819	J	
• Tantal	K	
Special design, customer information to be supplied	Z	K 1 Y
Extension length (316SS standard)		
Without extension (standard version)	0	
2"	1	
4"	2	
6"	3	
8"	4	
Special design, customer information to be supplied for extension	9	L 1 Y
System fill		
• Medicinal white mineral oil, FDA approved	0	
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• High temperature oil	3	
• Halocarbon (for O_2-application)	4	
• Silicone oil M5	5	
• Sylltherm 800	6	
• DC704 silicone oil	7	
• Fluorolube	8	
Special design, customer information to be supplied	9	M 1 Y
Further designs Please add **„-Z"** to Order No. and specifiy Order code		
Integrated flame path restriction		A 0 1
Rotatable Flange		B 0 1
Certification of calibration N.I.S.T. (20% steps)		C 1 1
Material conformance certificate		C 1 2
Vacuum service (must be specified with HT oil)		V 0 1
Calculation of span of transmitter (completed questionnaire to be attached)		Y 0 5

C) Subject to export regulations AL: N, ECCN: EAR99.

Selection and Ordering data			Order No.	Order code
Mounting flange				
directly mounted at SITRANS P for Level 7MF46 ■ ■ (order separately)			C) 7MF4812-	
			3■■■■	■■■
Flange	Size	Class		
ANSI B16.5	2 inch	150	L	
		300	M	
	3 inch	150	Q	
		300	R	
	4 inch	150	T	
		300	U	
Special design, customer information to be supplied			Z	J 1 Y
Materials and wetted parts				
• SST 316L			A	
• SST 316L with carbon pigmented Teflon lined diaphragm (good upto 500 °F)			E 0	
• Monel 400, mat. No. 2.4360			G	
• Hastelloy C276, mat. No. 2.4819			J	
• Tantal			K	
Special design, customer information to be supplied			Z	K 1 Y
Extension length (316SS standard)				
Without extension (standard version, 0 mm)			0	
2"	50 mm		1	
4"	100 mm		2	
6"	150 mm		3	
8"	200 mm		4	
Special design, customer information to be supplied for extension			9	L 1 Y
System fill				
• Medicinal white mineral oil, FDA approved			0	
• Silicone oil DC 200-10			1	
• Silicone oil DC 200-50			2	
• High temperature oil			3	
• Halocarbon (for O_2-application)			4	
• Silicone oil M5			5	
• Syltherm 800			6	
• DC704 silicone oil			7	
• Fluorolube			8	
Special design, customer information to be supplied			9	M 1 Y
Further designs Please add „-Z“ to Order No. and specifiy Order code				
Integrated flame path restriction				A 0 1
Rotatable Flange				B 0 1
Certificates: Certification of calibration N.I.S.T. (20% steps)				C 1 1
Material conformance certificate				C 1 2
Vacuum service (must be specified with HT oil)				V 0 4
Calculation of span of transmitter (completed questionnaire to be attached)				Y 0 5

C) Subject to export regulations AL: N, ECCN: EAR99.

Selection and Ordering data			Order No.	Order code
Mounting flange at High-Side, Flange-Type Seal, w/o extension Flange-type seal via capillary extension on low-side without extension				
for SITRANS P for differential pressure 7MF44 ■ ■ (order separately)			C) 7MF4813-	
			1■■■■-■B	■■■
Flange	Size	Class		
ANSI B16.5	2 inch	150	L	
		300	M	
	3 inch	150	Q	
		300	R	
	4 inch	150	T	
		300	U	
Special design, customer information to be supplied			Z	J 1 Y
Materials and wetted parts				
• SST 316L			A	
• SST 316L with carbon pigmented Teflon lined diaphragm (good upto 500 °F)			E	
• Monel 400, mat. No. 2.4360			G	
• Hastelloy C276, mat. No. 2.4819			J	
• Tantal			K	
Special design, customer information to be supplied			Z	K 1 Y
Extension length (316SS standard)				
Without extension (standard version, 0 mm)			0	
2"	50 mm		1	
4"	100 mm		2	
6"	150 mm		3	
8"	200 mm		4	
Special design, customer information to be supplied for extension			9	L 1 Y
System fill				
• Medicinal white mineral oil, FDA approved			0	
• Silicone oil DC 200-10			1	
• Silicone oil DC 200-50			2	
• High temperature oil			3	
• Halocarbon (for O_2-application)			4	
• Silicone oil M5			5	
• Syltherm 800			6	
• DC704 silicone oil			7	
• Fluorolube			8	
Special design, customer information to be supplied			9	M 1 Y
Capillary length at low-side				
• 3 ft			2	
• 5 ft			3	
• 10 ft			4	
• 15 ft			5	
• 20 ft			6	
• 25 ft			7	
• 30 ft			8	
Special design, customer information to be supplied			9	
Further designs Please add **„-Z“** to Order No. and specifiy Order code				
Integrated flame path restriction				A 0 2
Rotatable Flange				B 0 1
Certification of calibration N.I.S.T. (20% steps)				C 1 1
Material conformance certificate				C 1 2
Vacuum service (must be specified with HT oil)				V 0 4
Calculation of span of transmitter (completed questionnaire to be attached)				Y 0 5

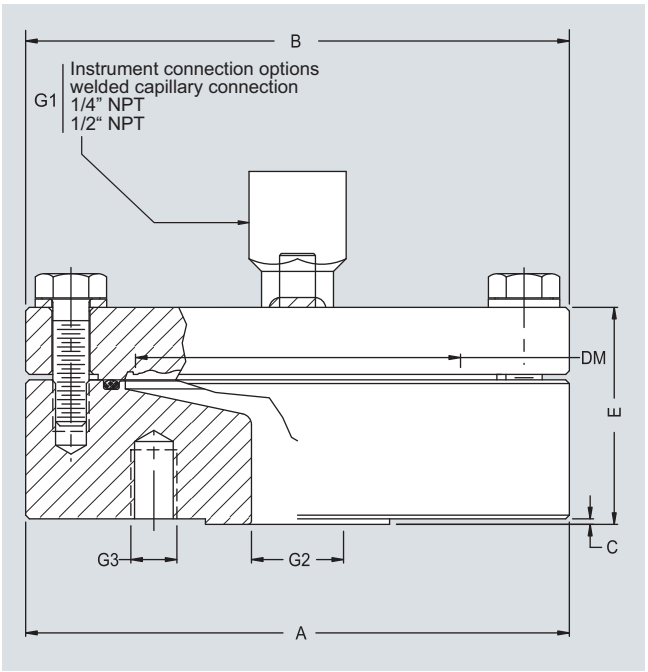
C) Subject to export regulations AL: N, ECCN: EAR99.

Diaphragm seal "flanged off-line low-pressure type", directly connected

Overview

Diaphragm seal "flanges off-line low-pressure type"

Dimensions (Connection to ASME B16.5)



G2		G3	X	A	B	C	DM	E
Size	Class							
½"	150#	½"-13UNC	4	5.91		0.06		2.36
½"	300#	½"-13UNC	4	5.91		0.06		2.36
½"	600#	½"-13UNC	4	5.91		0.25		2.55
¾"	150#	½"-13UNC	4	5.91		0.06		2.36
¾"	300#	5/8"-11UNC	4	5.91		0.06		2.36
¾"	600#	5/8"-11UNC	4	5.91		0.25		2.55
1"	150#	½"-13UNC	4	5.91		0.06		2.36
1"	300#	5/8"-11UNC	4	5.91	5.91	0.06	3.5	2.36
1"	600#	5/8"-11UNC	4	5.91		0.25		2.55
1 ½"	150#	½"-13UNC	4	5.91		0.06		2.36
1 ½"	300#	¾"-10UNC	4	6.12		0.06		2.46
1 ½"	600#	¾"-10UNC	4	6.12		0.25		2.65
2"	150#	5/8"-11UNC	4	6.00		0.06		2.36
2"	300#	5/8"-11UNC	8	6.50		0.06		2.36
2"	600#	5/8"-11UNC	8	6.50		0.25		2.55

DM = Effective diaphragm diameter
G1 = Instrument connection
G2 = Process connection
G3 = Threaded bolt hole
X = Number of bolt holes
Class = Flange rating per ASME B16.5
Size = Nominal pipe size
All dimensions in inches unless otherwise noted

Selection and Ordering data	Order No.	Order code
Diaphragm seal "flanged off-line low-pressure type"		
direct mount to transmitter, 316 stainless steel C) upper housing SITRANS P for 7MF44 ■■ or 7MF46 ■■ (order separately)	7MF4814- 3■■■■	■■■
Size and class		
• ½ inch class 150#RF	A	
• ½ inch class 300#RF	B	
• ½ inch class 600#RF	C	
• ¾ inch class 150#RF	E	
• ¾ inch class 300#RF	F	
• ¾ inch class 600#RF	G	
• 1 inch class 150#RF	J	
• 1 inch class 300#RF	K	
• 1 inch class 600#RF	L	
• 1 ½ inch class 150#RF	N	
• 1 ½ inch class 300#RF	P	
• 1 ½ inch class 600#RF	Q	
• 2 inch class 150#RF	S	
• 2 inch class 300#RF	T	
• 2 inch class 600#RF	U	
Special design, customer information to be supplied	Z	J 1 Y
Materials and wetted parts		
• SST 316L	A	
• SST 316L with carbon pigmented Teflon lined diaphragm (good upto 500 °F)	E	
• Monel 400, mat. No. 2.4360	G	
• Hastelloy C276, mat. No. 2.4819	J	
• Tantal	K	
Special design, customer information to be supplied	Z	K 1 Y
Flushing port(s)		
None	0	
1 x ¼"NPT-female (available w/ SS, HC or MO)	2	
2 x ¼"NPT-female (available w/ SS, HC or MO)	4	
Special design, customer information to be supplied	9	L 1 Y
System fill		
• Medicinal white mineral oil, FDA approved	0	
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• High temperature oil	3	
• Halocarbon (for O_2-application)	4	
• Silicone oil M5	5	
• Sylltherm 800	6	
• DC704 silicone oil	7	
• Fluorolube	8	
Special design, customer information to be supplied	9	M 1 Y
Further designs Please add **„-Z“** to Order No. and specifiy Order code		
Integrated flame path restriction		A 0 1
Certification of calibration N.I.S.T. (20 % steps)		C 1 1
Material conformance certificate		C 1 2
Vacuum service (must be specified with HT oil)		V 0 1
Calculation of span of transmitter (completed questionnaire to be attached)		Y 0 5

C) Subject to export regulations AL: N, ECCN: EAR99.

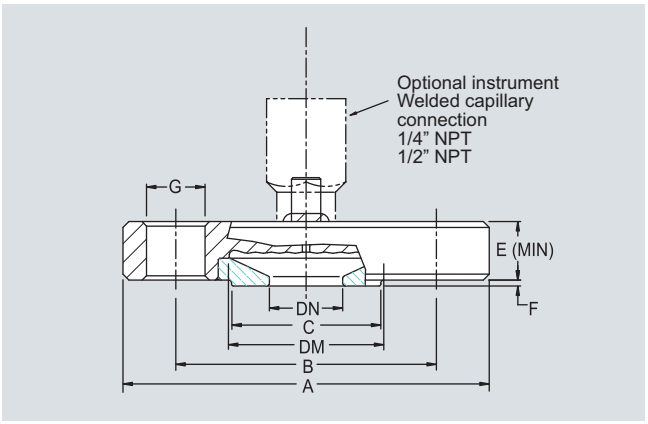
Remote seals for transmitters and pressure gauges

Flange-type diaphragm seal with flexible capillary tube

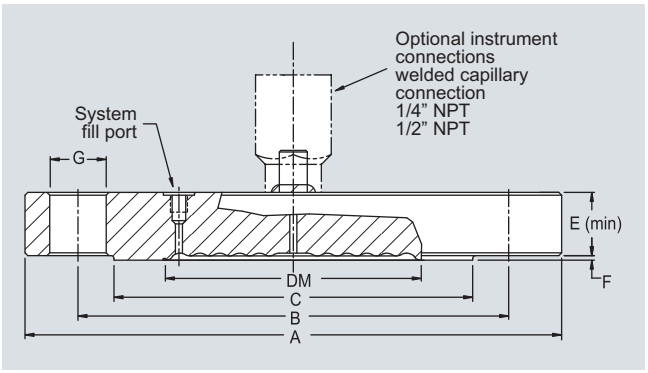
Overview

Flange-type diaphragm seal with flexible capillary extension

Dimensions (Connection to ASME B16.5)



Flange-type diaphragm seal for flanges ≤ 1"



Flange-type diaphragm seal for flanges ≥ 1.5"

Connection to ASME B16.5

Size DN	Class	A	B	C	DM	E	F	G	X	Weight lbs
½"	150	3.50	2.38	1.38	1.3	0.85	0.06	0.62	4	2.2
	300	3.75	2.62	1.38	1.6	0.85	0.06	0.62	4	2.2
¾"	150	3.88	2.75	1.69	1.6	0.85	0.06	0.62	4	2.4
	300	4.62	3.25	1.69	1.6	0.85	0.06	0.75	4	3.5
1"	150	4.25	3.12	2.00	2.1	0.85	0.06	0.62	4	3.1
	300	4.88	3.50	2.00	2.1	0.85	0.06	0.75	4	3.7
1.5"	150	5.00	3.55	2.88	1.9	0.69	0.06	0.62	4	3.5
	300	6.12	4.50	2.88	1.9	0.81	0.06	0.88	4	5.5
	600	6.12	4.50	2.88	1.9	1.13	0.25	0.88	4	7.3
	1500	7.00	4.88	2.88	1.9	1.50	0.25	1.12	4	13.0
	2500	8.00	5.75	2.88	1.9	2.00	0.25	1.25	4	22.9
2"	150	6.00	4.75	3.62	2.4	0.75	0.06	0.75	4	5.9
	300	6.50	5.00	3.62	2.4	0.88	0.06	0.75	8	8.1
	600	6.50	5.00	3.62	2.4	1.25	0.25	0.75	8	12.5
	1500	8.50	6.50	3.62	2.4	1.75	0.25	1.00	8	29.0
	2500	9.25	6.75	3.62	2.4	2.25	0.25	1.12	8	43.6
3"	150	7.50	6.00	5.00	3.5	0.94	0.06	0.75	4	11.7
	300	8.25	6.62	5.00	3.5	1.12	0.06	0.88	8	17.2
	600	8.25	6.62	5.00	3.5	1.50	0.25	0.88	8	24.2
	900	9.50	7.50	5.00	3.5	1.75	0.25	1.00	8	36.7
	1500	10.53	8.00	5.00	3.5	2.13	0.25	1.25	8	53.9
	2500	12.01	9.00	5.00	3.5	2.87	0.25	1.38	8	93.9
4"	150	9.00	7.50	6.19	3.5	0.94	0.06	0.75	8	16.9
	300	10.04	7.88	6.19	3.5	1.25	0.06	0.88	8	27.9
	400	10.4	7.88	6.19	3.5	1.63	0.25	1.00	8	38.3
	600	10.83	8.50	6.19	3.5	1.75	0.25	1.00	8	47.3
	900	11.51	9.25	6.19	3.5	2.00	0.25	1.25	8	60.9
	1500	12.30	9.50	6.19	3.5	2.37	0.25	1.38	8	81.4
	2500	14.00	10.75	6.19	3.5	3.25	0.25	1.62	8	144.5

DN = Nominal pipe size
DM = Effective diaphragm diameter
Class = Flange rating per ASME B16.5
X = Number of bolt holes
All dimensions in inches unless otherwise noted

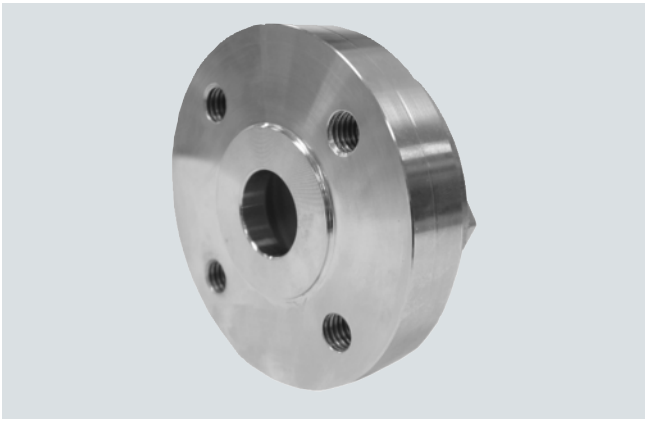
Selection and Ordering data		Order No.	Order code
Flange-type diaphragm seal			
with flexible capillary extension, connected to a SITRANS P transmitter (order separately)			
for pressure 7MF40 ■■ or 7MF42 ■■	C)	7MF4820-	
for absolute pressure 7MF43 ■■	C)	7MF4821-	
for differential pressure 7MF44 ■■	C)	7MF4823-	
• dual seals for DP		1■■■■-■B	■■■
Size and class			
• 2 inch	class 150	L	
• 2 inch	class 300	M	
• 2 inch	class 600	N	
• 2 inch	class 1500	P	
• 3 inch	class 150	Q	
• 3 inch	class 300	R	
• 3 inch	class 600	S	
• 4 inch	class 150	T	
• 4 inch	class 300	U	
• 4 inch	class 400	V	
• 5 inch	class 150	W	
• 5 inch	class 300	X	
• 5 inch	class 400	Y	
Special design, customer information to be supplied		Z	J1Y
Materials and wetted parts			
• SST 316L		A	
• SST 316L with carbon pigmented Teflon lined diaphragm (good upto 500 °F)		E0	
• Monel 400, mat. No. 2.4360		G	
• Hastelloy C276, mat. No. 2.4819		J	
• Tantal		K	
Special design, customer information to be supplied		Z	K1Y
Extension length (316SS standard)			
Without extension (standard version)		0	
Special design, customer information to be supplied for extension		9	L1Y
System fill			
• Medicinal white mineral oil, FDA approved		0	
• Silicone oil DC 200-10		1	
• Silicone oil DC 200-50		2	
• High temperature oil		3	
• Halocarbon (for O_2-application)		4	
• Silicone oil M5		5	
• Syltherm 800		6	
• DC704 silicone oil		7	
• Fluorolube		8	
Special design, customer information to be supplied		9	M1Y
Length of capillary			
• 3 ft		2	
• 5 ft		3	
• 10 ft		4	
• 15 ft		5	
• 20 ft		6	
• 25 ft		7	
• 30 ft		8	
Special design, customer information to be supplied		9	N1Y

Selection and Ordering data	Order code
Further designs Please add **„-Z“** to Order No. and specifiy Order code	
for 7MF4820	
Integrated flame path restriction	A01
Rotatable Flange	B01
DP "H" flange service	B02
Certificate of calibration N.I.S.T. (20 % steps)	C11
Material conformance certificate	C12
Vacuum service (must be specified with HT oil)	V01
Calculation of span of transmitter (completed questionnaire to be attached)	Y05
for 7MF4821	
Integrated flame path restriction	A01
Rotatable Flange	B01
Certificate of calibration N.I.S.T. (20 % steps)	C11
Material conformance certificate	C12
Calculation of span of transmitter (completed questionnaire to be attached)	Y05
for 7MF4823	
Integrated flame path restriction	A02
Rotatable Flange	B01
Certificate of calibration N.I.S.T. (20 % steps)	C11
Material conformance certificate	C12
Vacuum service (must be specified with HT oil)	V03
Calculation of span of transmitter (completed questionnaire to be attached)	Y05

C) Subject to export regulations AL: N, ECCN: EAR99.

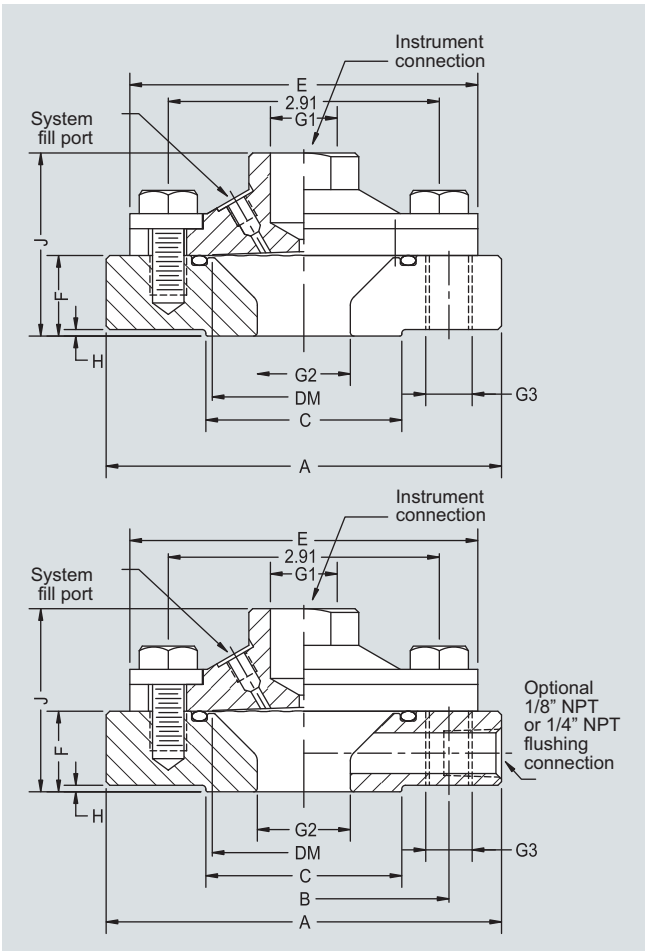
Diaphragm seal "flanged off-line type"

Overview



Diaphragm seal "flanged off-line type"

Dimensions (Connection to ASME B16.5)



G1	G2	G3	A	B	C	DM	E
¼"-NPT or ½"-NPT	½" 150#	4 x ½"-13UNC	3.75	2.38	1.38	2.1	3.74
	½" 300#	4 x ½"-13UNC	3.75	2.62			
	½" 600#	4 x ½"-13UNC	3.75	2.62			
	1" 150#	4 x ½"-13UNC	4.25	3.12	2.00		
	1" 300#	4 x $^5/_8$"-11UNC	4.88	3.50			
	1" 600#	4 x $^5/_8$"-11UNC	4.88	3.50			
	1 ½" 150#	4 x ½"-13UNC	5.00	3.88	2.88		
	1 ½" 300#	4 x ¾"-10UNC	6.12	4.50			
	1 ½" 600#	4 x ¾"-10UNC	6.12	4.50			
	2" 150#	4 x $^5/_8$"-11UNC	6.00	4.75	3.62		
	2" 300#	8 x 0.75	6.50	5.00			
	2" 600#	8 x 0.75	6.50	5.00			

G1	G2	G3	F	H	J	Weight lbs
¼"-NPT or ½"-NPT	½" 150#	4 x ½"-13UNC	1.10	0.06	2.20	4.3
	½" 300#	4 x ½"-13UNC	1.10	0.06	2.20	4.3
	½" 600#	4 x ½"-13UNC	1.26	0.25	2.36	4.4
	1" 150#	4 x ½"-13UNC	0.87	0.06	1.97	4.4
	1" 300#	4 x $^5/_8$"-11UNC	0.87	0.06	1.97	8.5
	1" 600#	4 x $^5/_8$"-11UNC	1.26	0.25	2.36	8.5
	1 ½" 150#	4 x ½"-13UNC	0.87	0.06	1.97	5.0
	1 ½" 300#	4 x ¾"-10UNC	0.87	0.06	1.97	6.6
	1 ½" 600#	4 x ¾"-10UNC	1.26	0.25	2.36	9.1
	2" 150#	4 x $^5/_8$"-11UNC	0.87	0.06	1.97	6.1
	2" 300#	8 x 0.75	0.89	0.06	1.99	8.5
	2" 600#	8 x 0.75	1.28	0.25	2.38	10.0

DM = Effective diaphragm diameter
G1 = Instrument connection
G2 = Process connection
G3 = Threaded bolt hole
All dimensions in inches unless otherwise noted

Diaphragm seal "flanged off-line type", dimensions

Selection and Ordering data		Order No.	Order code
Diaphragm seal "flanged off-line type" MAWP depends on flange			
with flexible armored capillary, 316 stainless steel upper housing SITRANS P for 7MF40 ■■ and 7MF42 ■■ (order separately)	C)	7MF4826 - ■■■■■ - ■B	■■■
Seal design			
Stud mount		1	
All-welded stud mount		2	
Through-hole flange mount		3	
Size and class			
• ½ inch	class 150#RF	A	
• ½ inch	class 300#RF	B	
• ½ inch	class 600#RF	C	
• ¾ inch	class 150#RF	E	
• ¾ inch	class 300#RF	F	
• ¾ inch	class 600#RF	G	
• 1 inch	class 150#RF	J	
• 1 inch	class 300#RF	K	
• 1 inch	class 600#RF	L	
• 1 ½ inch	class 150#RF	N	
• 1 ½ inch	class 300#RF	P	
• 1 ½ inch	class 600#RF	Q	
• 2 inch	class 150#RF	S	
• 2 inch	class 300#RF	T	
• 2 inch	class 600#RF	U	
Special design, customer information to be supplied		Z	J 1 Y
Materials and wetted parts			
• SST 316L		A	
• SST 316L with carbon pigmented Teflon lined diaphragm (good upto 500 °F)		E	
• Monel 400, mat. No. 2.4360		G	
• Hastelloy C276, mat. No. 2.4819		J	
• Tantal		K	
Special design, customer information to be supplied		Z	K 1 Y
Flushing port(s)			
None		0	
1 x ¼"NPT-female (available w/ SS, HC or MO)		2	
2 x ¼"NPT-female (available w/ SS, HC or MO)		4	
Special design, customer information to be supplied		9	L 1 Y
System fill			
• Medicinal white mineral oil, FDA approved		0	
• Silicone oil DC 200-10		1	
• Silicone oil DC 200-50		2	
• High temperature oil (comes with metal gasket and stronger bolts)		3	
• Halocarbon (for O_2-application)		4	
• Silicone oil M5		5	
• Syltherm 800		6	
• DC704 silicone oil		7	
• Fluorolube		8	
Special design, customer information to be supplied		9	M 1 Y
Length of capillary			
• Direct mount		0	
• 3 ft		2	
• 5 ft		3	
• 10 ft		4	
• 15 ft		5	
• 20 ft		6	
• 25 ft		7	
• 30 ft		8	
Special design, customer information to be supplied		9	N 1 Y

Selection and Ordering data	Order No.	Order code
Further designs Please add **„-Z“** to Order No. and specifiy Order code		
Integrated flame path restriction		A 0 1
DP "H" flange service		B 0 2
Certification of calibration N.I.S.T. (20 % steps)		C 1 1
Material conformance certificate		C 1 2
Vacuum service (must be specified with HT oil)		V 0 1
Calculation of span of transmitter (completed questionnaire to be attached)		Y 0 5

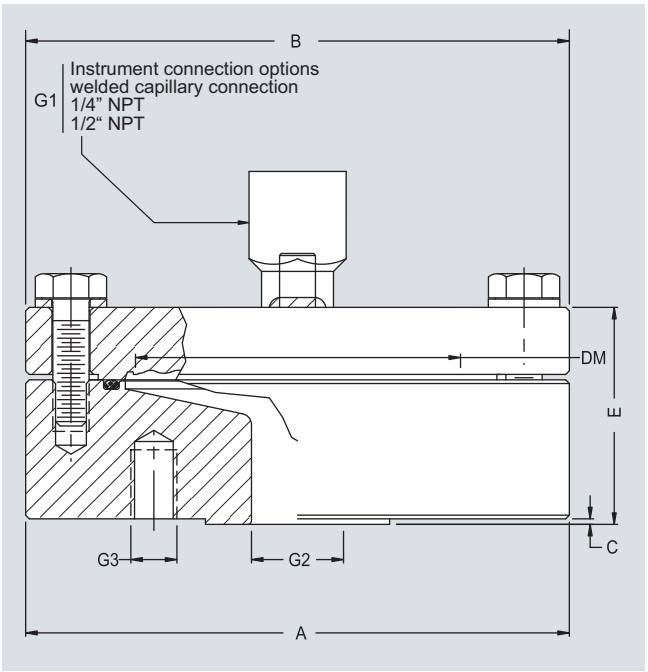
C) Subject to export regulations AL: N, ECCN: EAR99.

Diaphragm seal "flanged off-line low-pressure type"

Overview

Diaphragm seal "flanged off-line low-pressure type"

Dimensions (Connection to ASME B16.5)



G2		G3	X	A	B	C	DM	E
Size	Class							
½"	150#	½"-13UNC	4	5.91		0.06		2.36
½"	300#	½"-13UNC	4	5.91		0.06		2.36
½"	600#	½"-13UNC	4	5.91		0.25		2.55
¾"	150#	½"-13UNC	4	5.91		0.06		2.36
¾"	300#	5/8"-11UNC	4	5.91		0.06		2.36
¾"	600#	5/8"-11UNC	4	5.91		0.25		2.55
1"	150#	½"-13UNC	4	5.91		0.06		2.36
1"	300#	5/8"-11UNC	4	5.91	5.91	0.06	3.5	2.36
1"	600#	5/8"-11UNC	4	5.91		0.25		2.55
1 ½"	150#	½"-13UNC	4	5.91		0.06		2.36
1 ½"	300#	¾"-10UNC	4	6.12		0.06		2.46
1 ½"	600#	¾"-10UNC	4	6.12		0.25		2.65
2"	150#	5/8"-11UNC	4	6.00		0.06		2.36
2"	300#	5/8"-11UNC	8	6.50		0.06		2.36
2"	600#	5/8"-11UNC	8	6.50		0.25		2.55

DM = Effective diaphragm diameter
G2 = Process connection
G3 = Threaded bolt hole
X = Number of bolt holes
Class = Flange rating per ASME B16.5
Size = Nominal pipe size
All dimensions in inches unless otherwise noted

Diaphragm seal "flanged off-line low-pressure type", dimensions

Selection and Ordering data		Order No.	Order code
Diaphragm seal "flanged off-line low-pressure type"			
with flexible armored capillary, 316 stainless steel upper housing SITRANS P for 7MF40 ■■ and 7MF42 ■■ (order separately)	C)	7MF4827- 1■■■■-■B	■■■
Size and class			
• ½ inch	class 150#RF	A	
• ½ inch	class 300#RF	B	
• ½ inch	class 600#RF	C	
• ¾ inch	class 150#RF	E	
• ¾ inch	class 300#RF	F	
• ¾ inch	class 600#RF	G	
• 1 inch	class 150#RF	J	
• 1 inch	class 300#RF	K	
• 1 inch	class 600#RF	L	
• 1 ½ inch	class 150#RF	N	
• 1 ½ inch	class 300#RF	P	
• 1 ½ inch	class 600#RF	Q	
• 2 inch	class 150#RF	S	
• 2 inch	class 300#RF	T	
• 2 inch	class 600#RF	U	
Special design, customer information to be supplied		Z	J 1 Y
Materials and wetted parts			
• SST 316L		A	
• SST 316L with carbon pigmented Teflon lined diaphragm (good upto 500 °F)		E	
• Monel 400, mat. No. 2.4360		G	
• Hastelloy C276, mat. No. 2.4819		J	
• Tantal		K	
Special design, customer information to be supplied		Z	K 1 Y
Flushing port(s)			
None		0	
1 x ¼"NPT-female (available w/ SS, HC or MO)		2	
2 x ¼"NPT-female (available w/ SS, HC or MO)		4	
Special design, customer information to be supplied		9	L 1 Y
System fill			
• Medicinal white mineral oil, FDA approved		0	
• Silicone oil DC 200-10		1	
• Silicone oil DC 200-50		2	
• High temperature oil		3	
• Halocarbon (for O_2-application)		4	
• Silicone oil M5		5	
• Syltherm 800		6	
• DC704 silicone oil		7	
• Fluorolube		8	
Special design, customer information to be supplied		9	M 1 Y
Length of capillary			
• Direct mount		0	
• 3 ft		2	
• 5 ft		3	
• 10 ft		4	
• 15 ft		5	
• 20 ft		6	
• 25 ft		7	
• 30 ft		8	
Special design, customer information to be supplied		9	N 1 Y
Further designs Please add **„-Z“** to Order No. and specifiy Order code			
Integrated flame path restriction			A 0 1
DP "H" flange service			B 0 2
Certification of calibration N.I.S.T. (20 % steps)			C 1 1
Material conformance certificate			C 1 2
Vacuum service (must be specified with HT oil)			V 0 1
Calculation of span of transmitter (completed questionnaire to be attached)			Y 0 5

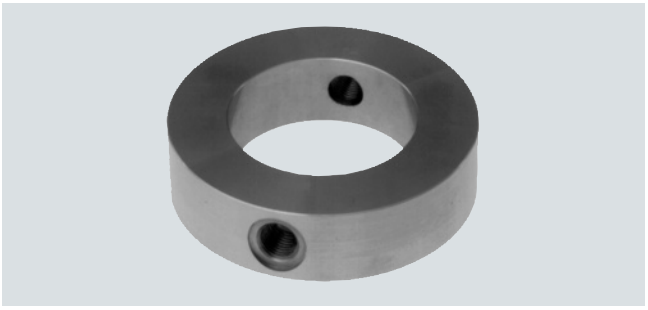
C) Subject to export regulations AL: N, ECCN: EAR99.

Selection and Ordering data		Order No.	Order code
Diaphragm seal "flanged off-line low-pressure type"			
with flexible armored capillary, 316 stainless steel upper housing SITRANS P for 7MF44 ■■ (order separately)	C)	7MF4828- 1■■■■-■B	■■■
Size and class			
• ½ inch	class 150#RF	A	
• ½ inch	class 300#RF	B	
• ½ inch	class 600#RF	C	
• ¾ inch	class 150#RF	E	
• ¾ inch	class 300#RF	F	
• ¾ inch	class 600#RF	G	
• 1 inch	class 150#RF	J	
• 1 inch	class 300#RF	K	
• 1 inch	class 600#RF	L	
• 1 ½ inch	class 150#RF	N	
• 1 ½ inch	class 300#RF	P	
• 1 ½ inch	class 600#RF	Q	
• 2 inch	class 150#RF	S	
• 2 inch	class 300#RF	T	
• 2 inch	class 600#RF	U	
Special design, customer information to be supplied		Z	J 1 Y
Materials and wetted parts			
• SST 316L		A	
• SST 316L with carbon pigmented Teflon lined diaphragm (good upto 500 °F)		E	
• Monel 400, mat. No. 2.4360		G	
• Hastelloy C276, mat. No. 2.4819		J	
• Tantal		K	
Special design, customer information to be supplied		Z	K 1 Y
Flushing port(s)			
None		0	
1 x ¼"NPT-female (available w/ SS, HC or MO)		2	
2 x ¼"NPT-female (available w/ SS, HC or MO)		4	
Special design, customer information to be supplied		9	L 1 Y
System fill			
• Medicinal white mineral oil, FDA approved		0	
• Silicone oil DC 200-10		1	
• Silicone oil DC 200-50		2	
• High temperature oil		3	
• Halocarbon (for O_2-application)		4	
• Silicone oil M5		5	
• Syltherm 800		6	
• DC704 silicone oil		7	
• Fluorolube		8	
Special design, customer information to be supplied		9	M 1 Y
Length of capillary			
• 3 ft		2	
• 5 ft		3	
• 10 ft		4	
• 15 ft		5	
• 20 ft		6	
• 25 ft		7	
• 30 ft		8	
Special design, customer information to be supplied		9	N 1 Y
Further designs Please add **„-Z“** to Order No. and specifiy Order code			
Integrated flame path restriction			A 0 2
Certification of calibration N.I.S.T. (20 % steps)			C 1 1
Material conformance certificate			C 1 2
Vacuum service (must be specified with HT oil)			V 0 1
Calculation of span of transmitter (completed questionnaire to be attached)			Y 0 5

C) Subject to export regulations AL: N, ECCN: EAR99.

Flushing rings

Overview



Flushing ring

Flushing rings are required for flange-mounted and pancake type remote seals (Order No. 7MF4800 ... 7MF4823) if the danger exists that the process conditions and the geometry of the connection could cause the process to form deposits or blockages.

The flushing ring is clamped between the process flange and the remote seal.

Deposits can be flushed away from the diaphragm through the holes in the side, or the pressure volume can be vented. Different nominal diameters and forms permit adaptation to the respective process flange.

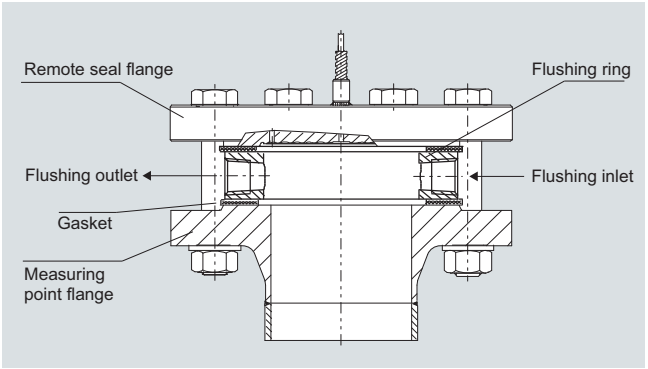
Process connection

For flanges to EN and ASME:
DN 50, 80, 100, 125; PN 16 ... 100 or
DN 2 inch, 3 inch, 4 inch, 5 inch; Class 150 ... 600

Standard design

Material: CrNi-Stahl, mat. No. 1.4404/316L
Sealing faces and flushing holes: See Ordering data

Design

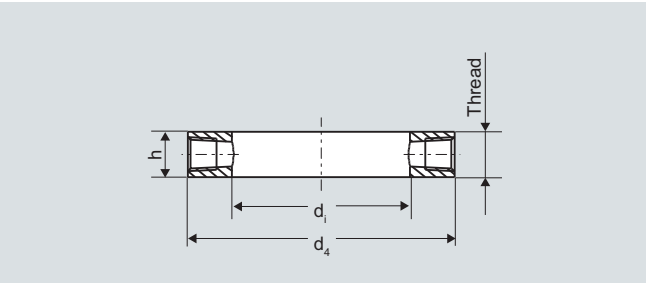


Installation example

Technical specifications

Flushing ring for remote seals of pancake and flange design	
Nom. diam.	Nom. press.
• DN 50	PN 16 ... PN 100
• DN 80	PN 16 ... PN 100
• DN 100	PN 16 ... PN 100
• DN 125	PN 16 ... PN 100
• 2 inch	Class 150 ... class 600
• 3 inch	Class 150 ... class 600
• 4 inch	Class 150 ... class 600
• 5 inch	Class 150 ... class 600
Sealing face	
• To EN 1092-1	Form B1 Form B2 Form D/Form D Form C/Form C Form C/Form C Form E Form F
• To ASME B16.5	RF 125 ... 250 AA RFSF RJT ring groove
Flushing holes (2 off), female thread:	• G¼ • G½ • ¼-18 NPT • ½-14 NPT
Material	Stainless steel 1.4404/316L

Dimensional drawings



Connection to EN 1092-1

DN	PN	d_4	d_i	h	Weight
(mm)	(bar)	(mm)	(mm)	(mm)	(kg)
50	16 ... 100	102	62	30	1.10
80	16 ... 100	138	92	30	1.90
100	16 ... 100	162	92	30	3.15
125	16 ... 100	188	126	30	3.50

Connection to ASME B 16.5

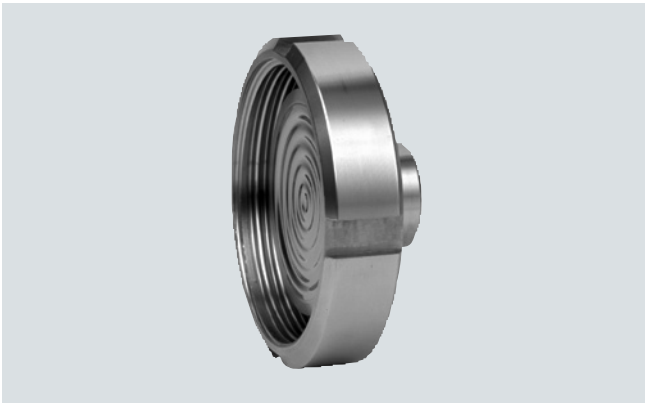
DN	Class	d_4		d_i		h		Weight	
inch		mm	(inch)	mm	(inch)	mm	(inch)	kg	(lb)
2	150 ... 600	92	(3.62)	62	(2.44)	30	(1.18)	0.60	(1.32)
3	150 ... 600	127	(5)	92	(3.62)	30	(1.18)	1.05	(2.31)
4	150 ... 600	157	(6.18)	92	(3.62)	30	(1.18)	2.85	(6.28)
5	150 ... 600	185.5	(7.3)	126	(4.96)	30	(1.18)	3.30	(7.28)

Flushing ring, dimension drawing

Selection and Ordering data		Order No. Ord. code
Flushing ring		**7 M F 4 8 2 5 -**
for remote seals 7MF4900 to 7MF4923		**1** ■ ■ ■ ■ ■ ■ ■
Nom. diam.	**Nom. press.**	
• 2 inch	Class 150 ... 600	**G**
• 3 inch	Class 150 ... 600	**H**
• 4 inch	Class 150 ... 600	**J**
• 5 inch	Class 150 ... 600	**K**
Other version Add Order code and plain text: Nominal diameter: ...; Nominal pressure: ...		**Z** **J 1 Y**
Sealing face		
• ASME B16.5		
- RF 125 ... 250 AA		**M**
- RFSF		**Q**
- RJT ring groove		**R**
Other version Add Order code and plain text: Sealing face: ...		**Z** **K 1 Y**
Flushing holes (2 off)		
• Female thread G¼		**1**
• Female thread G½		**2**
• Female thread ¼-18 NPT		**3**
• Female thread ½-14 NPT		**4**
Material		
• Stainless steel 316L		**0**
Other version Add Order code and plain text: Material: ...		**9** **M 1 Y**
Further designs Please add **„-Z“** to Order No. and specifiy Order code		
Acceptance test certificate B to EN 10204, section 3.1.B		**C 1 2**

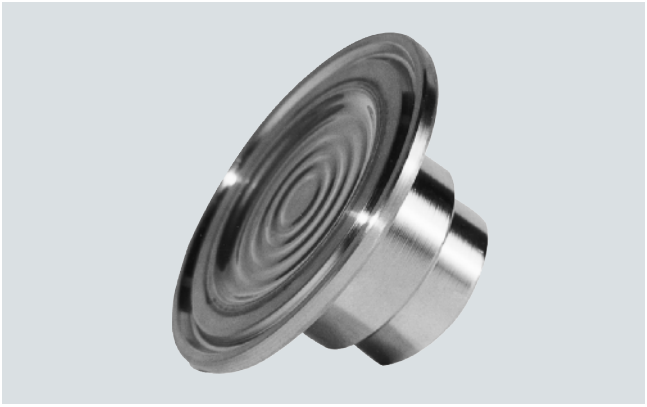
Diaphragm seal with quick connection

Overview



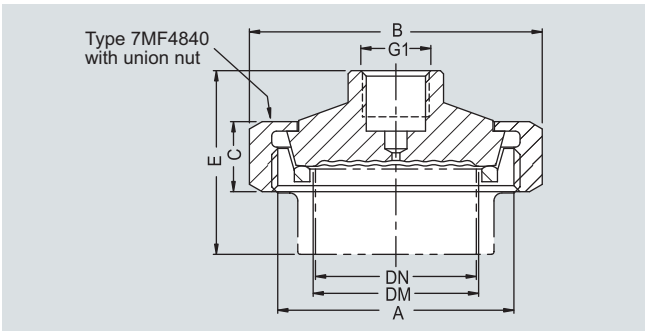
Diaphragm seal with quick connection, with slotted union nut

Overview



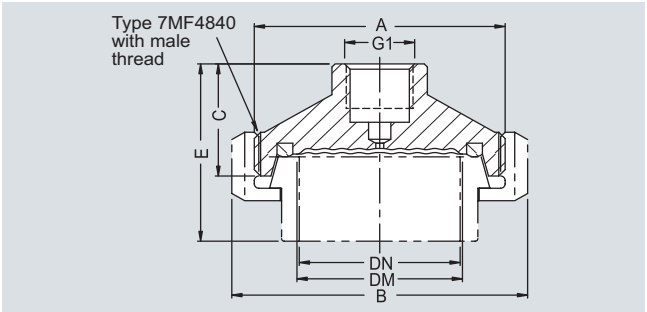
Diaphragm seal with quick connection, Tri-Clamp connection

Dimensions (connection to ASME B16.5)



DN [mm]	MAWP [psi]	A [mm]	B	C	DM	E	G1	Weight [lbs]
25	600	Rd 52 x 1/6	2.48	0.83	1.0	2.36	¼"-NPT or ½"-NPT female	1.3
32	600	Rd 58 x 1/6	2.76	0.83	1.3	2.72		1.6
40	600	Rd 65 x 1/6	3.07	0.83	1.6	2.17		2.5
50	360	Rd 78 x 1/6	3.62	0.87	2.1	2.32		2.8

Diaphragm seal with quick connection, with slotted union nut

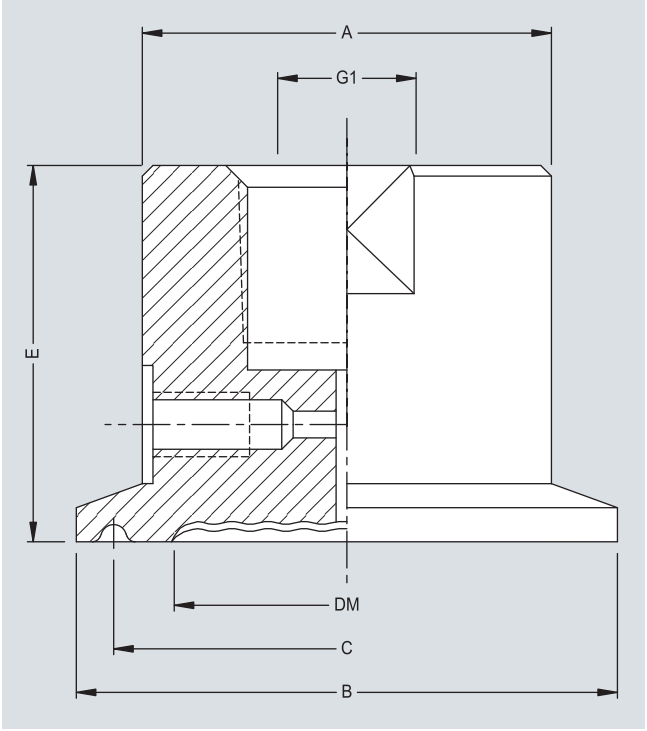


DN [mm]	MAWP [psi]	A [mm]	B	C	DM	E	G1	Weight [lbs]
40	600	Rd 65 x 1/6	3.07	1.12	1.6	2.17	¼"-NPT or ½"-NPT female	2.8
50	360	Rd 78 x 1/6	3.62	1.42	2.1	2.24		3.0

DM = Effective diaphragm diameter
MAWP = Maximum Working Pressure @ 250 °F
G1 = Instrument connection
DN = Nominal pipe size
All dimensions in inches unless otherwise noted

Diaphragm seal with quick connection, with male thread, dimensions

Dimensions (connection to ASME B16.5)

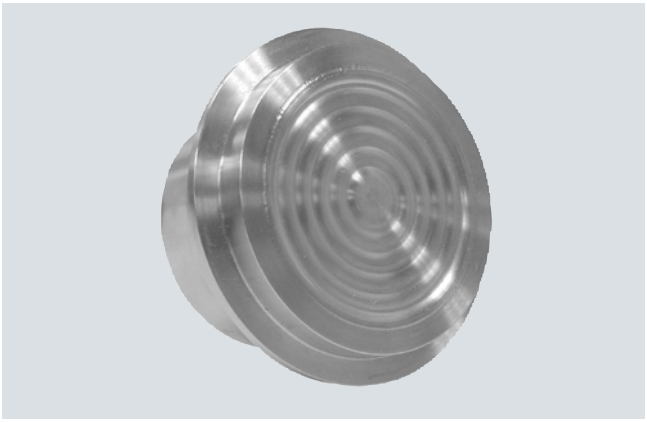


Size [in]	MAWP [psi]	A	B	C	DM	E	G1	Weight [lbs]
1.5	600	1.50	1.97	1.71	1.0	1.38	¼"-NPT or ½"-NPT female	1.3
2	550	1.50	2.52	2.22	1.6			1.7
2.5	450	2.52	3.05	2.78	2.0			2.0
3	350	2.31	3.58	3.28	2.8			2.4
4	250	2.31	4.68	4.34	3.5			2.7

DM = Effective diaphragm diameter
MAWP = Maximum Working Pressure @ 250 °F, higher rating with appropriate clamping device
G1 = Instrument connection
Size = Nominal pipe size
All dimensions in inches unless otherwise noted

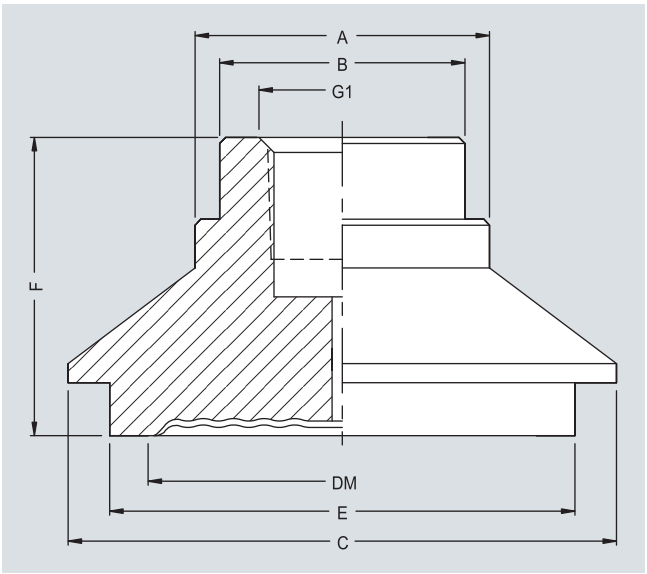
Diaphragm seal with quick connection, Tri-Clamp connection, dimensions

Overview



Diaphragm seal with quick connection, "i"-line (Cherry Burrel - male)

Dimensions (connection to ASME B16.5)



Size [in]	MAWP [psi]	A	B	C	DM	E	F	G1	Weight [lbs]
1.5	500	1.42	1.18	2.00	1.3	1.74	1.38	¼"-NPT or ½"-NPT female	1.3
2	450		1.18	2.64	1.8	2.24	1.44		1.7
3	350		1.30	3.87	2.8	3.30	1.59		2.4

DM = Effective diaphragm diameter
MAWP = Maximum Working Pressure @ 250 °F, higher rating with appropriate clamping device
G1 = Instrument connection
Size = Nominal pipe size
All dimensions in inches unless otherwise noted

Diaphragm seal with quick connection, "i"-line (Cherry Burrel - male), dimensions

Selection and Ordering data	Order No.	Order code
Diaphragm seal		
with quick connection for gage pressure transmitter SITRANS P 7MF40 ■■ and 7MF42 ■■ (order separately) made of 316 SS	C) 7MF4840- ■■A0■-■B	■■■
Process connection		
DIN 11 851 with slotted union nut		
DN 25/PN 40	1B	
DN 32/PN 40	1C	
DN 40/PN 40	1D	
DN 50/PN 25	1E	
DN 65/PN 25	1F	
DN 80/PN 25	1G	
DIN 11 851 with screw necks		
DN 25/PN 40	2B	
DN 32/PN 40	2C	
DN 40/PN 40	2D	
DN 50/PN 25	2E	
DN 65/PN 25	2F	
DN 80/PN 25	2G	
Tri-Clamp Connection		
1 ½" 600 psi	4L	
2" 550 psi	4M	
2 ½" 450 psi	4N	
3" 350 psi	4P	
Varivent (Tuchenhagen)		
Size 25132	5C	
Size 40150	5E	
Sanitary (4" Tank Spud)		
2" extension	6B	
6" extension	6D	
"I"-Line (Cherry Burrell - male)		
1 ½" 500 psi	5U	
2" 450 psi	5V	
3" 350 psi	5W	
Special design, customer information to be supplied	9Z	H1Y +J1Y
System fill		
• Vegetable oil	1	
• Glycerin/Water 86.5/13.5 %	2	
• Neobee M20	3	
• Mineral oil	4	
Special design, customer information to be supplied	9	M1Y
Length of capillary		
• Direct Mount	0	
• 3 ft	2	
• 5 ft	3	
• 10 ft	4	
• 15 ft	5	
• 20 ft	6	
• 25 ft	7	
• 30 ft	8	
Special design, customer information to be supplied	9	N1Y
Further designs		
Please add **„-Z"** to Order No. and specifiy Order code		
Certification of calibration N.I.S.T. (20 % steps)		C11
Material conformance certificate		C12
Vacuum service (must be specified with vegetable oil)		V01
Calculation of span of transmitter (completed questionnaire to be attached)		Y05
Tank Spud accessories		
Sanitary Tank Spud Clamp (1 pc.)		P10
Sanitary Tank Spud O-ring (1 pc.)		P11
Sanitary Tank Spud Weldolet 2" extension (1 pc.)		P12
Sanitary Tank Spud Weldolet 6" extension (1 pc.)		P13

C) Subject to export regulations AL: N, ECCN: EAR99.

Inline diaphragm seal with quick connection

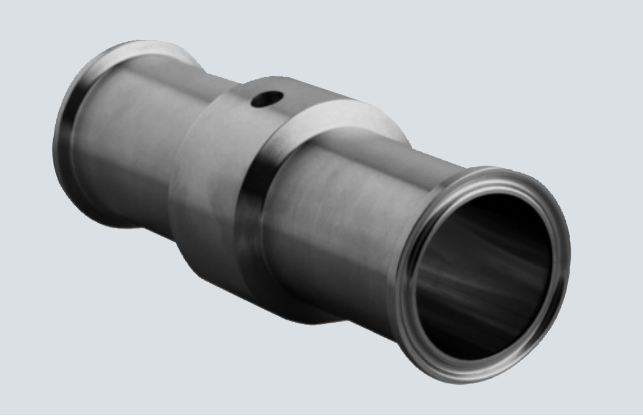
Selection and Ordering data		Order No.	Order code
Diaphragm seal			
with quick connection for differential transmitter SITRANS P 7MF44 ■■ (order separately) made of 316 SS	C)	7MF4843-	
		■■A0■-■B	■■■
Process connection			
DIN 11 851 with slotted union nut			
DN 50/PN 25		1E	
DN 65/PN 25		1F	
DN 80/PN 25		1G	
DIN 11 851 with screw necks			
DN 50/PN 25		2E	
DN 65/PN 25		2F	
DN 80/PN 25		2G	
Tri-Clamp Connection			
2" 550 psi		4M	
2 ½" 450 psi		4N	
3" 350 psi		4P	
4" 250 psi		4Q	
"I"-Line (Cherry Burrell - male)			
3" 350 psi		5W	
4" 200 psi		5X	
Sanitary (4" Tank Spud)			
2" extension		6B	
6" extension		6D	
Special design, customer information to be supplied		9Z	H1Y +J1Y
System fill			
• Vegetable oil		1	
• Glycerin/Water 86.5/13.5 %		2	
• Neobee M20		3	
• Mineral oil		4	
Special design, customer information to be supplied		9	M1Y
Length of capillary			
• 3 ft		2	
• 5 ft		3	
• 10 ft		4	
• 15 ft		5	
• 20 ft		6	
• 25 ft		7	
• 30 ft		8	
Special design, customer information to be supplied		9	N1Y
Further designs			
Please add **„-Z“** to Order No. and specifiy Order code			
Certification of calibration N.I.S.T. (20 % steps)			C11
Material conformance certificate			C12
Vacuum service (must be specified with vegetable oil)			V03
Calculation of span of transmitter (completed questionnaire to be attached)			Y05
Tank Spud accessories			
Sanitary Tank Spud Clamp (1 pc., two required)			P10
Sanitary Tank Spud O-ring (1 pc., two required)			P11
Sanitary Tank Spud Weldolet 2" extension (1 pc., two required)			P12
Sanitary Tank Spud Weldolet 6" extension (1 pc., two required)			P13

C) Subject to export regulations AL: N, ECCN: EAR99.

Overview

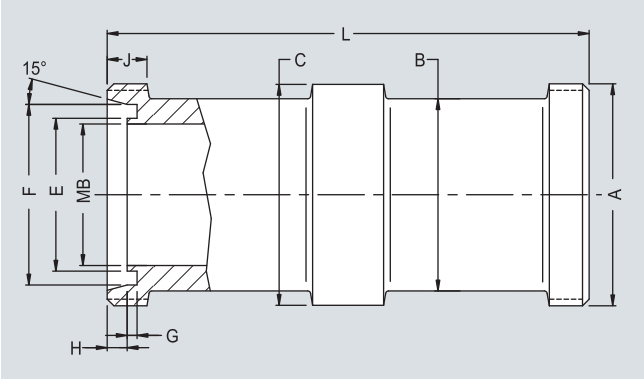
Inline diaphragm seal with quick connector, DIN 11851 with thread

Overview



Inline diaphragm seal with quick connection, Tri-clamp

Dimensions (connection to ASME B16.5)

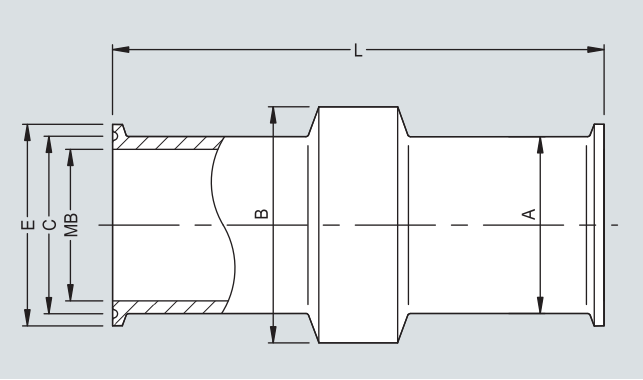


DN [mm]	MAWP [psi]	A	B	C	E	G	H	J	L	MB
15	600	Rd34x1/8	1.10	1.57	0.71	0.12	0.16	0.47	4.1	0.63
25	600	Rd52x1/6	1.50	2.05	1.18	0.14	0.28	0.55	5.0	1.02
40	600	Rd65x1/6	2.17	2.56	1.65	0.14	0.28	0.55	6.3	1.50
50	360	Rd78x1/6	2.68	3.07	2.13	0.14	0.28	0.55	6.7	1.97
65	360	Rd95x1/6	3.35	3.74	2.80	0.14	0.31	0.63	7.2	2.60
80	360	Rd110x1/4	4.33	4.33	3.35	0.14	0.31	0.79	7.2	3.19
100	360	Rd130x1/4	5.12	5.12	4.09	0.16	0.39	0.79	7.2	3.94

MB = Internal diameter
MAWP = Maximum Working Pressure @ 250 °F, higher rating with appropriate clamping device
DN = Nominal pipe size
All dimensions in inches unless otherwise noted

Inline diaphragm seal with quick connector, DIN 11851 with thread, dimensions

Dimensions (connection to ASME B16.5)



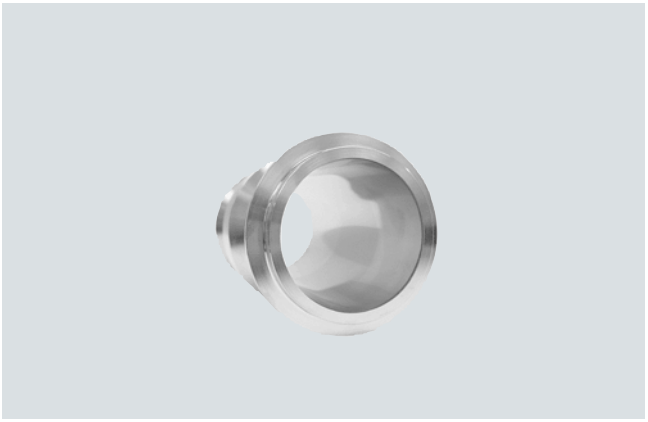
Size	MAWP [psi]	A	B	C	E	L	MB
¾"	600	0.7	1.34	0.8	0.98	3.8	0.6
1"	600	1.4	1.97	1.7	1.97	4.5	1.0
1.5"	600	1.7	1.97	1.7	1.97	5.7	1.5
2"	550	2.2	2.50	2.2	2.50	6.1	1.9
2.5"	450	2.7	3.10	2.8	3.10	6.1	2.4
3"	350	3.2	3.60	3.3	3.60	6.1	2.9
3.5"	350	3.7	4.20	3.8	4.20	6.1	3.3
4"	250	4.3	4.70	4.3	4.70	6.1	3.8

MB = Internal diameter
MAWP = Maximum Working Pressure @ 250 °F, higher rating with appropriate clamping device
Size = Nominal pipe size
All dimensions in inches unless otherwise noted

Inline diaphragm seal with quick connection, Tri-clamp, dimensions

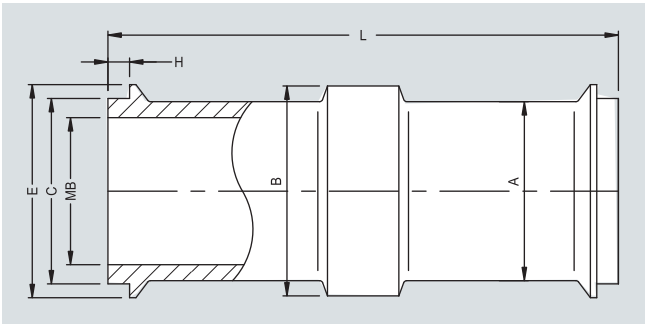
Inline diaphragm seal with quick connection

Overview



Inline diaphragm seal with quick connection, "i"-Line (Cherry Burrell - male/male)

Dimensions (connection to ASME B16.5)



Size	MAWP [psi]	A	B	C	E	H	L	MB
1.5"	500	1.68	1.97	1.74	2.00	0.203	4.79	1.38
2"	450	2.25	2.50	2.24	2.64	0.258	5.54	1.88
2.5"	350	2.75	3.10	2.74	3.31	0.312	6.38	2.37

MB = Internal diameter
MAWP = Maximum Working Pressure @ 250 °F, higher rating with appropriate clamping device
Size = Nominal pipe size

All dimensions in inches unless otherwise noted

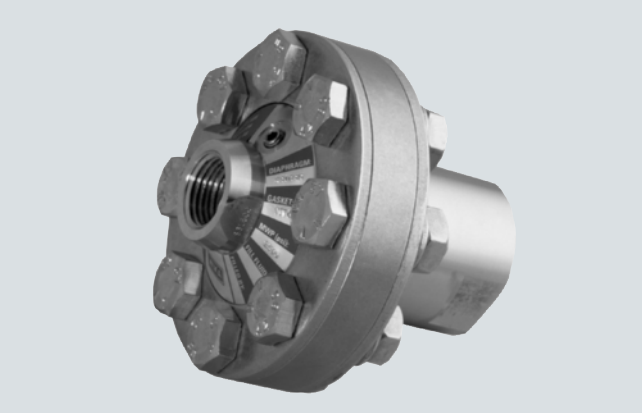
Inline diaphragm seal with quick connection, "i"-Line (Cherry Burrell - male/male), dimensions

Selection and Ordering data

		Order No.	Order code
Inline diaphragm seal			
with quick connection for transmitter SITRANS P for 7MF40 ■■ and 7MF42 ■■ (order separately) made of 316 SS	C)	7MF4850- ■■A0■-■B	■■■
Process connection			
DIN 11 851 with thread [C]			
DN 25/PN 40		2B	
DN 40/PN 40		2D	
DN 50/PN 25		2E	
DN 65/PN 25		2F	
DN 80/PN 25		2G	
DN100/PN 25		2H	
Tri-Clamp Connection			
1" 600 psi		4K	
1 ½" 600 psi		4L	
2" 550 psi		4M	
2 ½" 450 psi		4N	
3" 350 psi		4P	
"I"-Line (Cherry Burrell - male/male)			
1" 500 psi		5R	
1 ½" 500 psi		5U	
2" 450 psi		5V	
3" 350 psi		5W	
Special design, customer information to be supplied		9Z	H1Y +J1Y
System fill			
• Vegetable oil		1	
• Glycerin/Water 86.5/13.5 %		2	
• Neobee M20		3	
• Mineral oil		4	
Special design, customer information to be supplied		9	M1Y
Length of capillary			
• Direct mount		0	
• 3 ft		2	
• 5 ft		3	
• 10 ft		4	
• 15 ft		5	
• 20 ft		6	
• 25 ft		7	
• 30 ft		8	
Special design, customer information to be supplied		9	N1Y
Further designs			
Please add **„-Z“** to Order No. and specifiy Order code			
Certification of calibration N.I.S.T. (20 % steps)			C11
Material conformance certificate			C12
Vacuum service (must be specified with vegetable oil)			V03
Calculation of span of transmitter (completed questionnaire to be attached)			Y05

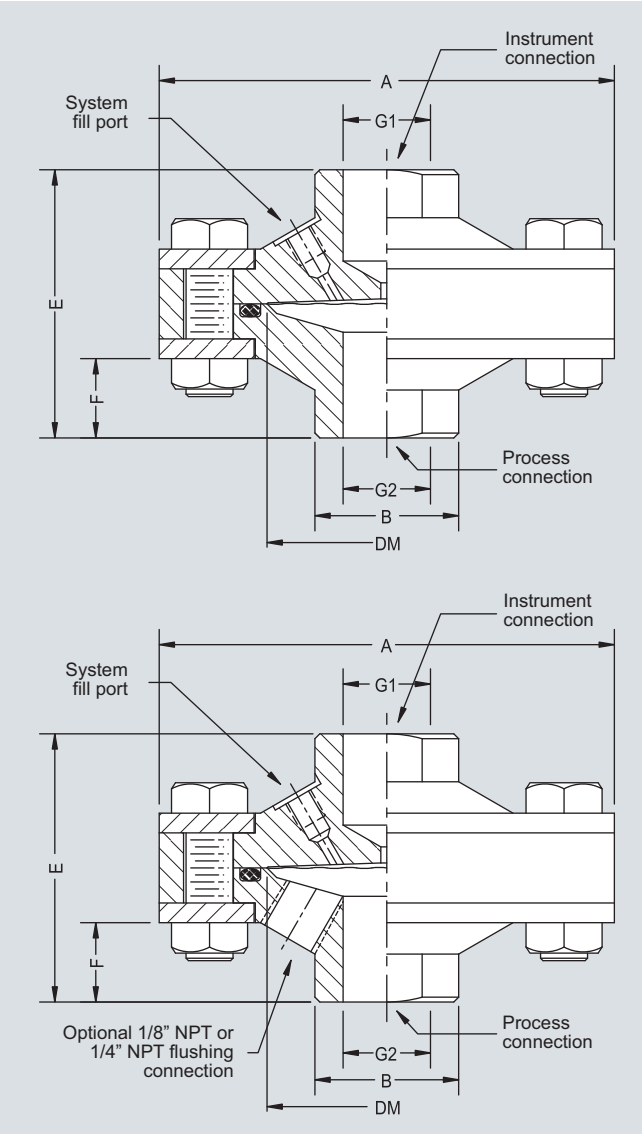
C) Subject to export regulations AL: N, ECCN: EAR99.

Overview



Diaphragm seal "threaded design"

Dimensions (Connection to ASME B16.5)



G1	G2	A	B	DM	E	F	Weight [lbs]
¼"-NPT or ½"-NPT	¼"-NPT or ½"-NPT	3.74	1.18	2.1	2.20	0.63	3.0
	¾"-NPT		1.41	2.1	2.36	0.79	3.4
	1"-NPT		1.77	2.1	3.46	1.89	3.6

G1 = Instrument connection, G2 = Process connection
DM = Effective diaphragm diameter
All dimensions in inches unless otherwise noted

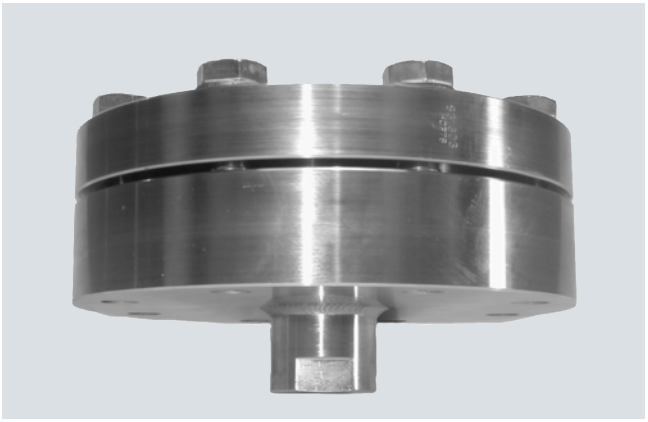
Diaphragm seal "threaded design"

Selection and Ordering data	Order No.	Order code
Diaphragm seal "threaded design" MAWP 3675 psi		
with flexible armored capillary, 316 stainless steel upper housing SITRANS P for 7MF40■■ and 7MF42■■ pressure (order separately) C)	7MF4861- 1■■■■-■B	■■■
Size and class		
• ¼"NPT-female	A	
• ½"NPT-female	B	
• ¾"NPT-female	C	
• 1"NPT-female	D	
Special design, customer inform. to be supplied	Z	J 1 Y
Materials and wetted parts		
• SST 316L	A	
• SST 316L with carbon pigmented Teflon lined diaphragm (good upto 500 °F)	E	
• SST 316L with Hastelloy C276 diaphragm	F	
• SST 316L with PFA coated diaphragm (good upto 500 °F)	D	
• Monel 400, mat. No. 2.4360	G	
• Hastelloy C276, mat. No. 2.4819	J	
• Hastelloy C276 lower housing with Tantalum diaphragm	K	
Special design, customer inform. to be supplied	Z	K 1 Y
Flushing port(s)		
None	0	
1 x ¼"NPT-female	2	
2 x ¼"NPT-female	4	
Special design, customer inform. to be supplied	9	L 1 Y
System fill		
• Medicinal white mineral oil, FDA approved	0	
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• High temperature oil (comes with metal gasket and stronger bolts)	3	
• Halocarbon (for O_2-application)	4	
• Silicone oil M5	5	
• Syltherm 800	6	
• DC704 silicone oil	7	
• Fluorolube	8	
Special design, customer inform. to be supplied	9	M 1 Y
Length of capillary		
• Direct mount	0	
• 3 ft	2	
• 5 ft	3	
• 10 ft	4	
• 15 ft	5	
• 20 ft	6	
• 25 ft	7	
• 30 ft	8	
Special design, customer information to be supplied	9	N 1 Y
Further designs Please add **„-Z"** to Order No. and specify Order code		
Integrated flame path restriction		A 0 1
DP "H" flange service		B 0 2
Certification of calibration N.I.S.T. (20 % steps)		C 1 1
Material conformance certificate		C 1 2
Vacuum service (must be specified with HT oil)		V 0 1
Calculation of span of transmitter (completed questionnaire to be attached)		Y 0 5

C) Subject to export regulations AL: N, ECCN: EAR99.

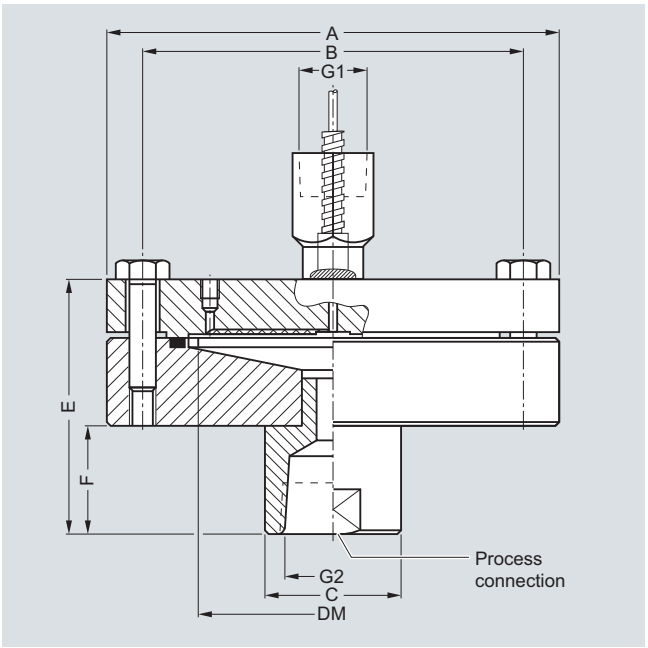
Diaphragm seal "threaded, low-pressure design"

Overview



Diaphragm seal "threaded, low-pressure design"

Dimensions (Connection to ASME B16.5)



Diaphragm seal "threaded, low-pressure design, dimensions

G1	G2	A	B	C	DM	E	F	Weight [lbs]
¼"-NPT or ½"-NPT	¼"-NPT	5.91	4.92	1.25	3.5	3.00	0.90	14.0
	½"-NPT			1.25		3.00	0.90	14.0
	¾"-NPT			1.38		3.20	1.10	14.2
	1"-NPT			1.75		3.50	1.40	14.5

G1 = Instrument connection
G2 = Process connection
DM = Effective diaphragm diameter
All dimensions in inches unless otherwise noted

Selection and Ordering data

	Order No.	Order code
Diaphragm seal "threaded, low-pressure design" MAWP 1,500 psi		
with flexible armored capillary, 316 stainless steel upper housing SITRANS P for 7MF40■■ and 7MF42 ■■ pressure (order separately) C)	7MF4862- 1■■■■-■B	■■■
Size and class		
• ¼"NPT-female	A	
• ½"NPT-female	B	
• ¾"NPT-female	C	
• 1"NPT-female	D	
Special design, customer information to be supplied	Z	J 1 Y
Materials and wetted parts		
• SST 316L	A	
• SST 316L with carbon pigmented Teflon lined diaphragm[1)]	E	
• SST 316L with Hastelloy C276 diaphragm	F	
• SST 316L with PFA coated diaphragm	D	
• Monel 400, mat. No. 2.4360	G	
• Hastelloy C276, mat. No. 2.4819	J	
• Hastelloy C276 lower housing with Tantalum diaphragm	K	
Special design, customer information to be supplied	Z	K 1 Y
Flushing port(s)		
None	0	
1 x ¼"NPT-female	2	
2 x ¼"NPT-female	4	
Special design, customer information to be supplied	9	L 1 Y
System fill		
• Medicinal white mineral oil, FDA approved	0	
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• High temperature oil (comes with metal gasket and stronger bolts)	3	
• Halocarbon (for O_2-application)	4	
• Silicone oil M5	5	
• Sylltherm 800	6	
• DC704 silicone oil	7	
• Fluorolube	8	
Special design, customer information to be supplied	9	M 1 Y
Length of capillary		
• Direct mount	0	
• 3 ft	2	
• 5 ft	3	
• 10 ft	4	
• 15 ft	5	
• 20 ft	6	
• 25 ft	7	
• 30 ft	8	
Special design, customer information to be supplied	9	N 1 Y
Further designs Please add **„-Z“** to Order No. and specifiy Order code		
Integrated flame path restriction		A 0 1
Certification of calibration N.I.S.T. (20 % steps)		C 1 1
Material conformance certificate		C 1 2
Vacuum service (must be specified with HT oil)		V 0 1
Calculation of span of transmitter (completed questionnaire to be attached)		Y 0 5

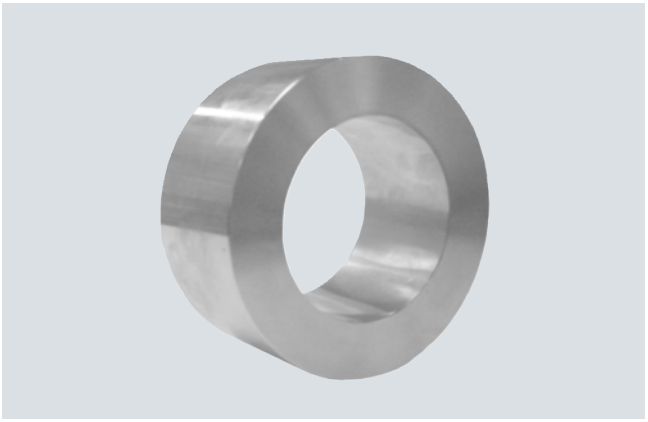
C) Subject to export regulations AL: N, ECCN: EAR99.

Selection and Ordering data	Order No.	Order code
Diaphragm seal "threaded, low-pressure design" MAWP 1,500 psi		
with flexible armored capillary, 316 stainless steel upper housing SITRANS P for 7MF44 ■■ (order separately) C)	7MF4863- 1■■■■-■B	■■■
Size and class		
• ¼"NPT-female	A	
• ½"NPT-female	B	
• ¾"NPT-female	C	
• 1"NPT-female	D	
Special design, customer information to be supplied	Z	J1Y
Materials and wetted parts		
• SST 316L	A	
• SST 316L with carbon pigmented Teflon lined diaphragm (good upto 500 °F)	E	
• SST 316L with Hastelloy C276 diaphragm	F	
• SST 316L with PFA coated diaphragm (good upto 500 °F)	D	
• Monel 400, mat. No. 2.4360	G	
• Hastelloy C276, mat. No. 2.4819	J	
• Hastelloy C276 lower housing with Tantalum diaphragm	K	
Special design, customer information to be supplied	Z	K1Y
Flushing port(s)		
None	0	
1 x ¼"NPT-female	2	
2 x ¼"NPT-female	4	
Special design, customer information to be supplied	9	L1Y
System fill		
• Medicinal white mineral oil, FDA approved	0	
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• High temperature oil (comes with metal gasket and stronger bolts)	3	
• Halocarbon (for O_2-application)	4	
• Silicone oil M5	5	
• Sylthern 800	6	
• DC704 silicone oil	7	
• Fluorolube	8	
Special design, customer information to be supplied	9	M1Y
Length of capillary		
• 3 ft	2	
• 5 ft	3	
• 10 ft	4	
• 15 ft	5	
• 20 ft	6	
• 25 ft	7	
• 30 ft	8	
Special design, customer information to be supplied	9	N1Y
Further designs Please add **„-Z“** to Order No. and specifiy Order code		
Integrated flame path restriction		A02
Certification of calibration N.I.S.T. (20 % steps)		C11
Material conformance certificate		C12
Vacuum service (must be specified with HT oil)		V03
Calculation of span of transmitter (completed questionnaire to be attached)		Y05

C) Subject to export regulations AL: N, ECCN: EAR99.

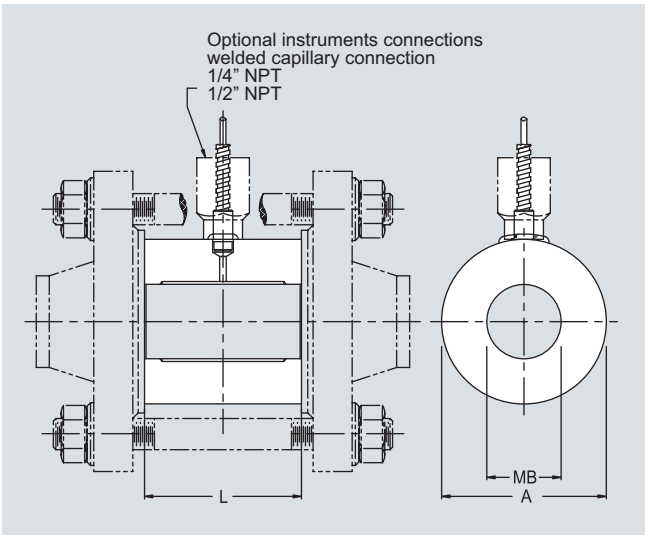
Inline diaphragm seal, wafer for pressure

Overview



Inline diaphragm seal, wafer for pressure

Dimensions (Connection to ASME B16.5)



Size	Class	A	MB	L	Weight [lbs]
1"	150# - 2500#	2.4	1.12	2.36	3.1
1.5"		3.3	1.69		4.8
2"		3.7	2.15		5.5
3"		5.1	3.25		8.8
4"		5.9	4.21		10.3
5"		7.3	5.20		15.0
6"		8.5	6.26		20.9

MB = Effective internal diameter
Class = Flange rating per ASME B16.5
Size = Nominal pipe size
All dimensions in inches unless otherwise noted

Inline diaphragm seal, wafer for pressure, dimensions

Selection and Ordering data

Order No. Order code

Inline diaphragm seals wafer assembled to

SITRANS P for 7MF40 ■■ and 7MF42 ■■ C) **7MF4880-1■■0■-■B■■■**
(order separately)

Size and class		
• 1 inch	class 150 to 2500	**L**
• 1 ½ inch	class 150 to 2500	**M**
• 2 inch	class 150 to 2500	**N**
• 3 inch	class 150 to 2500	**P**
• 4 inch	class 150 to 2500	**Q**
Special design, customer information to be supplied		**Z** **J 1 Y**
Materials and wetted parts		
• SST 316L		**A**
• SST 316L with PFA-Coating (good up to 500 °F)		**D**
• Monel 400, mat. No. 2.4360		**G**
• Hastelloy C276, mat. No. 2.4819		**J**
• Tantal		**K**
Special design, customer information to be supplied		**Z** **K 1 Y**
System fill		
• Medicinal white mineral oil, FDA approved		**0**
• Silicone oil DC 200-10		**1**
• Silicone oil DC 200-50		**2**
• High temperature oil		**3**
• Halocarbon (for O_2-application)		**4**
• Silicone oil M5		**5**
• DC704 silicone oil		**7**
• Fluorolube		**8**
Special design, customer information to be supplied		**9** **M 1 Y**
Length of capillary		
• Direct mount		**0**
• 3 ft		**2**
• 5 ft		**3**
• 10 ft		**4**
• 15 ft		**5**
• 20 ft		**6**
• 25 ft		**7**
• 30 ft		**8**
Special design, customer information to be supplied		**9** **N 1 Y**
Further designs Please add **„-Z"** to Order No. and specifiy Order code		
Integrated flame path restriction		**A 0 1**
Certification of calibration N.I.S.T. (20 % steps)		**C 1 1**
Material conformance certificate		**C 1 2**
Vacuum service (must be specified with HT oil)		**V 0 1**
Calculation of span of transmitter (completed questionnaire to be attached)		**Y 0 5**

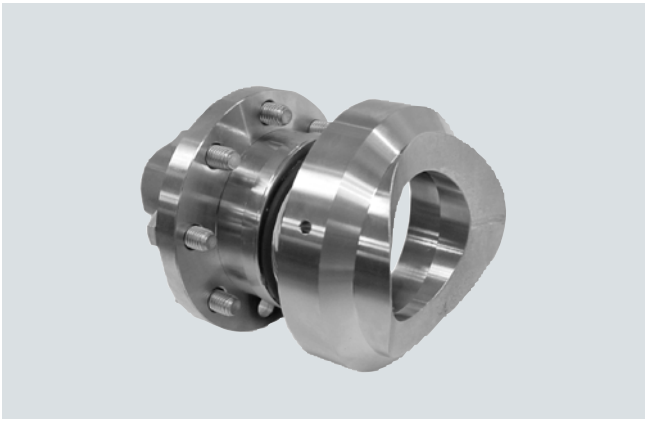
C) Subject to export regulations AL: N, ECCN: EAR99.

Selection and Ordering data	Order No.	Order code
Inline diaphragm seals wafer assembled to		
SITRANS P for 7MF44 ■■ (order separately) C)	**7MF4883-**	
	1■■0■-■B	**■■■**
Size and class		
• 1 inch class 150 to 2500	**L**	
• 1 ½ inch class 150 to 2500	**M**	
• 2 inch class 150 to 2500	**N**	
• 3 inch class 150 to 2500	**P**	
• 4 inch class 150 to 2500	**Q**	
Special design, customer information to be supplied	**Z**	**J 1 Y**
Materials and wetted parts		
• SST 316L	**A**	
• SST 316L with PFA-Coating (good up to 500 °F)	**D**	
	G	
• Monel 400, mat. No. 2.4360	**J**	
• Hastelloy C276, mat. No. 2.4819	**K**	
• Tantal		
Special design, customer information to be supplied	**Z**	**K 1 Y**
System fill		
• Medicinal white mineral oil, FDA approved	**0**	
• Silicone oil DC 200-10	**1**	
• Silicone oil DC 200-50	**2**	
• High temperature oil	**3**	
• Halocarbon (for O_2-application)	**4**	
• Silicone oil M5	**5**	
• DC704 silicone oil	**7**	
• Fluorolube	**8**	
Special design, customer information to be supplied	**9**	**M 1 Y**
Length of capillary		
• 3 ft	**2**	
• 5 ft	**3**	
• 10 ft	**4**	
• 15 ft	**5**	
• 20 ft	**6**	
• 25 ft	**7**	
• 30 ft	**8**	
Special design, customer information to be supplied	**9**	**N 1 Y**
Further designs Please add **„-Z“** to Order No. and specifiy Order code		
Integrated flame path restriction		**A 0 2**
Certification of calibration N.I.S.T. (20 % steps)		**C 1 1**
Material conformance certificate		**C 1 2**
Vacuum service (must be specified with HT oil)		**V 0 3**
Calculation of span of transmitter (completed questionnaire to be attached)		**Y 0 5**

C) Subject to export regulations AL: N, ECCN: EAR99.

Diaphragm seal, saddle

Overview



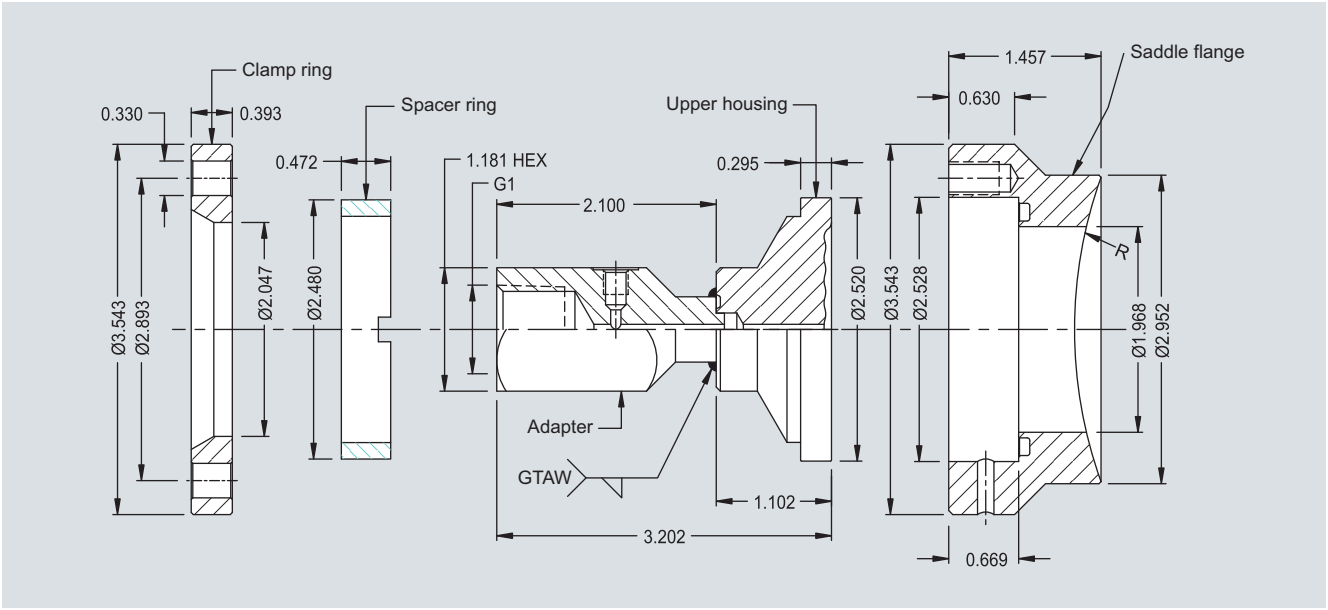
Diaphragm seal, saddle

Dimensions (Connection to ASME B16.5)

Radius R	To fit Pipe size	Pipe O.D.	G1
1.49	2.5	3.00	¼"-NPT or ½"-NPT female
1.77	3.0	3.50	
2.24	4.0	4.50	
2.76	5.0	5.50	
3.35	6.0	6.63	
4.311	8.0	8.625	
5.374	10.0	10.75	
6.378	12.0	12.75	
7.0	14.0	14.75	

G1 = Instrument connection
All dimensions in inches unless otherwise noted

Diaphragm seal, saddle, dimensions



Selection and Ordering data	Order No.	Order code
Diaphragm seal, saddle, MAWP 1,500 psi		
with flexible armored capillary or direct mount, C)	7MF4890-	
316 stainless steel upper housing and assemply hardware SITRANS P for 7MF40 ■■ or 7MF42 ■■ (order separately)	1■■■■-■B	■■■
Nominal pipe size		
• Not applicable (Retrofit for existing 7MF48 ■■)	N	
• 2.5"	A	
• 3"	B	
• 4"	C	
• 5"	D	
• 6"	E	
• 8"	G	
• Retrofit 3" Conoflow (6 bolt pattern)	P	
• Retrofit 3" M&G style (8 bolt pattern)	Q	
• Retrofit 4" Conoflow (6 bolt pattern)	R	
• Retrofit 4" M&G style (8 bolt pattern)	S	
Special design, customer information to be supplied	Z	J 1 Y
Diaphragm material		
• SST 316L	A	
• SST 316L with carbon pigmented Teflon lined diaphragm (good upto 500 °F)	E	
• SST 316L with PFA coated diaphragm (good upto 500 °F)	D	
• Monel 400, mat. No. 2.4360	G	
• Hastelloy C276, mat. No. 2.4819	J	
• Tantal	K	
Special design, customer information to be supplied	Z	K 1 Y
Saddle Material		
None (Retrofit order)	0	
Carbon steel, Ni plated	1	
SST 316L	2	
Hastelloy C276, mat. No. 2.4819	4	
Special design, customer information to be supplied	9	L 1 Y
System fill		
• Medicinal white mineral oil, FDA approved	0	
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• High temperature oil (comes with metal gasket and stronger bolts)	3	
• Halocarbon (for O_2-application)	4	
• Silicone oil M5	5	
• DC704 silicone oil	7	
• Fluorolube	8	
Special design, customer information to be supplied	9	M 1 Y
Length of capillary		
• Direct mount	0	
• 3 ft	2	
• 5 ft	3	
• 10 ft	4	
• 15 ft	5	
• 20 ft	6	
• 25 ft	7	
• 30 ft	8	
Special design, customer information to be supplied	9	N 1 Y
Further designs Please add **„-Z“** to Order No. and specifiy Order code		
Integrated flame path restriction		A 0 1
Certification of calibration N.I.S.T. (20 % steps)		C 1 1
Material conformance certificate		C 1 2
Vacuum service (must be specified with HT oil)		V 0 1
Calculation of span of transmitter (completed questionnaire to be attached)		Y 0 5

C) Subject to export regulations AL: N, ECCN: EAR99.

Measuring setups

Measuring setups

The following pages show examples of typical measuring setups for use of SITRANS P transmitters with and without remote seals, such as:

- Setups for transmitters with connection of remote seals, with associated equations for calculation.
- Questionnaires
  Checking of combination between transmitter and remote seal
- Setups for transmitters without remote seals, with associated equations for calculation
- Questionnaires
  For hydrostatic level measurements

Installation

Remote seals of pancake design are fitted between the connection flange of the measuring point and a blind flange. Remote seals of flanged design are fitted directly on the connection flange of the measuring point. The respective pressure rating of the blind flange or the flanged remote seal must be observed. The transmitter should always be installed below the connection flange, and below the lower connection flange in the case of differential pressure transmitters. When measuring at pressures above atmospheric, the transmitter can also be installed above the connection flange. When measuring at pressures below atmospheric, the transmitter must always be installed below the connection flange, and below the lower connection flange in the case of differential pressure transmitters.

Offset of measuring range

If there is a difference in height between the two connection flanges when measuring with two remote seals, an additional differential pressure results from the oil filling of the remote seal capillaries. This results in an offset of the actual measuring range and must be taken into account when adjusting the transmitter. An offset in the measuring range also occurs when combining a remote seal with a transmitter if the latter is not installed at the same height as the former.

Transmitter output

If the level, separation layer or density increase in closed vessels, the differential pressure and the output signal of the transmitter also increase. If an inverted relationship is desired between the differential pressure and the output signal, the start-of-scale and full-scale values of the SITRANS P must be interchanged.

With open vessels, an increasing pressure is usually assigned to an increasing level, separation layer or density.

Influence of ambient temperature

The capillaries between the remote seal and the transmitter should be kept as short as possible to obtain the good transmission response. Temperature differences between the individual capillaries or between the individual remote seals should be avoided.

If the complete setup is exposed to temperature variations, errors result from the thermal expansion of the filling liquid in the capillaries, in the remote seals and in the connection units of the transmitters.

Notes

- When measuring separation layers, ensure that the layer is positioned between the two spigots. Also ensure that the level in the vessel is always above the top spigot.
- When measuring density, make sure that the level of the medium remains constant. The level is usually above the top spigot.

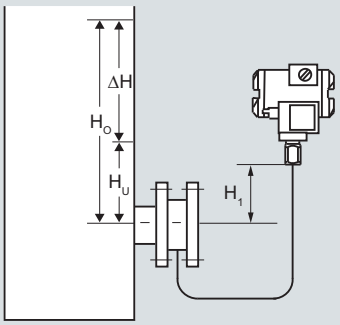
Possible combinations of transmitter and remote seal

Installation type	Transmitter	Remote seal	
A/B	**7MF4033** and **7MF4034**	**7MF4800**, **7MF4810**, **7MF4820**, **7MF4826**, **7MF4827**, **7MF4840**, **7MF4850**, **7MF4861**, **7MF4862**, **7MF4880** and **7MF4890**	
C1/C2	**7MF4233** and **7MF4234**	**7MF4800**, **7MF4810**, **7MF4820**, **7MF4826**, **7MF4827**, **7MF4840**, **7MF4850**, **7MF4861**, **7MF4862**, **7MF4880** and **7MF4890**	(vacuum-proof design required)
	7MF4333 and **7MF4334**	**7MF4801** and **7MF4821**	
D	**7MF4433**, **7MF4434**, **7MF5403** and **7MF5413**	**7MF4803**, **7MF4823**, **7MF4828**, **7MF4843**, **7MF4863** and **7MF4883**	
E	**7MF4433**, **7MF4434**, **7MF5403** and **7MF5413**	**7MF4813**	
G/H/J	**7MF4433**, **7MF4434**, **7MF5403** and **7MF5413**	**7MF4803**, **7MF4823**, **7MF4828**, **7MF4843**, **7MF4863** and **7MF4883**	

Schematics

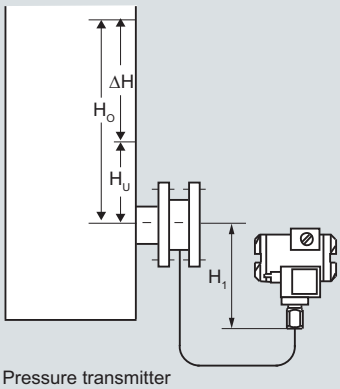
Types of installation for pressure and level measurements (open vessels)

Installation type A



Pressure transmitter
above the measuring point

Installation type B



Pressure transmitter
below the measuring point

$H_1 \leq 7$ m (23 ft), with halocarbon oil as filling liquid only $H_1 \leq 4$ m (13.1 ft)

Installation type A

Start-of-scale: $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_1$

Full-scale: $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_1$

Installation type B

Start-of-scale: $p_{MA} = \rho_{FL} \cdot g \cdot H_U + \rho_{Oil} \cdot g \cdot H_1$

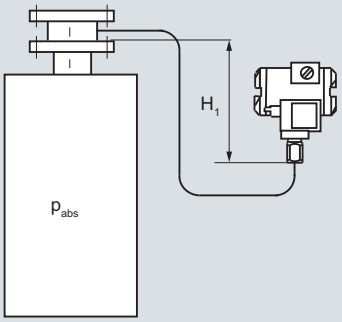
Full-scale: $p_{ME} = \rho_{FL} \cdot g \cdot H_O + \rho_{Oil} \cdot g \cdot H_1$

Legend

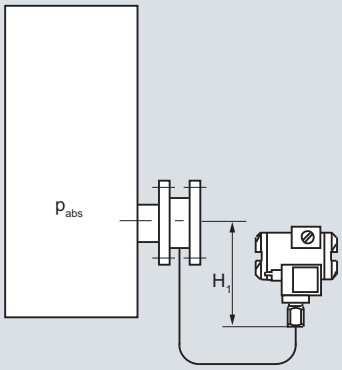
p_{MA}	Start-of-scale value to be set
p_{ME}	Full-scale value to be set
ρ_{FL}	Density of medium in vessel
ρ_{Oil}	Density of filling oil in the capillary to the remote seal
g	Local acceleration due to gravity
H_U	Start-of-scale value
H_O	Full-scale value
H_1	Distance between vessel flange and pressure trans.

Types of installation for absolute level measurements (closed vessels)

Installation type C_1



Installation type C_2



Pressure transmitter for absolute pressure always below the measuring point: $H_1 \geq 200$ mm (7.9 inch)

Installation type C_1 and C_2

Start-of-scale: $p_{MA} = p_{START} + \rho_{Oil} \cdot g \cdot H_1$

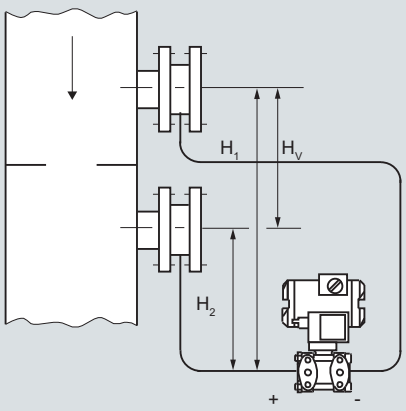
Full-scale: $p_{ME} = p_{END} + \rho_{Oil} \cdot g \cdot H_1$

Legend

p_{MA}	Start-of-scale value to be set
p_{ME}	Full-scale value to be set
p_{START}	Start-of-scale value
p_{END}	Full-scale value
ρ_{Oil}	Density of filling oil in the capillary to the remote seal
g	Local acceleration due to gravity
H_1	Distance between vessel flange and pressure trans.

Type of installation for differential pressure and flow measurements

Installation type D Filter monitoring



Installation type D

Start-of-scale: $p_{MA} = p_{START} - \rho_{Oil} \cdot g \cdot H_V$

Full-scale: $p_{ME} = p_{END} - \rho_{Oil} \cdot g \cdot H_V$

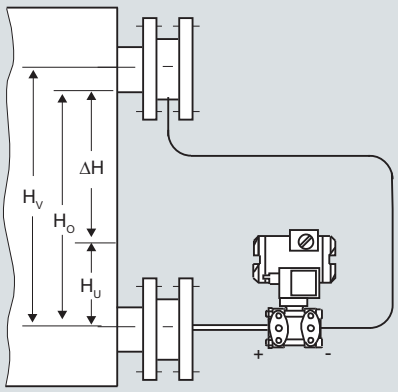
Legend

p_{MA}	Start-of-scale value to be set
p_{ME}	Full-scale value to be set
p_{START}	Start-of-scale value
p_{END}	Full-scale value
ρ_{Oil}	Density of filling oil in the capillary to the remote seal
g	Local acceleration due to gravity
H_V	Distance between the measuring points (spigots)

Measuring setups with remote seals

Types of installation for level measurements (closed vessels)

Installation type E



Installation type E

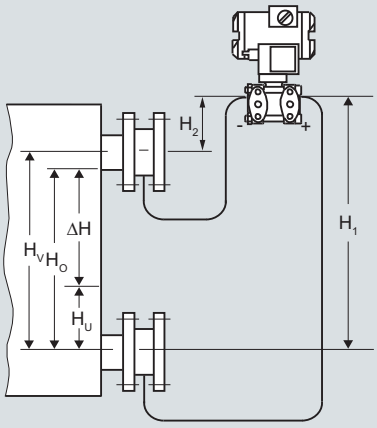
Start-of-scale: $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

Full-scale: $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$

Legend

p_{MA}	Start-of-scale value to be set
p_{ME}	Full-scale value to be set
ρ_{FL}	Density of medium in vessel
ρ_{Oil}	Density of filling oil in the capillary to the remote seal
g	Local acceleration due to gravity
H_U	Start-of-scale value
H_O	Full-scale value
H_V	Distance between the measuring points (spigots)

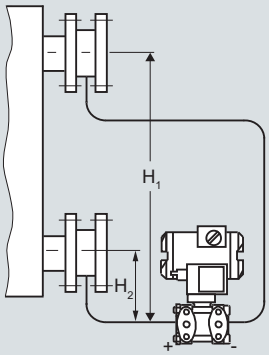
Installation type G



Pressure transmitter for differential pressure above the upper measuring point, no vacuum

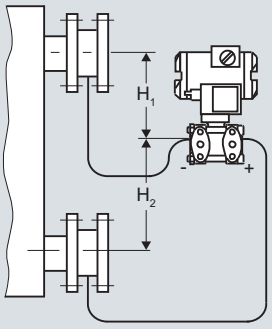
$H_1 \leq 7$ m (23 ft), with halocarbon oil as filling liquid only $H_1 \leq 4$ m (13.1 ft)

Installation type H



below the lower measuring point

Installation type J



between the measuring points, no vacuum

$H_2 \leq 7$ m (23 ft), with halocarbon oil as filling liquid only $H_2 \leq 4$ m (13.1 ft)

Installation type G, H and J

Start-of-scale: $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

Full-scale: $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$

Legend

p_{MA}	Start-of-scale value to be set
p_{ME}	Full-scale value to be set
ρ_{FL}	Density of medium in vessel
ρ_{Oil}	Density of filling oil in the capillary to the remote seal
g	Local acceleration due to gravity
H_U	Start-of-scale value
H_O	Full-scale value
H_V	Distance between the measuring points (spigots)

Overview

Notes

- For the separation layer measurement, the separation layer has to be positioned between the two spigots.

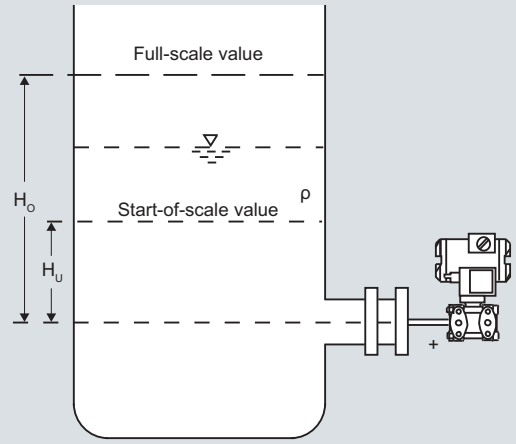
Also you must make sure that the level in the container is always above the top spigot.

- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot

Schematics

Pressure transmitters for differential pressure, for flanging

Measuring setups for open containers



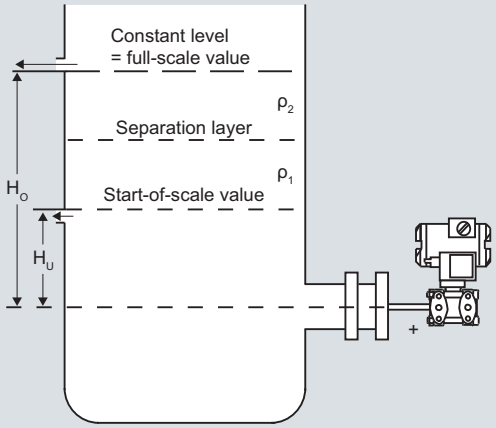
Level measurement

Start-of-scale: $p_{MA} = \rho \cdot g \cdot H_U$

Full-scale: $p_{ME} = \rho \cdot g \cdot H_O$

Legend

p_{MA}	Start-of-scale value to be set
p_{ME}	Full-scale value to be set
ρ	Density of medium in vessel
g	Local acceleration due to gravity
H_U	Start-of-scale value
H_O	Full-scale value



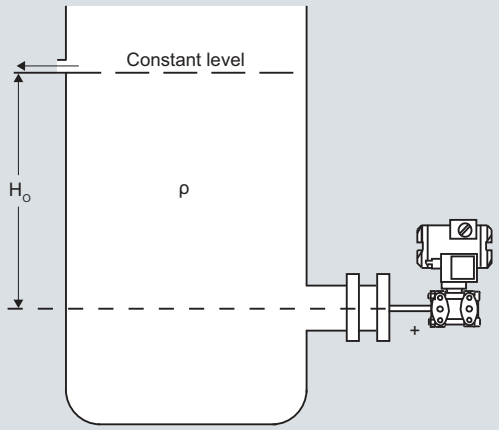
Separation layer measurement

Start-of-scale: $p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2)$

Full-scale: $p_{ME} = \rho_1 \cdot g \cdot H_O$

Legend

p_{MA}	Start-of-scale value to be set
p_{ME}	Full-scale value to be set
ρ_1	Density of heavier liquid
ρ_2	Density of lighter liquid
g	Local acceleration due to gravity
H_U	Start-of-scale value
H_O	Full-scale value



Density measurement

Start-of-scale: $p_{MA} = \rho_{MIN} \cdot g \cdot H_O$

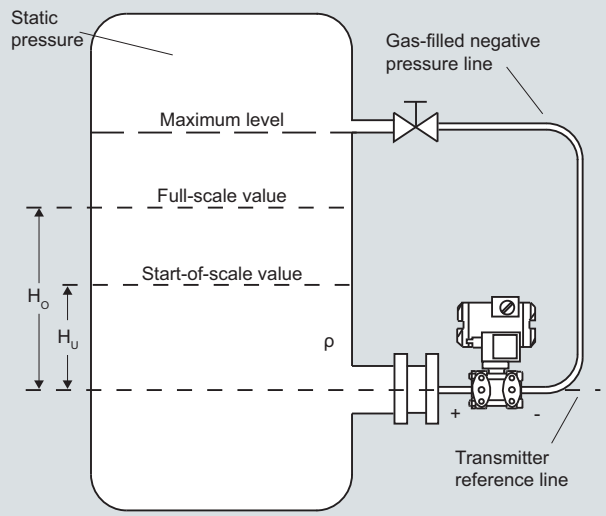
Full-scale: $p_{ME} = \rho_{MAX} \cdot g \cdot H_O$

Legende

p_{MA}	Start-of-scale value to be set
p_{ME}	Full-scale value to be set
ρ_{MIN}	Minimum density of medium in vessel
ρ_{MAX}	Maximum density of medium in vessel
g	Local acceleration due to gravity
H_O	Full-scale value in m

Measuring setups without remote seals

Measuring setups for closed containers



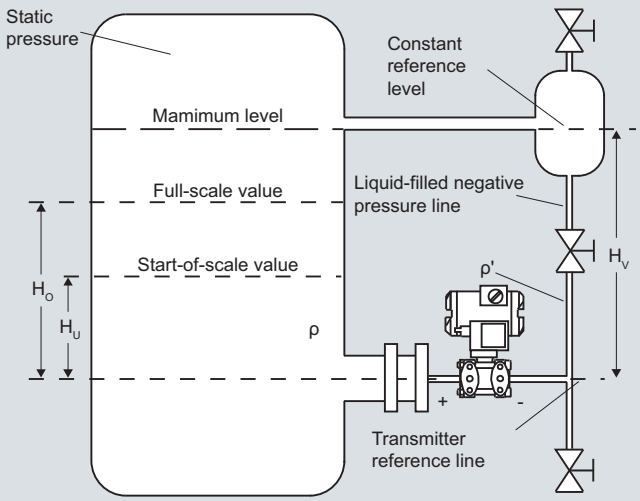
Level measurement, Version 1

Start-of-scale: $\Delta p_{MA} = \rho \cdot g \cdot H_U$

Full-scale: $\Delta pME = \rho \cdot g \cdot H_O$

Legend

Δp_{MA}	Start-of-scale value to be set
Δp_{ME}	Full-scale value to be set
ρ	Density of medium in vessel
g	Local acceleration due to gravity
H_U	Start-of-scale value
H_O	Full-scale value



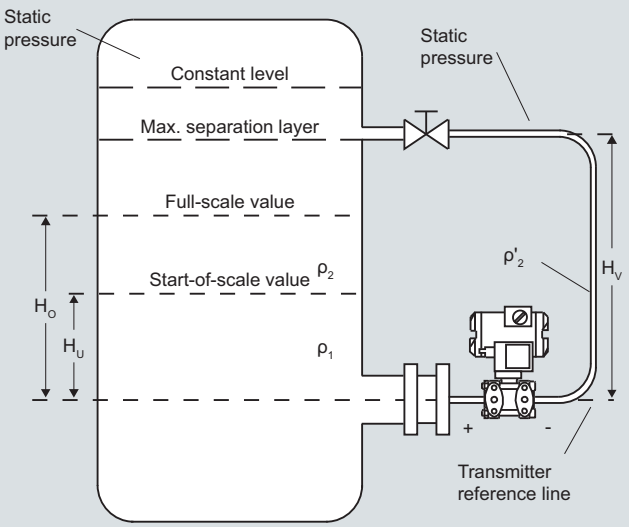
Level measurement, Version 2

Start-of-scale: $\Delta p_{MA} = g \cdot (H_U \cdot \rho - H_V \cdot \rho')$

Full-scale: $\Delta p_{ME} = g \cdot (H_O \cdot \rho - H_V \cdot \rho')$

Legend

Δp_{MA}	Start-of-scale value to be set
Δp_{ME}	Full-scale value to be set
ρ	Density of medium in vessel
ρ'	Density of liquid in the negative pressure line (corresponding to the temperature existing there)
g	Local acceleration due to gravity
H_U	Start-of-scale value
H_O	Full-scale value
H_V	Distance between the measuring points (spigots)



Separation layer measurement

Start-of-scale: $\Delta p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2 - H_V \cdot \rho'_2)$

Full-scale: $\Delta p_{ME} = g \cdot (H_O \cdot \rho_1 - H_V \cdot \rho'_2)$

Legend

Δp_{MA}	Start-of-scale value to be set
Δp_{ME}	Full-scale value to be set
ρ_1	Density of heavier liquid with separation layer in vessel
ρ_2	Density of lighter liquid with separation layer
ρ'_2	Density of liquid in the negative pressure line (corresponding to the temperature existing there)
g	Local acceleration due to gravity
H_U	Start-of-scale value
H_O	Full-scale value
H_V	Distance between the measuring points (spigots)

SIEMENS

Questionnaire (suitable for US market) for hydrostatic level measurements

Order date: _____

Processing date: _____

Ordering code (customer): _____

Ordering code (supplier): _____

Customer reference: _____

Measuring point: _____

Position: _____

Dimensions: _____

Pressure: ☐ psi

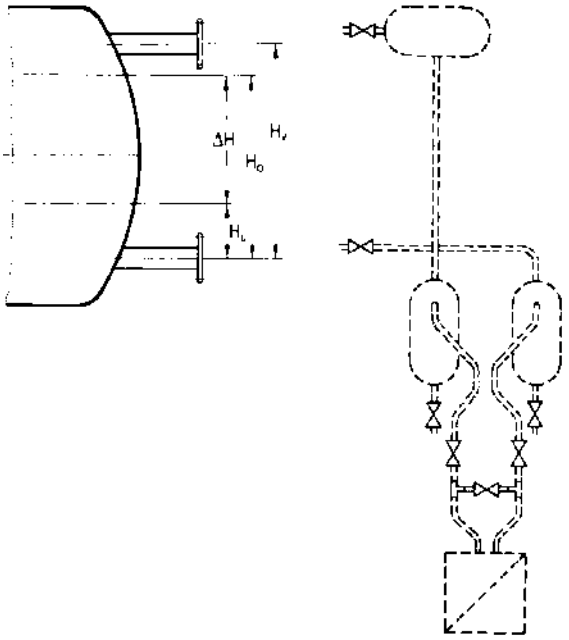
Temperature: ☐ K ☐ °F

Measuring range: ☐ inch ☐ ft
(please mark with cross)

Order No. of transmitter [1]:

7 M F _____ – _____ – _____ **–Z**

Y01



The different pressures and temperatures (densities) in the vessel and in the reference column result in an offset in the start-of-scale and full-scale values.
The calibration data are determined in addition.
It is also checked whether – as a result of the range offset – the ordered transmitter is suitable for this measurement.

Please supply the following characteristic data so that we can calculate the measuring range, start-of-scale value, full-scale value and calibration data:

Please mark type of boiler with a cross:
Closed [1] ☐
Open or not under pressure [2] ☐

Medium _____

Licensed boiler pressure (absolute)		_____ psi
Operating pressure (absolute)	Lowest	_____ psi
	Normal [3]	_____ psi
	Highest	_____ psi
Temperature of reference column (cold)		_____ °F
Distance between measuring points (dimension according to sketch)	H_V =	_____ ft
Measuring range [4] = start-of-scale value to full-scale value		
	Start-of-scale value	H_U = _____ ft
	Full-scale value	H_O = _____ ft
Position of equalizing vessel above bottom measuring point if different from H_V		_____ ft

Please mark pressure correction of level with a cross:
No ☐
Yes [4] ☐

[1] Reference line filled with condensation! Falling differential pressure with increasing level.
[2] Reference line without gas or filled with gas (air). Rising differential pressure with increasing level.
[3] If not specified otherwise, this value is assumed as the calculation pressure of the level meter. The input signal (differential pressure) depends on the density (pressure and temperature). The influence is practically negligible for a lowest liquid level of 20 to 30% of the distance between the measuring points.
[4] If a pressure correction of the level is required, the **measuring range must be the same as the distance between the measuring points**, and the transmitter is designed for the calculation pressure of 1 bar (absolute).
Pressure correction means: the static pressure and the temperature are measured separately and calculated by a correction computer or measured-value computer.

SIEMENS

Questionnaire (suitable for US market)

Checking of transmitter/remote seal combinations

* Customer:_____ Tag. No.: _____
* Plant: _____ Item No.: _____
* Ordering code:_____ Person responsible: _____
* Ordering department: _____ Phone: _____
* **Transmitter Order No.: 7MF ☐☐☐☐–1 ☐☐☐☐–1 ☐☐☐**

Order No. of transmitter known?

Yes

*** Order No. of remote seal:**
7MF 4 8 ☐☐ – ☐☐☐☐☐ – ☐☐ –Z
Suffixes _____
Suffixes _____

No

*** Or without Order No.: Process connection**

* Standard: _____
* Nominal diameter: _____
* Nominal pressure: _____
* Constructional design:
  - ☐ Pancake-type rem. seal
  - ☐ Flanged remote seal
  - ☐ Quick-release remote seal
  - ☐ Clamp-on seal
  - ☐ Other.: _____
* Connection:
  - ☐ Direct connection
  - ☐ Capillary on one side; connection to: ☐ + side ☐ – side
  - ☐ Capillaries on both sides;
  - ☐ Capillary length: ___ ft
* Vacuum-proof design ☐ Yes ☐ No
* Wetted parts materials: _____
* Tube: ☐ No ☐ Yes, __inch long
* Filling liquid _____
* Miscellaneous _____

Calculation of measuring range necessary?

No

*** Range to be set:**
(without calculation)
Start-of-scale:_____ psi (4 mA)
Full-scale: _____ psi (20 mA)

*** Required measuring accuracy:**
Error: < . % of set span per 18 °F change in temperature

Please fill in this questionnaire and enclose with every order!

Yes

Medium _____
Density of medium: _____ kg/m^3

*** Temperature of medium:**
Normal _____ °F
Minimum _____ °F
Maximum _____ °F

*** Ambient temperature on capillaries:**
Normal _____ °F
Minimum _____ °F
Maximum _____ °F

*** Ambient temperature on transmitter:**
Normal _____ °F
Minimum _____ °F
Maximum _____ °F

*** Operating pressure referred to absolute zero:** ____ psi$_{abs}$

* Does a **vacuum** occur **during startup**? ☐ No ☐ Yes
If yes, associated temperature of medium: _____ °F

*** Installation type**, see pages 2/211 and 2/212
☐ A ☐ B ☐ C_1 ☐ C_2 ☐ D
☐ E ☐ G ☐ H ☐ J

*** Measuring range:**
With install. types A, B, C_1, C_2 and D: from ___ to ___ psi
With install. types A, B, G, H and J: H_U = ___ inch; H_O = ___ inch

*** Dimensions:**
With install. types A, B, C_1 and C_2: H_1 = ___ inch
With install. types D, G, H and J: H_V = ___ inch

*** Start-of-scale value following calculation:** _____ psi (4 mA)
Full-scale value following calculation: _____ psi (20 mA)
Associated span: _____ psi
Error to be expected: < , % of set span per 18 °F change in temperature

Checked: Name:
Department:
Date:

***) Values must be entered here!**

Overview

All shut-off fittings can be secured onto walls, racks (72 mm grid) and vertical and horizontal pipes.

This offers the advantage when assembling a plant that the shut-off fittings can be secured first and the lines for the medium and differential pressure connected to them. It is then possible to check all connections for leaks and to blow out or flush the pipes in order to remove dirt (welding residues, shavings etc.).

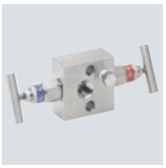
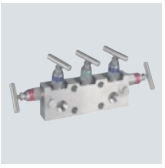
The measuring instruments can be screwed onto the shut-off fittings right at the end when all piping has been completed.

If an instrument has to be removed for maintenance, the fittings and pipes remain as they are. It is only necessary to close the valves – the instrument can then be removed, and refitted following maintenance.

Material acceptance test certificate to EN 10204-3.1

If a material acceptance test certificate to EN 10204-3.1 is required when ordering valve manifolds or shut-off fittings, please note that a single certificate is sufficient for each ordered item type. This means that you will only be charged for one certificate in the cost calculations.

Selection of available shut-off valves

Transmitters	Shut-off valves for general applications	Page		Shut-off valves for special applications	Page	
Relative and absolute pressure transmitters with process connection G½" male thread e.g. • SITRANS P200 7MF1565-... • SITRANS P210 7MF1566-... • SITRANS P220 7MF1567-... • SITRANS P300 7MF802.-...0.-.... • SITRANS P DS III series 7MF403.-...0.-.... and 7MF423.-...0.-....				Double shut-off valve DN 5 for crossover ½-NPT-F to G½ nipple connection 7MF9011-4EA	2/218	
Relative and absolute pressure transmitter with G½"-14 NPT female thread e.g. • SITRANS P200 7MF1565-... • SITRANS P210 7MF1566-... • SITRANS P220 7MF1567-... • SITRANS P300 7MF802.-...1.-.... • SITRANS P DS III series 7MF403.-...1.-.... and 7MF423.-...1.-....	Double shut-off valve DN 5 7MF9011-4FA and 7MF9011-4GA	2/218		Double shut-off valve DN 5 for process connection ½-NPT 7MF9011-4DA	2/218	
Absolute pressure transmitter with process connection to IEC 61518 e.g. • SITRANS P DS III series 7MF433.-...	2-spindle valve manifold DN 5 7MF9411-5A.	2/219				
Differential pressure transmitter with process connection to IEC 61518 e.g. • SITRANS P DS III series 7MF443.-... and 7MF453.-... • SITRANS P500 7MF54..-...	For 3-/5-spindle valve manifold DN 5 7MF9411-5B. and 7MF9411-5C.	2/219	 			

Double shut-off valves

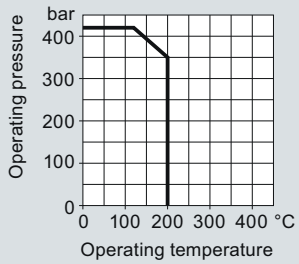
2

Overview

The double shut-off valves DN 5 are suitable for pressure gauges and pressure transmitters and available in 4 versions:

- Sleeve-collar
- Sleeve-sleeve
- Sleeve-nipple
- Collar-collar

Characteristic curves

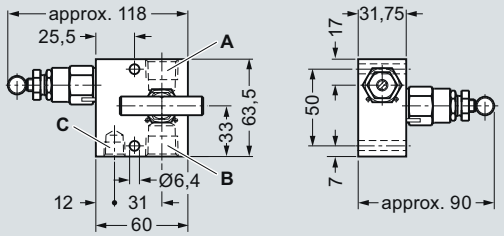


420 bar at 120 °C
350 bar at 200 °C

Permissible operating pressure as a function of the permissible operating temperature

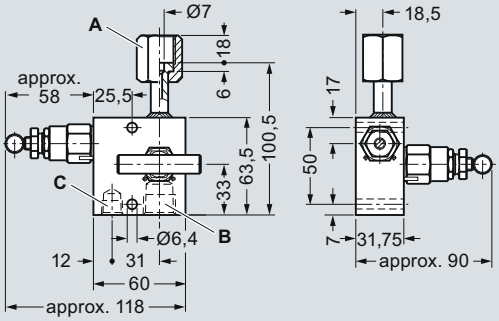
Selection and Ordering data	Order No.
Double shut-off valves DN 5	
Material: X 6 CrNiMoTi 17 13 2 (mat. No. 1.4404/316L), max. permissible working pressure 420 bar (6092 psi)	
• Sleeve-sleeve	**7MF9011-4DA**
• Sleeve-nipple connection	**7MF9011-4EA**
• Sleeve-collar	**7MF9011-4FA**
• Collar-collar	**7MF9011-4GA**
Double shut-off valve acc. ASME B31.1, max. permissible working pressure class 2500	
• Sleeve-collar	**7MF9011-4FB**
Accessories	
Factory test certificate EN 10204–2.2	**7MF9000-8AB**
Material acceptance test certificate EN 10204-3.1	**7MF9000-8AD**
Further designs	Order code
Add "**-Z**" to Order No. and specify Order Code.	
Oil- and grease-free cleaning for oxygen cleaning applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F)	**S12**

Dimensional drawings



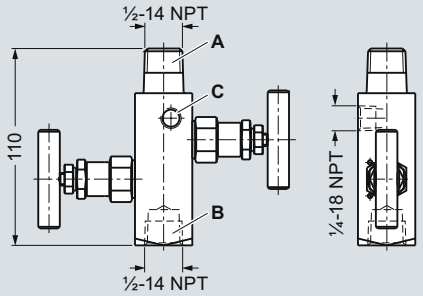
A Connection on device side : ½-14 NPT
B Connection on measurement side: ½-14 NPT
C Vent and test connection: ¼-18 NPT

Double shut-off valve DN 5 (sleeve-sleeve) 7MF9011-4DA, dimensions in mm



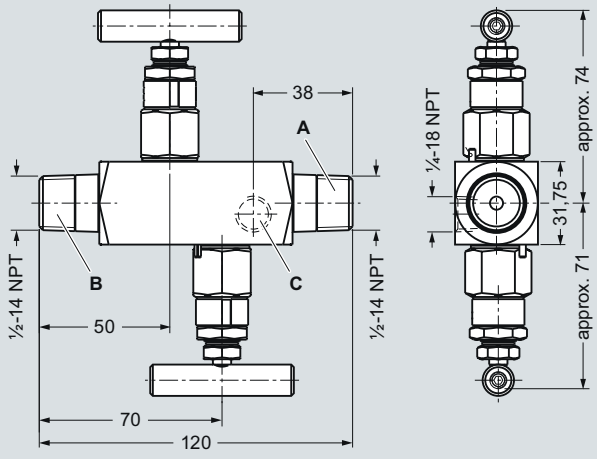
A Connection on device side: nipple to DIN 16284, G½, SW 27
B Connection on measurement side: ½-14 NPT
C Vent and test connection: ¼-18 NPT

Double shut-off valve DN 5 (sleeve-nipple) 7MF9011-4EA, dimensions in mm



A Connection on device side : ½-14 NPT
B Connection on measurement side: ½-14 NPT
C Vent and test connection: ¼-18 NPT

Double shut-off valve DN 5 (sleeve-collar) 7MF9011-4FA, dimensions in mm



A Connection on device side : ½-14 NPT
B Connection on measurement side: ½-14 NPT
C Vent and test connection: ¼-18 NPT

Double shut-off valve DN 5 (collar-collar) 7MF9011-4GA, dimensions in mm

Overview

The 2-spindle, 3-spindle and 5-spindle valve manifolds 7MF9411-5.. are for pressure transmitters for absolute pressure or differential pressure.

The valve manifolds are used to shut off the differential pressure lines and to check the pressure transmitter zero.

The 2-spindle and the 5-spindle valve manifold enable in addition venting on the transmitter side and checking of the pressure transmitter characteristic.

Benefits

- Max. working pressure 420 bar (6092 psi)
- Each available in version for oxygen

Application

The spindle valve manifolds DN 5 are designed for liquids and gases.

Each is available in a version for oxygen on request.

Design

All versions of the valve manifolds have a process connection ½-14 NPT. The connection for the pressure transmitter is always designed as a flange connection to EN 61518, form B . The 2-spindle and the 5-spindle valve manifold have in addition a vent and test connection ¼-18 NPT.

The valves have an external spindle thread.

Materials used

Component	Material	Mat. No.
Housing	X 2 CrNiMo 17 13 2	1.4404/316L
Cones	X 6 CrNiMoTi 17 12 2	1.4571/316Ti
Spindles	X 2 CrNiMo 18 10	1.4404/316L
Head parts	X 5 CrNiMo 18 10	1.4401/316
Packings	PTFE	-

Function

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

Additional functions of the 2-spindle and 5-spindle valve manifolds through the vent and test connection:

- Venting on the transmitter side
- Checking the pressure transmitter characteristic

Selection and Ordering data

Selection and Ordering data	Order No.
Valve manifolds DN 5 for liquids and gases, for flanging to pressure transmitters for absolute and differential pressure, max. working pressure 420 bar (6092 psi) (order accessory set with Order code), without certificate	**7 M F 9 4 1 1 - ■ ■ A**
• 2-spindle valve manifold	**5 A**
• 3-spindle valve manifold	**5 B**
• 5-spindle valve manifold	**5 C**
Valve manifold acc. ASME B31.1, max. permissible working pressure class 2500	
• 3-spindle valve manifold	**8 B**
• 5-spindle valve manifold	**8 C**
Accessories	
Factory test certificate EN 10204–2.2	**7MF9000-8AB**
Material acceptance test certificate EN 10204-3.1	**7MF9000-8AD**

Selection and Ordering data	Order code	Order No.
Further designs[1)] Please add "**-Z**" to Order No. and specify Order code.		
Accessory set to EN (connection between valve manifold and pressure transmitter) for valve manifold 7MF9411-5A.		
2x screws $^{7}/_{16}$-20 UNF x 1¾ inch to ASME B18.2.1; chromized steel 1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**K35**	**7MF9411-7DB**
2x screws $^{7}/_{16}$-20 UNF x 1¾ inch to ASME B18.2.1; **stainless steel** 1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**K45**	**7MF9411-7DC**
for valve manifold 7MF9411-5B. and -5C.		
4x screws $^{7}/_{16}$-20 UNF x 1¾ inch to ASME B18.2.1; chromized steel 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**K36**	**7MF9411-5DB**
4x screws $^{7}/_{16}$-20 UNF x 1¾ inch to ASME B18.2.1; **stainless steel** 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**K46**	**7MF9411-5DC**

2-, 3- and 5-spindle valve manifolds DN 5

Selection and Ordering data	Order code	Order No.
Further designs[1]		
Please add "**-Z**" to Order No. and specify Order code.		
Accessory set to DIN[2] (connection between valve manifold and pressure transmitter) for valve manifold 7MF9411-5A.		
2x screws M10x45 to DIN EN 24014; chromized steel, 2x washers Ø 10.5 mm to DIN 125; 1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**K15**	**7MF9411-7BB**
2x screws M10x45 to DIN EN 24014; **stainless steel** 2x washers Ø 10.5 mm to DIN 125, **stainless steel**; 1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F) for valve manifolds 7MF9411-5B. and -5C.	**K25**	**7MF9411-7BC**
4x screws M10x45 to DIN EN 24014; chromized steel, 4x washers Ø 10.5 mm to DIN 125; 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F) Flange connection with M10 screws only permissible up to PN 160.	**K16**	**7MF9411-6BB**
4x screws M10x45 to DIN EN 24014; **stainless steel** 4x washers Ø 10.5 mm to DIN 125, **stainless steel**; 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F) Flange connection with M10 screws only permissible up to PN 160.	**K26**	**7MF9411-6BC**
Mounting plate		
• for valve manifold, made of electrogalvanized sheet-steel		
- **for wall mounting** or for securing on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 mounting plate with bolts for mounting on valve manifold	**M11**	**7MF9006-6EA**
- **for pipe mounting,** weight 0.7 kg Scope of delivery: 1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)	**M12**	**7MF9006-6GA**
• for valve manifold, made of **stainless steel**		
- **for wall mounting** or for securing on rack (72 mm grid), weight 0.5 kg Scope of delivery: 1 mounting plate with bolts for mounting on valve manifold	**M21**	**7MF9006-6EC**
- **for pipe mounting,** weight 0.7 kg Scope of delivery: 1x mounting plate M11, 2x pipe brackets with nuts and washers (for pipe with max. Ø 60.3 mm)	**M22**	**7MF9006-6GC**
Valve manifold 100 bar Oil- and grease-free cleaning for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F)		
• for 7MF9411-5A.	**S12**	
• for 7MF9411-5B.	**S13**	
• for 7MF9411-5C.	**S14**	

1) When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Order No.
2) Flange connections to DIN 19213 only permissible up to 160!

Accessories

Accessory set for 2-, 3- and 5-spindle valve manifolds

2-spindle valve manifold DN 5

- K35: 2 screws $^{7}/_{16}$-20 UNF x 1¾ inch to ASME B18.2.1, 1 flat gasket
- K15: 2 screws M10x45 to DIN EN 24014, 2 washers, 1 flat gasket

3-spindle and 5-way valve manifold DN 5

- K36: 4 screws $^{7}/_{16}$-20 UNF x 1¾ inch to ASME B18.2.1, 2 flat gaskets
- K16: 4 screws M10x45 to DIN EN 24014, 4 washers, 2 flat gaskets

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

Note: Flange connection with M10 screws only permissible up to PN 160!

Mounting plate

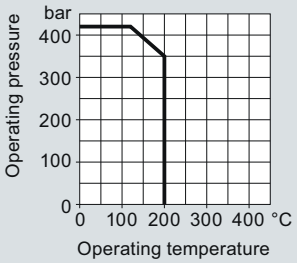
Made of electrogalvanized sheet-steel

- M11: For wall mounting or for securing on rack (72 mm grid) Scope of delivery:
  - 1 mounting plate with bolts for mounting on valve manifold
- M12: For pipe mounting Scope of delivery:
  - 1 mounting plate M11
  - 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm

Valve manifold 100 bar, suitable for oxygen

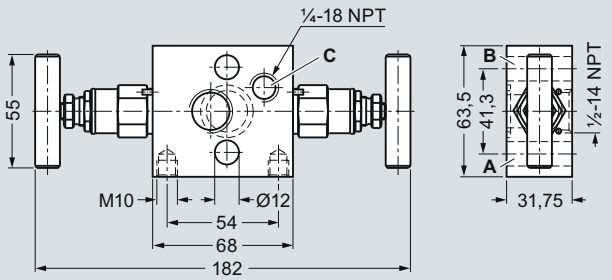
- S12: For 2-way valve manifold
- S13: For 3-way valve manifold
- S14: For 5-way valve manifold

Characteristic curves



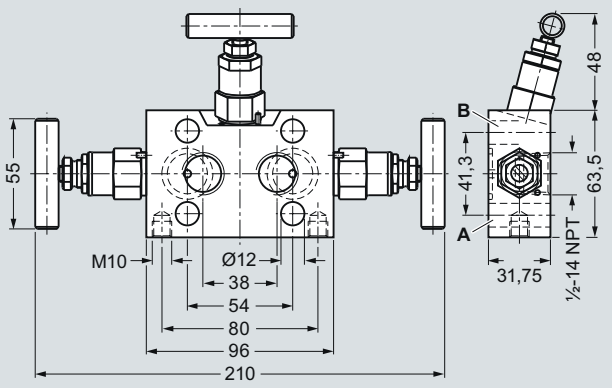
Valve manifolds PN 5 (7MF9411-5..), permissible working pressure as a function of the permissible working temperature

Dimensional drawings



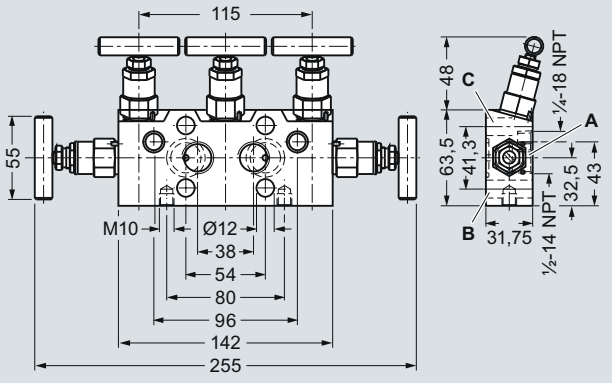
A Process connection: ½-14 NPT
B Transmitter connection: Flange connection to EN 61518, form B
C Vent / test connection: ¼-18 NPT
Valve design: external spindle thread

2-spindle valve manifold DN 5 (7MF9411-5A.), dimensions in mm



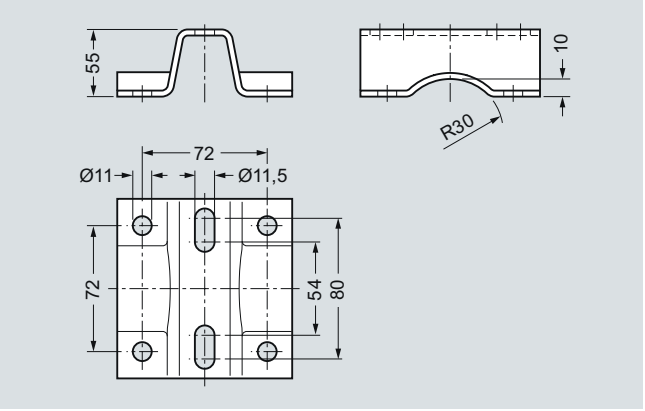
A Process connection: ½-14 NPT
B Transmitter connection: Flange connection to EN 61518, form B
Valve design: external spindle thread

3-spindle valve manifold DN 5 (7MF9411-5B.), dimensions in mm



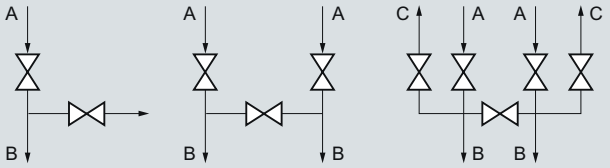
A Process connection: ½-14 NPT
B Transmitter connection: Flange connection to EN 61518, form B
C Vent / test connection: ¼-18 NPT
Valve design: external spindle thread

5-spindle valve manifold DN 5 (7MF9411-5C.), dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

Schematics



A Process connection
B Transmitter connection
C Blow-out and test connection

2-spindle, 3-spindle and 5-spindle valve manifold DN 5, connections

Oval flange

Overview

The oval flange 7MF9408-2C. for pressure transmitters for absolute pressure and differential pressure has a ½-14 NPT female thread and is designed for max. operating pressure 400 bar.

Accessories

Accessory set for oval flange

- E36: 2 screws $^{7}/_{16}$-20 UNF x 1½ inch to ASME B18.2.1, 1 flat gasket
- E34: 2 screws $^{7}/_{16}$-20 UNF x 1½ inch to ASME B18.3, 1 O-ring (FPM 90)
- E13: 2 screws M10x40 to DIN EN 4762, 2 washers, 1 O-ring (FPM 90)
- E16: 2 screws M10x40 to DIN EN ISO 4762, 2 washers, 1 flat gasket

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. 420 bar (6092 psi), 80 °C (176 °F)

O-ring to DIN 3771, 20 x 2.65 – S – FPM90, max. 420 bar, 120 °C

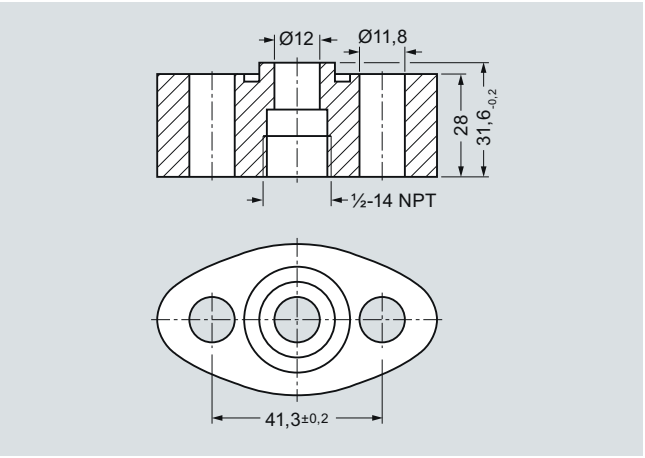
Note: M10 screws only permissible up to PN 160!

Selection and Ordering data	Order No.
Oval flange with female thread ½-14 NPT, max. working pressure 420 bar (6092 psi) flange connection to DIN EN 61518, form A	
Material	
P250GH, mat. No.: 1.0460	**7MF9408-2CE**
X 2 CrNiMo 17 13 2, mat. No. 1.4404/316L	**7MF9408-2CL**

Selection and Ordering data	Order code	Order No.
Further designs[1] Please add "**-Z**" to Order No. and specify Order code.		
Accessory set to EN		
2x screws $^{7}/_{16}$-20 UNF x 1½ inch to ASME B 18.2.3; chromized steel 1x flat gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**E36**	**7MF9408-5DA**
2x screws $^{7}/_{16}$-20 UNF x 1½ inch to ASME B 18.2.3; chromized steel 1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissble 420 bar (6092 psi), 120 °C (248 °F)	**E34**	**7MF9408-5CA**
Accessory set to DIN		
2x screws M10x40 to DIN EN ISO 4762; chromized steel 2x washers Ø 10.5 mm to DIN 125; 1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissble 420 bar (6092 psi), 120 °C (248 °F)[2]	**E13**	**7MF9408-6AA**
2x screws M10x40 to DIN EN ISO 4762; chromized steel 2x washers Ø 10.5 mm to DIN 125; 1x flat gasket made of PTFE, max. permissible 80 °C (176 °F)[2]	**E16**	**7MF9408-6BA**

[1] When ordering accessory set together with the oval flange, please use Order code; otherwise use Order No.
[2] Flange connections with M10 screws only permissible up to PN 160

Dimensional drawings



Oval flange 7MF9408-2C., dimensions in mm