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

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Overview

	Application	Description		Software for parameterization
SITRANS P Single-range transmitters for general applications				
	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	1/6	–
		SITRANS P210 • Single-range transmitters for gauge pressure • Stainless steal measuring cell • For low-pressure applications	1/12	–
		SITRANS P220 • Single-range transmitters for gauge pressure • Stainless steel measuring cell, fully welded • For high-pressure applications and refrigeration technology	1/17	–
	Two-wire transmitter for measuring hydrostatic levels	**SITRANS LH100** • For measuring liquid levels in wells, tanks, channels, dams etc. • With ceramic diaphragm, Ø 23.4 mm	1/23	–
	Two-wire transmitter for measuring hydrostatic levels	**SITRANS LH300** • For measuring liquid levels in wells, tanks, channels, dams etc. • With ceramic diaphragm, Ø 30 mm • Suitable for small measuring ranges	1/28	–
	Transmitters for gauge and absolute pressure for food, pharmaceuticals and biotechnology	**SITRANS P Compact** • Single-range transmitters in two-wire system • Hygiene-based design with various aseptic connections according to EHEDG, FDA and GMP recommendations.	1/34	–
SITRANS P · Transmitters for food, pharmaceuticals and biotechnology				
	Two-wire transmitters for measuring gauge and absolute pressure	**SITRANS P300** • Hygiene-based design according to EHEDG, 3A, FDA and GMP • Parameterization using 3 buttons and communication over HART, PROFIBUS PA or FOUNDATION Fieldbus • Standard process connection G½", ½-NPT and front-flush process connections available • Measuring range adjustment 100 : 1	1/43	SIMATIC PDM
		Factory-mounting of valve manifolds on SITRANS P300 transmitters • Simplified assembly • With pressure test • Stainless steel valve manifolds	1/66	–
SITRANS P · Transmitters for gauge pressure for the paper industry				
	Two-wire transmitters for measuring gauge pressure	**SITRANS P300 and SITRANS P DS III with PMC connection for the paper industry** • Measuring range adjustment 100 : 1 • Process connections for the paper industry • Parameterization using 3 buttons and HART, PROFIBUS PA or FOUNDATION Fieldbus	1/68	SIMATIC PDM

	Application	Description		Software for parameterization
SITRANS P Transmitters for applications with advanced requirements (Advanced)				
	Two-wire transmitters for measuring: • Gauge pressure, • Absolute pressure, • Differential pressure and • Flow or • Level	**SITRANS P320/P420** • Measuring accuracy: - SITRANS P320: 0.065 % - SITRANS P420 0.04 % • Fast step response time of up to 105 ms • Developed according to IEC 61508, SIL2/3 applications • SIL validation remotely • Diagnostics according to Namur NE107 • 4-key operation	1/86	SIMATIC PDM
	Two-wire transmitters for measuring: • Gauge pressure, • Absolute pressure, • Differential pressure and • Flow or • Level	**SITRANS P DS III** • Measuring accuracy up to 0.065 % • Measuring range adjustment: 100 : 1 • Parameterization using: - 3 buttons and HART for SITRANS P DS III HART - 3 buttons and PROFIBUS PA for SITRANS P DS III PA series - 3 buttons and FOUNDATION Fieldbus for SITRANS P DS III FF series • Available ex stock	1/166	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	1/253	–
	Two-wire transmitters for measuring: • Gauge pressure, • Differential pressure and • Flow	**SITRANS P410** • Measuring accuracy up to 0.04 % • Measuring range adjustment 100 : 1 • Parameterization using: - 3 buttons and HART for SITRANS P410 HART - 3 buttons and PROFIBUS PA for SITRANS P410 PA - 3 buttons and FOUNDATION Fieldbus for SITRANS P410 FF	1/257	SIMATIC PDM
		Factory mounting of valve manifolds on gauge, absolute or differential pressure transmitters SITRANS P410 • Factory valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/253).		–
SITRANS P - Transmitters for applications with highest requirements (Premium)				
	Two-wire transmitters for measuring: • Differential pressure • Volume flow • Mass flow • Level • Volume • Mass	**SITRANS P500** • Measuring accuracy up to 0.03 % • Measuring range adjustment: 200 :1 • High measuring accuracy • Very fast response time • Extremely good long-term stability • Parameterization using 3 buttons or HART	1/297	SIMATIC PDM
		Factory-mounting of manifolds on differential pressure transmitters SITRANS P500 • Simplified assembly • With pressure test • Stainless steel valve manifolds	1/321	–

	Application	Description		Software for parameterization
Remote seals for transmitters SITRANS P				
	Remote seals for measuring viscous, corrosive or fibrous media (as well as media at extreme temperatures)	Remote seals for SITRANS P320/420	1/324	–
		Remote seals for SITRANS P300, P DS III, P410, P500	1/401	
		• Remote seals in sandwich and flange designs		
		• Quick-release remote seals for the food industry		
		• Wide range of diaphragm materials and fill fluid available		
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	1/440	–
		As accessory for fittings are available:		
		• Oval flange	1/473	
		• Adapters	1/474	
		• Connection glands	1/475	
		• Connection parts G½	1/476	
		• Water traps	1/477	
		• Sealing rings to EN 837-1	1/477	
		• Pressure surge reducers	1/478	
		• Primary shut-off valves	1/479	
		• Compensation vessels	1/481	
		• Connection parts	1/482	

Supplied product documentation on DVD and safety instructions

The scope of delivery of the Siemens products for process instrumentation includes a multilingual instruction sheet with **safety instructions** as well as a uniform **mini DVD – Process Instrumentation and Weighing Systems**.

This DVD contains the most important manuals and certificates for the Siemens process instrumentation and weighing technology portfolio. The delivery may also contain product-specific or order-specific printed materials.

For additional information, refer to the Annex on page 10/3.

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 device plug M12 (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

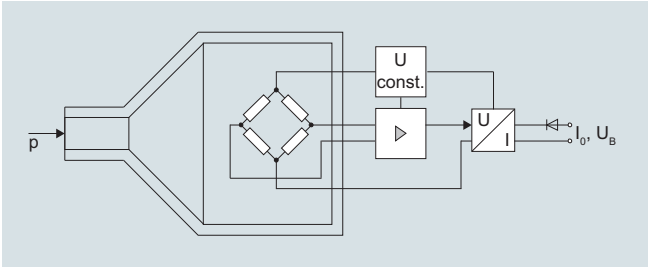
Device structure with explosion protection

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 device 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 thick-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 psi apsi a) 10 … 300 psi a
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
Ratiometric output	0 ... 90 %
• Load	≥ 10 kΩ
• Auxiliary power U_B	5 V DC ± 10 %
• 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 measuring span • Maximum: 0.5 % of measuring span
Step response time T_{99}	< 5 ms
Long-term stability	
• Lower range value and measuring span	0.25 % of measuring span/year
Influence of ambient temperature	
• Lower range value and measuring span	0.25 %/10 K of measuring span
• Influence of power supply	0.005 %/V
Operating conditions	
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 ... +125 °C (-40 ... +257 °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 device plug M12 • IP 67 with cable • IP 67 with cable quick screw connection
Electromagnetic compatibility	• acc. IEC 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 dimension drawings
Electrical connections	• Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or ½-14 NPT or Pg 11 • Device plug M12 • 2 or 3-wire (0.5 mm^2) cable (∅ ± 5.4 mm) • Quickon 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 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Lloyd's Register of Shipping (LR)[1]	12/20010
Germanischer Lloyd (GL)[1]	GL19740 11 HH00
American Bureau of Shipping (ABS)[1]	ABS_11_HG 789392_PDA
Bureau Veritas (BV)[1]	BV 271007A0 BV
Det Norske Veritas (DNV)[1]	A 12553
Drinking water approval (ACS)[1]	ACS 15 ACC NY 360
EAC[1]	№ ТС RU C-DE.ГБ05.В.00732 ОС НАНИО «ЦСВЭ»
Underwriters Laboratories (UL)[1]	
• for USA and Canada	UL 20110217 - E34453
• worldwide	IEC UL DK 21845
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

[1] For variants with output signal 0 ... 5 V and ratiometric output available soon.

SITRANS P200 for gauge and absolute pressure

Selection and ordering data | Article No. | Order code

SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications ↗ 7MF1565-■■■■■-■■■■ ■■■

Characteristic curve deviation typ. 0.25 %

Wetted parts materials: Ceramic and stainless steel + sealing material

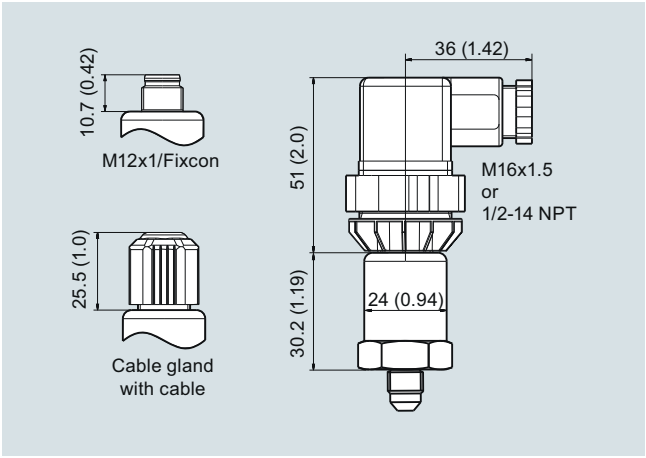
Non-wetted parts materials: stainless steel

↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

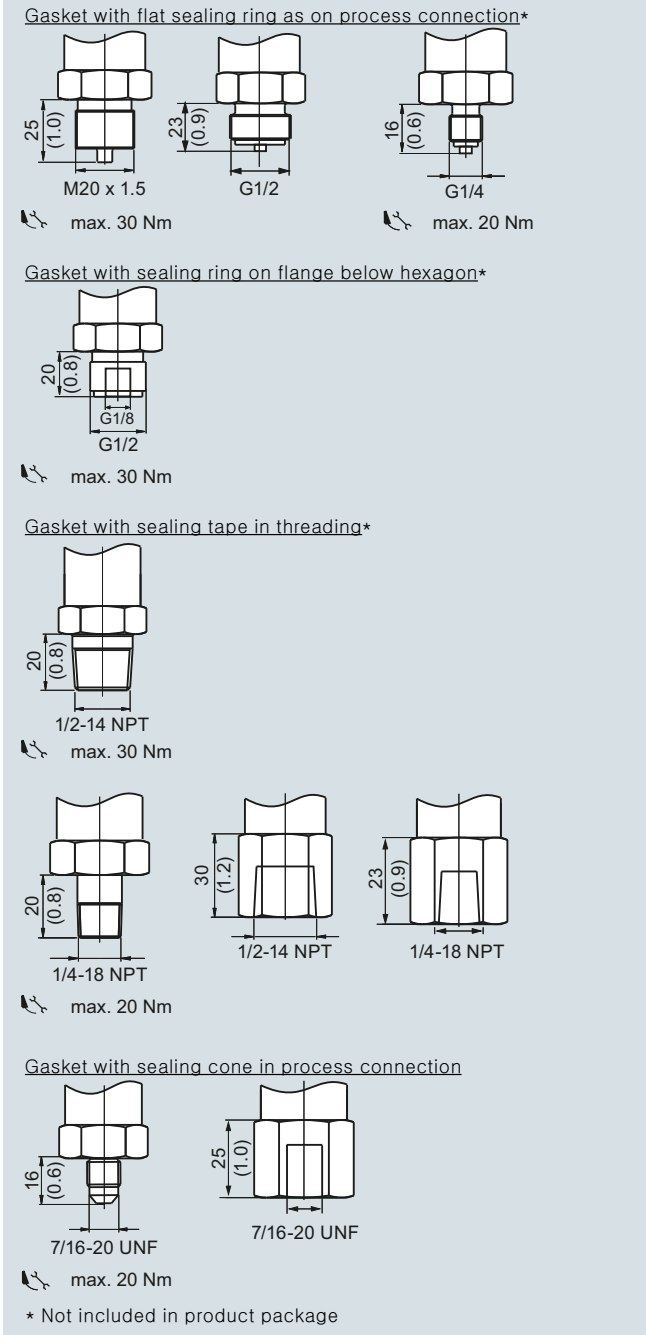
Measuring range		Overload limit Min.		Overload limit Max.		Burst pressure		Article No.	Order code
For gauge pressure									
0 ... 1 bar	(0 ... 14.5 psi)	-1 bar	(-14.5 psi)	2.5 bar	(36.26 psi)	> 2.5 bar	(> 36.3 psi)	3BA	
0 ... 1.6 bar	(0 ... 23.2 psi)	-1 bar	(-14.5 psi)	4 bar	(58.02 psi)	> 4 bar	(> 58.0 psi)	3BB	
0 ... 2.5 bar	(0 ... 36.3 psi)	-1 bar	(-14.5 psi)	6.25 bar	(90.65 psi)	> 6.25 bar	(> 90.7 psi)	3BD	
0 ... 4 bar	(0 ... 58.0 psi)	-1 bar	(-14.5 psi)	10 bar	(145 psi)	> 10 bar	(> 145 psi)	3BE	
0 ... 6 bar	(0 ... 87.0 psi)	-1 bar	(-14.5 psi)	15 bar	(217 psi)	> 15 bar	(> 217 psi)	3BG	
0 ... 10 bar	(0 ... 145 psi)	-1 bar	(-14.5 psi)	25 bar	(362 psi)	> 25 bar	(> 362 psi)	3CA	
0 ... 16 bar	(0 ... 232 psi)	-1 bar	(-14.5 psi)	40 bar	(580 psi)	> 40 bar	(> 580 psi)	3CB	
0 ... 25 bar	(0 ... 363 psi)	-1 bar	(-14.5 psi)	62.5 bar	(906 psi)	> 62.5 bar	(> 906 psi)	3CD	
0 ... 40 bar	(0 ... 580 psi)	-1 bar	(-14.5 psi)	100 bar	(1450 psi)	> 100 bar	(> 1450 psi)	3CE	
0 ... 60 bar	(0 ... 870 psi)	-1 bar	(-14.5 psi)	150 bar	(2175 psi)	> 150 bar	(> 2175 psi)	3CG	
Other version, add Order code and plain text: Measuring range: ... up to... bar (psi)								9AA	H1Y
For absolute pressure									
0 ... 0.6 bar a	(0 ... 8.7 psi a)	0 bar a	(0 psi a)	2.5 bar a	(36.26 psi a)	> 2.5 bar a	(> 36.3 psi a)	5AG	
0 ... 1 bar a	(0 ... 14.5 psi a)	0 bar a	(0 psi a)	2.5 bar a	(36.26 psi a)	> 2.5 bar a	(> 36.3 psi a)	5BA	
0 ... 1.6 bar a	(0 ... 23.2 psi a)	0 bar a	(0 psi a)	4 bar a	(58.02 psi a)	> 4 bar a	(> 58.0 psi a)	5BB	
0 ... 2.5 bar a	(0 ... 36.3 psi a)	0 bar a	(0 psi a)	6.25 bar a	(90.65 psi a)	> 6.25 bar a	(> 90.7 psi a)	5BD	
0 ... 4 bar a	(0 ... 58.0 psi a)	0 bar a	(0 psi a)	10 bar a	(145 psi a)	> 10 bar a	(> 145 psi a)	5BE	
0 ... 6 bar a	(0 ... 87.0 psi a)	0 bar a	(0 psi a)	15 bar a	(217 psi a)	> 15 bar a	(> 217 psi a)	5BG	
0 ... 10 bar a	(0 ... 145 psi)	0 bar a	(0 psi a)	25 bar a	(362 psi a)	> 25 bar a	(> 362 psi a)	5CA	
0 ... 16 bar a	(0 ... 232 psi)	0 bar a	(0 psi a)	40 bar a	(580 psi a)	> 40 bar a	(> 580 psi a)	5CB	
Other version, add Order code and plain text: Measuring range: ... up to ... mbar a (psi a)								9AA	H2Y
Measuring ranges for gauge pressure									
	0 ... 15 psi		-14.5 psi		35 psi		> 35 psi	4BB	
	3 ... 15 psi		-14.5 psi		35 psi		> 35 psi	4BC	
	0 ... 20 psi		-14.5 psi		50 psi		> 50 psi	4BD	
	0 ... 30 psi		-14.5 psi		80 psi		> 80 psi	4BE	
	0 ... 60 psi		-14.5 psi		140 psi		> 140 psi	4BF	
	0 ... 100 psi		-14.5 psi		200 psi		> 200 psi	4BG	
	0 ... 150 psi		-14.5 psi		350 psi		> 350 psi	4CA	
	0 ... 200 psi		-14.5 psi		550 psi		> 550 psi	4CB	
	0 ... 300 psi		-14.5 psi		800 psi		> 800 psi	4CD	
	0 ... 500 psi		-14.5 psi		1400 psi		> 1400 psi	4CE	
	0 ... 750 psi		-14.5 psi		2000 psi		> 2000 psi	4CF	
	0 ... 1000 psi		-14.5 psi		2000 psi		> 2000 psi	4CG	
Other version, add Order code and plain text: Measuring range: ... up to ... psi								9AA	H1Y
Measuring ranges for absolute pressure									
	0 ... 10 psi a		0 psi a		35 psi a		> 35 psi a	6AG	
	0 ... 15 psi a		0 psi a		35 psi a		> 35 psi a	6BA	
	0 ... 20 psi a		0 psi a		50 psi a		> 50 psi a	6BB	
	0 ... 30 psi a		0 psi a		80 psi a		> 80 psi a	6BD	
	0 ... 60 psi a		0 psi a		140 psi a		> 140 psi a	6BE	
	0 ... 100 psi a		0 psi a		200 psi a		> 200 psi a	6BG	
	0 ... 150 psi a		0 psi a		350 psi a		> 350 psi a	6CA	
	0 ... 200 psi a		0 psi a		550 psi a		> 550 psi a	6CB	
	0 ... 300 psi a		0 psi a		800 psi a		> 800 psi a	6CC	
Other version, add Order code and plain text: Measuring range: ... up to ... psi a								9AA	H2Y

Selection and ordering data	Article No.	Order code
SITRANS P 200 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	**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**
0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC		**2 0**
Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC ± 10 %		**3 0**
Explosion protection (only 4 ... 20 mA)		
None		**0**
With explosion protection Ex ia IIC T4		**1**
Electrical connection		
Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling)		**1**
Device plug M12 per IEC 61076-2-101		**2**
Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i")		**0 3**
Quickon 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**
Fixed mounted cable, length 5 m		**0 7**
Special version		**9** **N1Y**
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**
G1/4" to DIN 3852 Form E		**Q**
G1/2" to DIN 3852 Form E		**R**
Special version		**Z** **P1Y**
Sealing material between sensor and enclosure		
Viton (FPM, standard)		**A**
Neoprene (CR)		**B**
Perbunan (NBR)		**C**
EPDM		**D**
Special version		**Z** **Q1Y**
Version		
Standard version		**1**
Further designs		
Supplement the Article No. with "**-Z**" and add Order code.		
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**	
Oxygen version, free of oil and degreased, max. operating pressure 60 bar, max. temperature of medium +85 °C (only in conjunction with the sealing material Viton between sensor and enclosure and not with explosion protection version)	**E10**	

Dimensional drawings

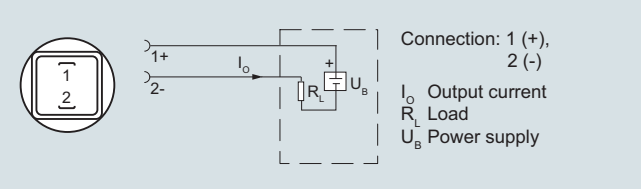


SITRANS P200, electrical connections, dimensions in mm (inch)

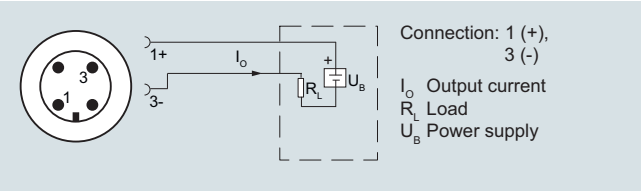


SITRANS P200, process connections, dimensions in mm (inch)

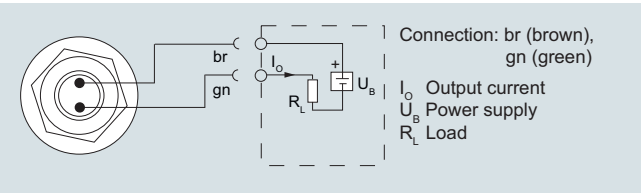
Schematics



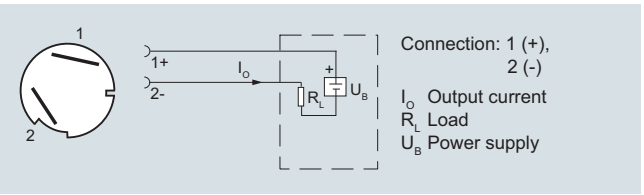
Connection with current output and connector per EN 175301



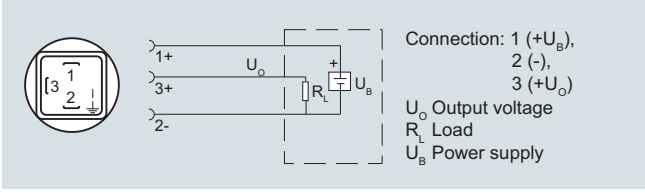
Connection with current output and device plug M12x1



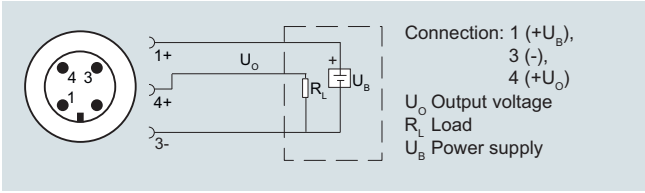
Connection with current output and cable



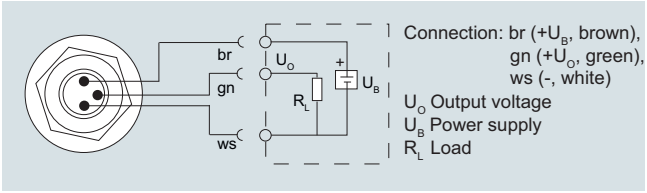
Connection with current output and Quickon cable quick screw connection



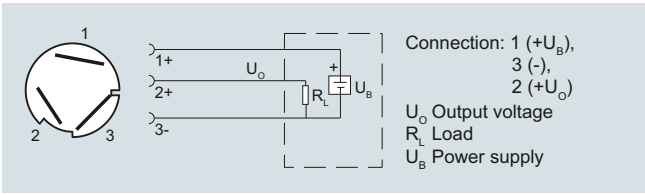
Connection with voltage output, ratiometric output and plug according to EN 175301



Connection with voltage output, ratiometric output and device plug M12x1



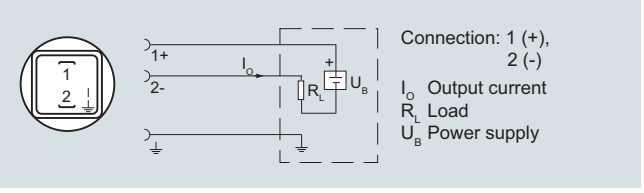
Connection with voltage output, ratiometric output and cable



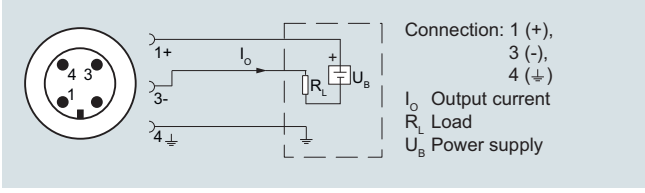
Connection with voltage output, ratiometric output and Quickon fast cable termination

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 device plug 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 device plug M12 (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

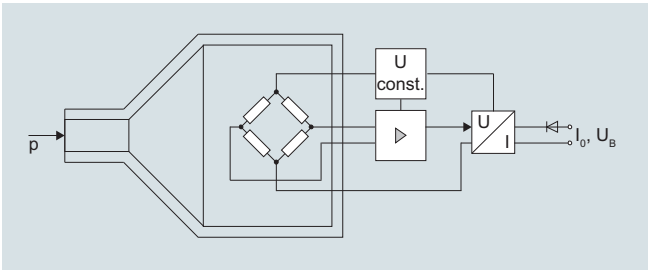
Device structure with explosion protection

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 device 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
Ratiometric output	0 ... 90 %
• Load	≥ 10 kΩ
• Auxiliary power U_B	5 V DC ± 10 %
• 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 measuring span • Maximum: 0.5 % of measuring span
Step response time T_{99}	< 5 ms
Long-term stability	
• Lower range value and measuring span	0.25 % of measuring span/year
Influence of ambient temperature	
• Lower range value and measuring span	• 0.25 %/10 K of measuring span • 0.5 %/10K of measuring span for a measuring range 100 … 400 mbar
• Influence of power supply	0.005 %/V
Operating conditions	
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 ... +125 °C (-40 ... +257 °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 device plug M12 • IP 67 with cable • IP 67 with cable quick screw connection
Electromagnetic compatibility	• acc. IEC 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 dimension drawings
Electrical connections	• Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or ½-14 NPT or Pg 11 • Device plug M12 • 2 or 3-wire (0.5 mm^2) cable (Ø ± 5.4 mm) • Quickon 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 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; meets requirements as per article 4, paragraph 3 (good engineering practice)
Lloyd's Register of Shipping (LR)[1]	12/20010
Germanischer Lloyd (GL)[1]	GL19740 11 HH00
American Bureau of Shipping (ABS)[1]	ABS_11_HG 789392_PDA
Bureau Veritas (BV)[1]	BV 271007A0 BV
Det Norske Veritas (DNV)[1]	A 12553
Drinking water approval (ACS)[1]	ACS 15 ACC NY 360
EAC[1]	№ ТС RU C-DE.ГБ05.В.00732 ОС НАНИО «ЦСВЭ»
Underwriters Laboratories (UL)[1]	
• for USA and Canada	UL 20110217 - E34453
• worldwide	IEC UL DK 21845
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

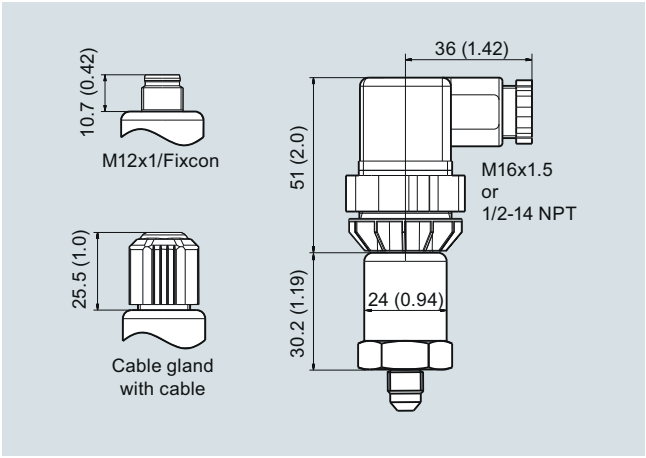
[1] For variants with output signal 0 ... 5 V and ratiometric output available soon.

1

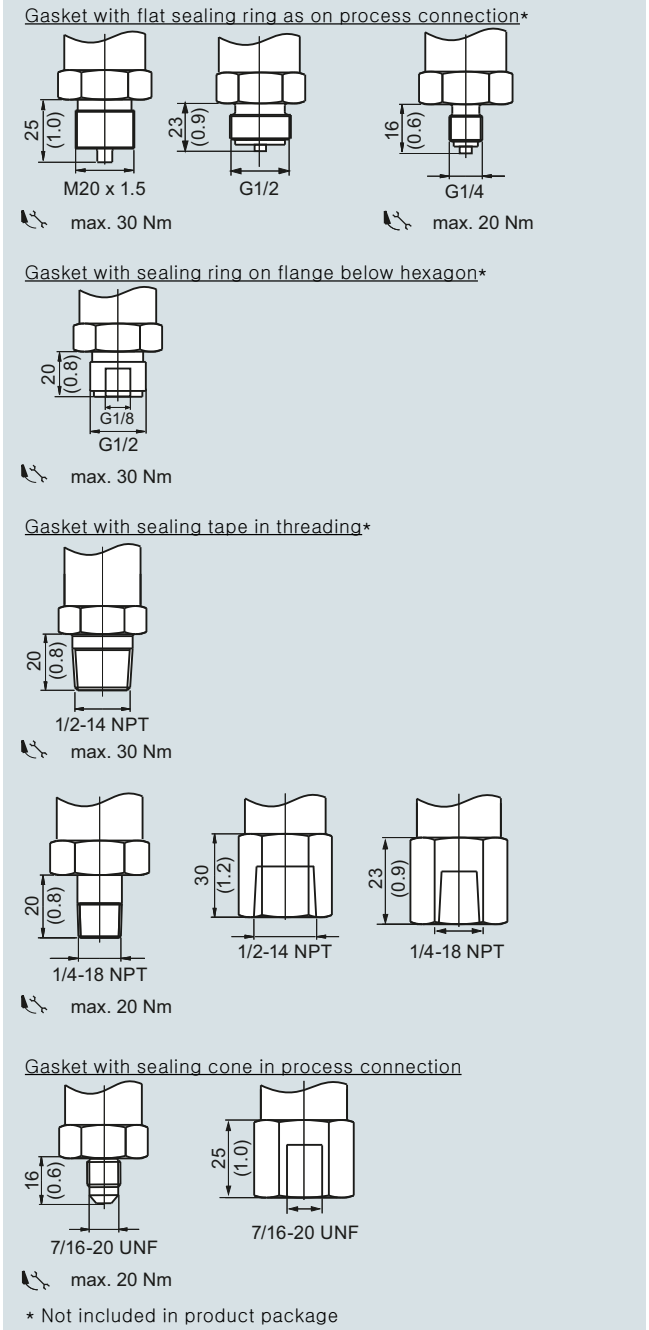
SITRANS P210 for gauge pressure

Selection and ordering data							Article No.	Order code
SITRANS P 210 pressure transmitters for gauge pressure for low pressure applications							↗ 7MF1566 -	
Accuracy typ. 0.25 %								
Wetted parts materials: Stainless steel + sealing material								
Non-wetted parts materials: stainless steel								
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.								
Measuring range		**Overload limit**				**Burst pressure**		
		min.		**max.**				
For gauge pressure								
0...100 mbar	(1.45 psi)	-400 mbar	(-5.8 psi)	400 mbar	(5.8 psi)	1 bar (14.5 psi)	3 A A	
0...160 mbar	(2.32 psi)	-400 mbar	(-5.8 psi)	400 mbar	(5.8 psi)	1 bar (14.5 psi)	3 A B	
0...250 mbar	(3.63 psi)	-800 mbar	(-11.6 psi)	1000 mbar	(14.5 psi)	2 bar (29.0 psi)	3 A C	
0...400 mbar	(5.8 psi)	-800 mbar	(-11.6 psi)	1000 mbar	(14.5 psi)	2 bar (29.0 psi)	3 A D	
0...600 mbar	(8.7 psi)	-1000 mbar	(-14.5 psi)	2000 mbar	(29.0 psi)	3 bar (43.5 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	
0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC							2 0	
Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC ± 10 %							3 0	
Explosion protection (only 4 ... 20 mA)								
None							0	
With explosion protection Ex ia IIC T4							1	
Electrical connection								
Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling)							1	
Device plug M12 per IEC 61076-2-101							2	
Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i")							0 3	
Quickon 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	
Fixed mounted cable, length 5 m							0 7	
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	
G1/4" to DIN 3852 Form E							Q	
G1/2" to DIN 3852 Form E							R	
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 Article No. with "**-Z**" and add Order code.								
Quality test certificate, 5-point factory calibration (IEC 60770-2)							C11	

Dimensional drawings

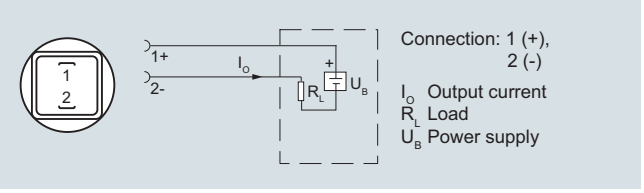


SITRANS P210, electrical connections, dimensions in mm (inch)

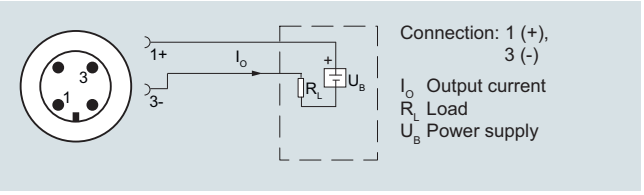


SITRANS P210, process connections, dimensions in mm (inch)

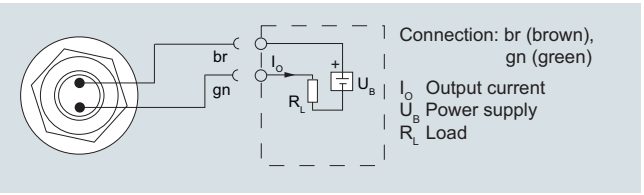
Schematics



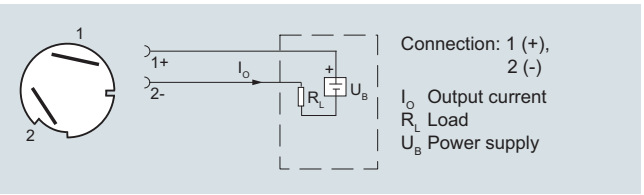
Connection with current output and connector per EN 175301



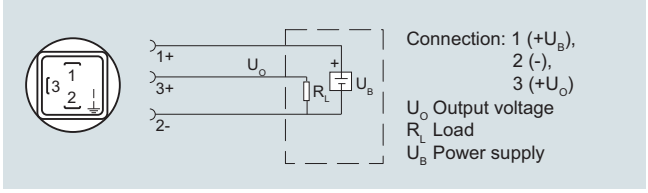
Connection with current output and device plug M12x1



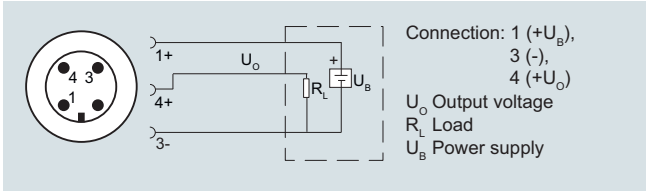
Connection with current output and cable



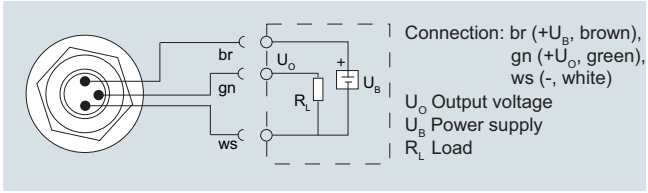
Connection with current output and Quickon cable quick screw connection



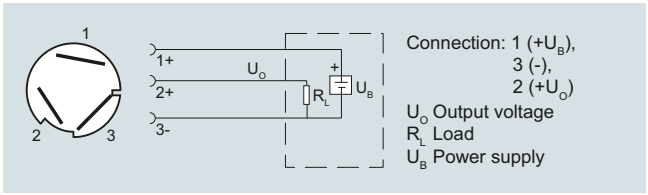
Connection with voltage output, ratiometric output and plug according to EN 175301



Connection with voltage output, ratiometric output and device plug M12x1



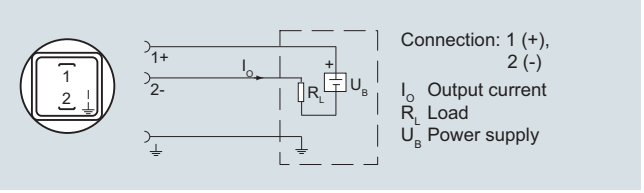
Connection with voltage output, ratiometric output and cable



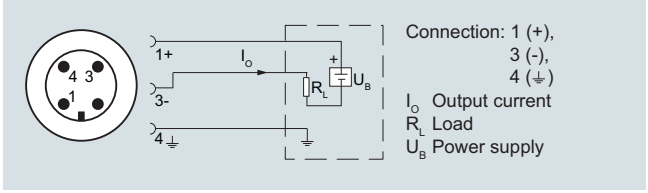
Connection with voltage output, ratiometric output and Quickon fast cable termination

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 device plug 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 1000 bar (36.3 to 14500 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 device plug M12 (IP67), a cable (IP67) or a Quickon cable quick screw connection (IP67) connected electrically. The output signal is between 4 and 20 mA or 0 and 10 V.

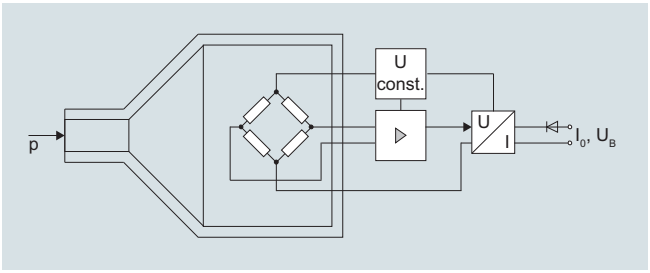
Device structure with explosion protection

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 device 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.

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 … 1000 bar (36 … 14500 psi)
- US measuring range	30… 14500 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
Ratiometric output	0 ... 90 %
• Load	≥ 10 kΩ
• Auxiliary power U_B	5 V DC ± 10 %
• 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 measuring span • Maximum: 0.5 % of measuring span
Step response time T_{99}	< 5 ms
Long-term stability	
• Lower range value and measuring span	0.25 % of measuring span/year
Influence of ambient temperature	
• Lower range value and measuring span	0.25 %/10 K of measuring span
• Influence of power supply	0.005 %/V
Operating conditions	
• Process temperature	-40 ... +120 °C (-40 ... +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 device plug M12 • IP 67 with cable • IP 67 with cable quick screw connection
Electromagnetic compatibility	• acc. IEC 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 dimension drawings
Electrical connections	• Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or ½-14 NPT or Pg 11 • Device plug M12 • 2 or 3-wire (0.5 mm^2) cable (Ø ± 5.4 mm) • Quickon 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 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Lloyd's Register of Shipping (LR)[1]	12/20010
Germanischer Lloyd (GL)[1]	GL19740 11 HH00
American Bureau of Shipping (ABS)[1]	ABS_11_HG 789392_PDA
Bureau Veritas (BV)[1]	BV 271007A0 BV
Det Norske Veritas (DNV)[1]	A 12553
Drinking water approval (ACS)[1]	ACS 15 ACC NY 360
EAC[1]	№ ТС RU C-DE.ГБ05.В.00732 ОС НАНИО «ЦСВЭ»
CRN[2]	0F18659.5C
Underwriters Laboratories (UL)[1]	
• for USA and Canada	UL 20110217 - E34453
• worldwide	IEC UL DK 21845
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	$L_i = 0\ nH$; $C_i = 0\ nF$
CSA[2]	70006348 Class I, Division I, Groups A, B, C and D; Class II, Division 1, Groups E, F and G, Class III Class I, Division 2, Groups A, B, C and D; Class II, Division 2, Groups F and G, Class III A/Ex ia IIC T4 Ga/Gb A/Ex ia IIIC T125°C Da/Db

[1] For variants with output signal 0 ... 5 V and ratiometric output available soon.
[2] See ordering data for available versions.

Selection and ordering data

SITRANS P 220 pressure transmitters for gauge pressure, high-pressure and refrigeration applications, fully-welded version — Article No. 7MF1567-

Accuracy typ. 0.25 %

Wetted parts materials: stainless steel

Non-wetted parts materials: stainless steel

↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Measuring range	Overload limit: Minimum	Overload limit: Max.	Burst pressure	Order code
For gauge pressure				
0 ... 2.5 bar (0 ... 36.3 psi)	-1 bar (-14.5 psi)	6.25 bar (90.7 psi)	25 bar (363 psi)	3BD
0 ... 4 bar (0 ... 58 psi)	-1 bar (-14.5 psi)	10 bar (145 psi)	40 bar (870 psi)	3BE
0 ... 6 bar (0 ... 87 psi)	-1 bar (-14.5 psi)	15 bar (217 psi)	60 bar (522 psi)	3BG
0 ... 10 bar (0 ... 145 psi)	-1 bar (-14.5 psi)	25 bar (362 psi)	60 bar (870 psi)	3CA
0 ... 16 bar (0 ... 232 psi)	-1 bar (-14.5 psi)	40 bar (580 psi)	96 bar (1392 psi)	3CB
0 ... 25 bar (0 ... 363 psi)	-1 bar (-14.5 psi)	62.5 bar (906 psi)	150 bar (2176 psi)	3CD
0 ... 40 bar (0 ... 580 psi)	-1 bar (-14.5 psi)	100 bar (1450 psi)	240 bar (3481 psi)	3CE
0 ... 60 bar (0 ... 870 psi)	-1 bar (-14.5 psi)	150 bar (2175 psi)	360 bar (5221 psi)	3CG
0 ... 100 bar (0 ... 1450 psi)	-1 bar (-14.5 psi)	250 bar (3625 psi)	600 bar (8702 psi)	3DA
0 ... 160 bar (0 ... 2320 psi)	-1 bar (-14.5 psi)	400 bar (5801 psi)	960 bar (13924 psi)	3DB
0 ... 250 bar (0 ... 3625 psi)	-1 bar (-14.5 psi)	625 bar (9064 psi)	1500 bar (21756 psi)	3DD
0 ... 400 bar (0 ... 5801 psi)	-1 bar (-14.5 psi)	1000 bar (14503 psi)	2400 bar (34809 psi)	3DE
0 ... 600 bar (0 ... 8702 psi)	-1 bar (-14.5 psi)	1500 bar (21755 psi)	3600 bar (52200 psi)	3DG
0 ... 1000 bar (0 ... 14500 psi)	-1 bar (-14.5 psi)	1500 bar (21755 psi)	5000 bar (72520 psi)	3EA
Other version, add Order code and plain text: Measuring range: ... up to... bar (psi)				9AA H1Y
Measuring ranges for gauge pressure				
0 ... 30 psi	-14.5 psi	75 psi	360 psi *	4BE
0 ... 60 psi	-14.5 psi	150 psi	580 psi *	4BF
0 ... 100 psi	-14.5 psi	250 psi	580 psi *	4BG
0 ... 150 psi	-14.5 psi	375 psi	870 psi *	4CA
0 ... 200 psi	-14.5 psi	500 psi	1390 psi *	4CB
0 ... 300 psi	-14.5 psi	750 psi	2170 psi *	4CD
0 ... 500 psi	-14.5 psi	1250 psi	3481 psi *	4CE
0 ... 750 psi	-14.5 psi	1875 psi	5220 psi *	4CF
0 ... 1000 psi	-14.5 psi	2500 psi	5220 psi *	4CG
0 ... 1500 psi	-14.5 psi	3750 psi	8700 psi *	4DA
0 ... 2000 psi	-14.5 psi	5000 psi	13920 psi *	4DB
0 ... 3000 psi	-14.5 psi	7500 psi	21750 psi *	4DD
0 ... 5000 psi	-14.5 psi	12500 psi	34800 psi *	4DE
0 ... 6000 psi	-14.5 psi	15000 psi	34800 psi *	4DF
0 ... 8700 psi	-14.5 psi	21755 psi	52200 psi *	4DG
0 ... 14500 psi	-14.5 psi	21755 psi	72520 psi	4EA
Other version, add Order code and plain text: Measuring range: ... up to ... psi				9AA H1Y

Output signal

	Order code
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	10
0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC	20
Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC ± 10 %	30

Explosion protection (only 4 ... 20 mA)

	Order code
None	0
With explosion protection Ex ia IIC T4	1

Electrical connection

	Order code
Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling) *	1
Device plug M12 per IEC 61076-2-101	2
Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i")	03
Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i")	04
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
Fixed mounted cable, length 5 m	07
Special version	9 N1Y

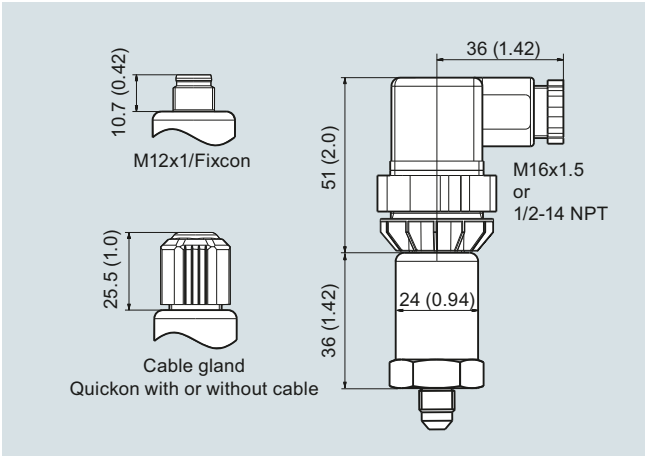
* Order code E21 required for complete configuration with CRN and $_{c}CSA_{us}$ Ex approval.

SITRANS P220 for gauge pressure

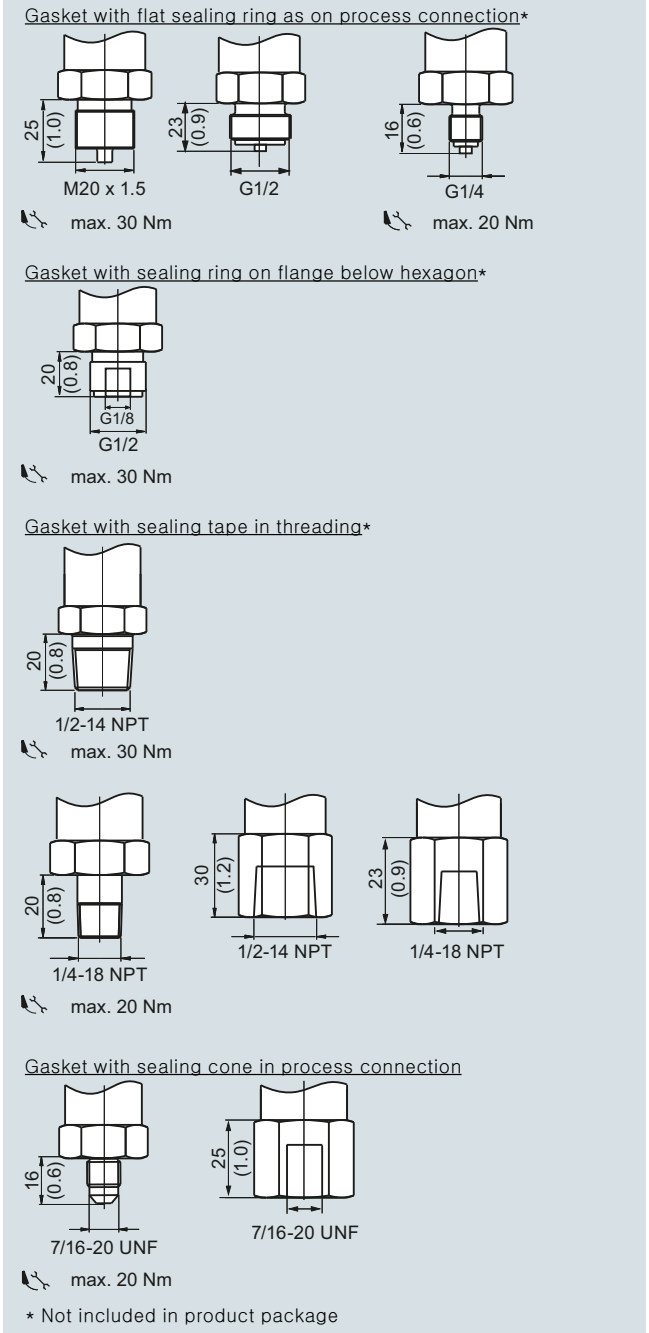
Selection and ordering data		Article No.	Order code
SITRANS P 220 pressure transmitters for gauge pressure, high-pressure and refrigeration applications, fully-welded version Accuracy typ. 0.25 % Wetted parts materials: stainless steel Non-wetted parts materials: stainless steel		**7MF1567 -** ■■■■■ **-** ■■	**A** ■ ■■■
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 (Only for measuring ranges ≤ 60 bar (870 psi))			**H**
7/16"-20 UNF female			**J**
M20x1.5 male			**P**
G1/4" to DIN 3852 Form E			**Q**
G1/2" to DIN 3852 Form E			**R**
Special version			**Z** **P1Y**
Version			
Standard version	✱		**1**
Further designs			
Supplement the Article No. with "**-Z**" and add Order code.			
Quality test certificate, 5-point factory calibration (IEC 60770-2) (not possible for measuring ranges > 0 ... 600 bar/0 ... 8 702 psi)		**C11**	
Oxygen version, free of oil and degreased (not in conjunction with explosion protection version)		**E10**	
With CRN and $_cCSA_{us}$ Ex approval (only for measuring ranges 0 ... 30 psi bis 0 ... 8 700 psi)		**E21**	

✱ Order code E21 required for complete configuration with CRN and $_cCSA_{us}$ Ex approval..

Dimensional drawings

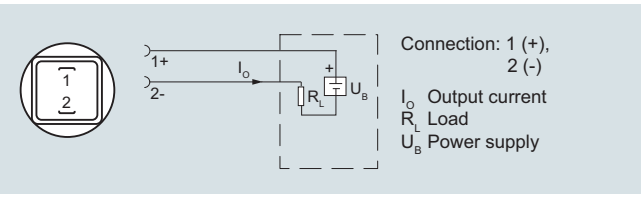


SITRANS P220, electrical connections, dimensions in mm (inch)

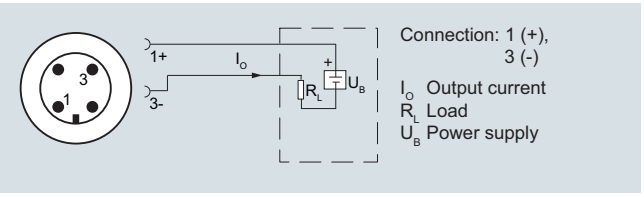


SITRANS P220, process connections, dimensions in mm (inch)

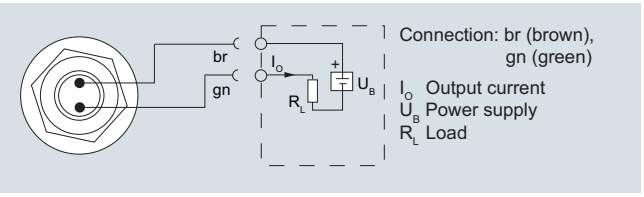
Schematics



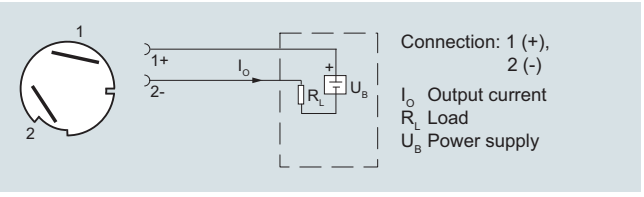
Connection with current output and connector per EN 175301



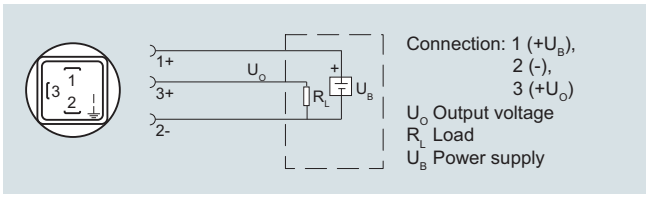
Connection with current output and device plug M12x1



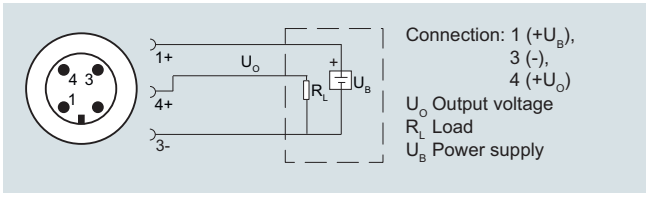
Connection with current output and cable



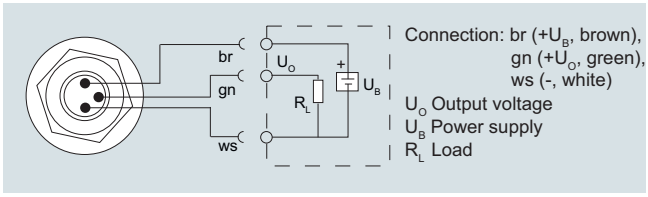
Connection with current output and cable quick screw connection Quick-on



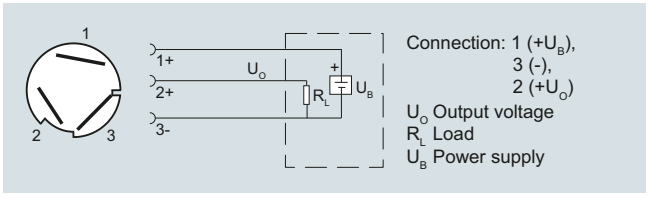
Connection with voltage output, ratiometric output and plug according to EN 175301



Connection with voltage output, ratiometric output and device plug M12x1



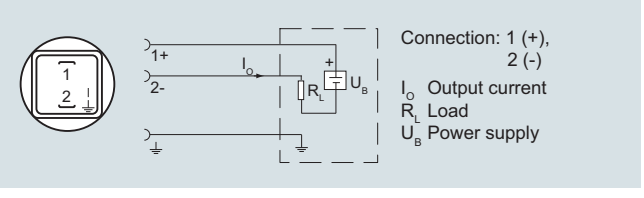
Connection with voltage output, ratiometric output and cable



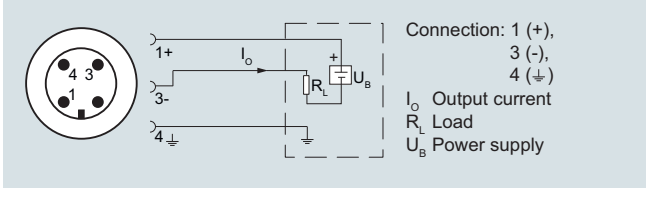
Connection with voltage output, ratiometric output and Quickon fast cable termination

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 device plug M12x1 (Ex)

Overview

The pressure transmitter SITRANS LH100 is a submersible sensor for hydrostatic level measurement.

The pressure transmitter measures the liquid levels in tanks, containers, channels and dams. The SITRANS LH100 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 LH100 pressure transmitters are used in the following branches, for example:

- Shipbuilding
- Water/waste water supply
- For use in unpressurized/open vessels and wells

Design

The pressure transmitter has a built-in ceramic sensor which is equipped with a Wheatstone resistance bridge.

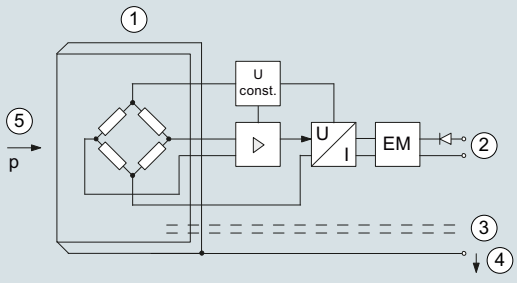
These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel enclosure. In addition, the connecting cable contains a vent pipe which is equipped with a humidity filter to prevent the build-up of condensation.

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

The sensor, the electronics and the connecting cable are housed in an enclosure with small dimensions.

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

Function



1 Sensor
2 Connection for auxiliary power supply
3 Vent pipe with humidity filter
4 Protective conductor connection/ Equipotential bonding
5 Diaphragm

SITRANS LH100 pressure transmitter, mode of operation and connection diagram

On one side of the sensor (1), the diaphragm (5) 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 (3) in the connecting cable. The vent pipe is equipped with a humidity filter which prevents the build-up of condenstation in the vent pipe.

The hydrostatic pressure of the liquid column acts on the diaphragm of the sensor and transmits the pressure to the Wheatstone resistance bridge in the sensor.

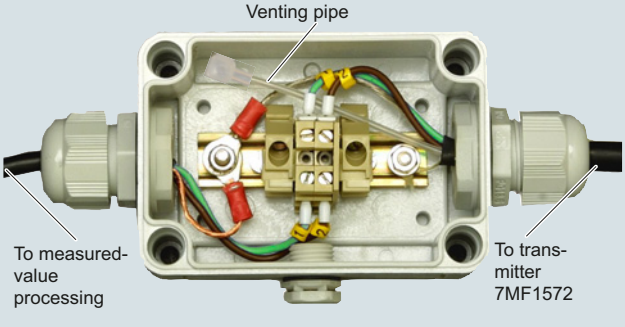
The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

The protective conductor connection/equipotential bonding (4) is connected to the enclosure.

Integration

It is generally recommended that the connecting cable of the SITRANS LH100 transmitter is connected to the cable box, which can be ordered separately, and secured with the anchoring clamp, also available separately. 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.



Junction box 7MF1572-8AA, open, schematic diagram

SITRANS LH100 Transmitter for hydrostatic level

Measuring point setup, generally with junction box 7MF1572-8AA and 7MF1572-8AB cable hanger

Technical specifications

Pressure transmitter SITRANS LH100 (submersible sensor)	
Mode of operation	
Measuring principle	piezo-resistive
Input	
Measured variable	Hydrostatic level
Measuring range	Max. permissible operating pressure
• 0 ... 3 mH_2O (0 ... 9 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 4 mH_2O (0 ... 12 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 5 mH_2O (0 ... 15 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 6 mH_2O (0 ... 18 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 10 mH_2O (0 ... 30 ftH_2O)	• 3.0 bar (43.5 psi) (corresponds to 30 mH2O (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))
• 0 ... 0.3 bar	• 1.5 bar
• 0 ... 0.4 bar	• 1.5 bar
• 0 ... 0.5 bar	• 1.5 bar
• 0 ... 0.6 bar	• 1.5 bar
• 0 ... 1 bar	• 3.0 bar
• 0 ... 2 bar	• 5.0 bar
Output	
Output signal	4 ... 20 mA
Measuring accuracy	According to IEC 60770-1
Error in measurement at limit setting including hysteresis and reproducibility	0.3% of upper range value (typical)
Measuring range	
• 0 ... 3 mH_2O (0 ... 9 ftH_2O bzw. 0 ... 0.3 bar)	0.5 % of upper range value (typical) 1.0% of upper range value (maximum)
• For all other measuring ranges	0.3 % of upper range value (typical) 0.6% of upper range value (maximum)
Influence of ambient temperature	
Measuring range	Zero and span
• 3 mH_2O (9 ftH_2O or 0.3 bar)	0.5 %/10 K of upper range value
• 4 ... 6 mH_2O (12 ... 18 ftH_2O or 0.4…0.6 bar)	0.45 %/10 K of upper range value
• > 6 mH_2O (> 18 ftH_2O or > 0.6 bar)	0.3 %/10 K of upper range value
Long-term stability	
Measuring range	Zero and span
• 3 mH_2O (9 ftH_2O or 0.3 bar)	0.4 % of upper range value/year
• 4 ... 6 mH_2O (12 ... 18 ftH_2O or 0.4…0.6 bar)	0.25% of upper range value/year
• > 6 mH_2O (> 18 ftH_2O or > 0.6 bar)	0.2 % of upper range value/year
Operating conditions	
Ambient conditions	
• Process temperature	-10 ... +80 °C (14 ... 176 °F)
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
Degree of protection according to IEC 60529	IP68

Design	
Weight	
• Pressure transmitter	≈ 0.2 kg (≈ 0.44 lb)
• Cable; maximum cable length 100 m (330 ft)	0.025 kg/m (≈ 0.015 lb/ft)
Electrical connection	Cable with 3 conductors, vent pipe and integrated humidity filter
Material	
• Seal diaphragm	Al_2O_3 ceramic, 96%
• Enclosure	Stainless steel, mat. no. 1.4404/316L
• Gasket	FPM (standard)
	EPDM (optional)
• Connecting cable	PE-HD (standard)
	PE-LD (in the case of versions with EPDM seal, suitable for drinking water)
Auxiliary power	
Terminal voltage on pressure transmitter U_B	10 ... 33 V DC
	10 ... 30 V DC for transmitter with intrinsic safety explosion protection
Certificates and approvals	
Drinking water approval (ACS)	15 ACC NY 360
EAC	№ ТС RU C-DE.ГБ05.В.00732 ОС НАНИО «ЦСВЭ»
Underwriters Laboratories (UL)	2014-11-17 - E344532
The transmitter is not subject to the pressure equipment directive (PED 2014/68/EU)	
Explosion protection	
• Intrinsic safety "i"	IECEx SEV 14.0003 SEV 14 ATEX 0109
- Marking	II 1 G Ex ia IIC T4 Ga
• EAC Ex	TC RU C-DE.AA87.B.00324

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 Pg 9
Enclosure material	polycarbonate
Vent valve for atmospheric pressure	
Operating conditions	
Degree of protection according to IEC 60529	IP65
Cable hanger	
Application	for mounting the transmitter
Design	
Weight	0.16 kg (0.35 lb)
Material	Galvanized steel, polyamide

1

SITRANS LH100 Transmitter for hydrostatic level

Selection and ordering data		Article No.	Order code
Pressure transmitter SITRANS LH100 (submersible sensor) ↗		**7MF1572-**	**A**
For measurement of the hydrostatic level through submersion, two-wire system, 4…20 mA, enclosure material mat. no. 1.4404 (316L), measuring cell Al_2O_3 ceramic, with permanently mounted PE cable			
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring range	**Cable length**		
0 ... 3 mH_2O[1]	10 m		**1 C**
0 ... 4 mH_2O	10 m		**1 D**
0 ... 5 mH_2O	10 m		**1 E**
0 ... 6 mH_2O	10 m		**1 F**
0 ... 10 mH_2O	20 m		**1 H**
0 ... 20 mH_2O	30 m		**1 K**
0 ... 9 ftH_2O[1]	33 ft		**2 C**
0 ... 12 ftH_2O	33 ft		**2 D**
0 ... 15 ftH_2O	33 ft		**2 E**
0 ... 18 ftH_2O	33 ft		**2 F**
0 ... 30 ftH_2O	66 ft		**2 H**
0 ... 60 ftH_2O	98 ft		**2 K**
0 ... 0.3 bar[1]	10 m		**3 C**
0 ... 0.4 bar	10 m		**3 D**
0 ... 0.5 bar	10 m		**3 E**
0 ... 0.6 bar	10 m		**3 F**
0 ... 1 bar	20 m		**3 H**
0 ... 2 bar	30 m		**3 K**
Special versions: Measuring ranges for special versions between 0 ... 3 mH_2O and 0 ... 30 mH_2O or 0 ... 9 ftH_2O and 0 ... 100 ftH_2O or 0 ... 0.3 bar and 0 ... 3 bar possible.			
Special cable lenght/Special measuring range Please add „-Z" to Article No. and specify Order code and plain text. Note: Indication of measuring range Y01 is always necessary.			**9 A** **H . .** **+** **Y 0 1**
For evaluation of the maximum possible cable length following data have to be regarded: Transmitter: C_i = 0 µF, L_i = 0 µH Cable: C_k = 0.19 nF per meter cable L_k = 1.5 µH per meter cable The maximum permitted data of the transmitter's power supply have to be considered!			
3 m (10 ft)			**H 1 A**
5 m (16 ft)			**H 1 B**
7 m (23 ft)			**H 1 C**
10 m (33 ft)			**H 1 D**
15 m (49 ft)			**H 1 E**
20 m (66 ft)			**H 1 F**
25 m (82 ft)			**H 1 G**
30 m (98 ft)			**H 1 H**
40 m (131 ft)			**H 1 J**
50 m (164 ft)			**H 1 K**
60 m (198 ft)[1]			**H 1 L**
70 m (231 ft)[1]			**H 1 M**
80 m (264 ft)[1]			**H 1 N**
90 m (297 ft)[1]			**H 1 P**
100 m (330 ft)[1]			**H 1 Q**

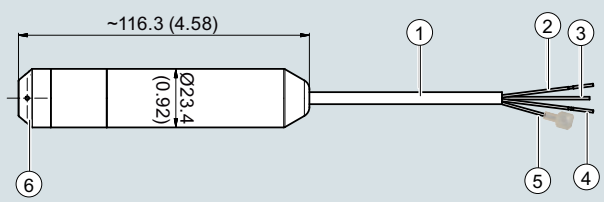
Selection and ordering data	Article No.	Order code
Pressure transmitter SITRANS LH100 (submersible sensor)	**7MF1572-**	**A**
For measurement of the hydrostatic level through submersion, two-wire system, 4…20 mA, enclosure material mat. no. 1.4404 (316L), measuring cell Al_2O_3 ceramic, with permanently mounted PE cable		
Sealing material between sensor and enclosure		
• FPM (Standard)		**1**
• EPDM (for drinking water applications)		**2**
Explosion protection		
• without		**0**
• With ATEX II1 G Ex ia IIC T4 Ga and IECEx Ex ia IIC T4 Ga		**1**

Additional versions	Order code
Quality test certificate, 5-point factory calibration (IEC 60770-2), add "**-Z**" to article no. and add order code.	**C11**
Indication of measuring range (only at special cable lengths) in "... to ... mH_2O" or "... to ... ftH_2O" or "... to ... bar"	**Y01**

Accessories/spare parts	Article No.
Junction box for connecting the transmitter cable	**7MF1572-8AA**
Cable hanger for securing the pressure transmitter	**7MF1572-8AB**
Protective caps as spare parts (10-pack)	**7MF1572-8AD**
Humidity filters as spare parts (10-pack)	**7MF1572-8AE**

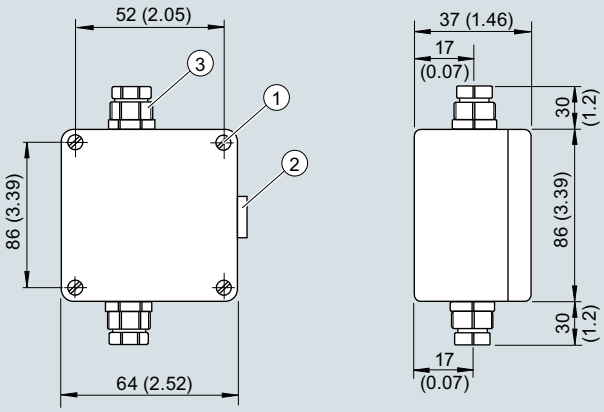
[1] Approvals pending.

Dimensional drawings



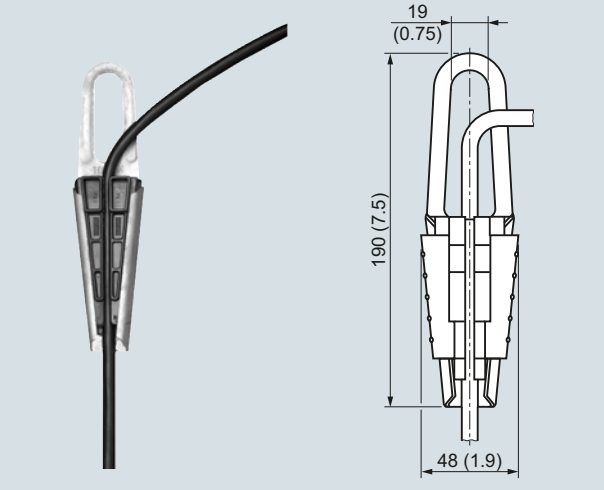
1. Cable, sheat Ø 4.8 (0.19) (black, PE)
2. - (green)
3. + (brown)
4. Protective conductor connection/Equipotential bonding (white)
5. Vent pipe with humidity filter Ø 1 (0.04) (inner diameter)
6. Protective cap with 4 x Ø 2.5 (0.10) holes (black, PPE)

SITRANS LH100 pressure transmitter, dimensions in mm (inch)



1. Fastening hole
2. Vent valve
3. Cable gland Pg 9, cable diameter 4 ... 8 mm (0.16 ... 0.31)

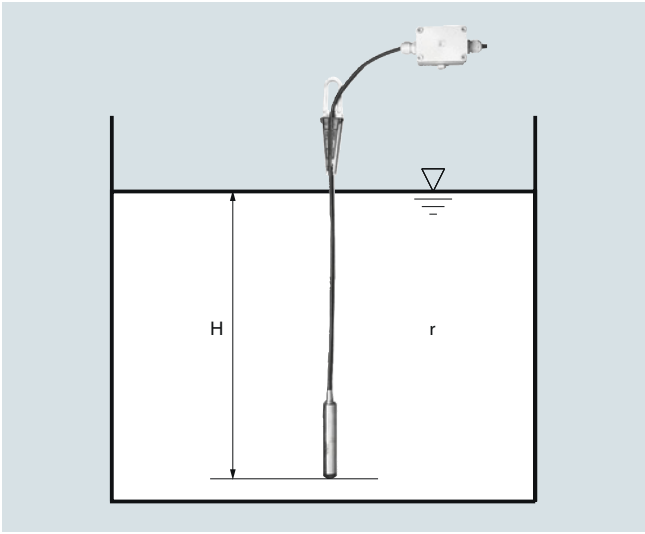
Junction box, dimensions in mm (inch)



Cable hanger, dimensions in mm (inch)

More information

Establishing the measuring range for water as process medium



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: Water, ρ = 1 000 kg/m^3
Acceleration due to gravity: 9.81 m/s^2
Lower range value: 0 m
Maximum level: 6.0 m
Cable length: 10 m

Calculation:

p = 1 000 kg/m^3 x 9.81 m/s^2 x 6.0 m
p = 58 860 N/m^2
p = 589 mbar

Transmitter to be ordered:
7MF1572-1FA10
Plus, if required, junction box 7MF1572-8AA and cable hanger 7MF1572-8AB

SITRANS LH300 Transmitter for hydrostatic level

Overview

The pressure transmitter SITRANS LH300 is a submersible sensor for hydrostatic level measurement with cap made of PPE (left), stainless steel (mid) and ETFE (right).

The pressure transmitter measures the liquid levels in tanks, containers, channels and dams. The SITRANS LH300 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 (0.15 % typical)
- Degree of protection IP68

Application

SITRANS LH300 pressure transmitters are used in the following branches, for example:

- Shipbuilding
- Water/waste water supply
- Drinking water facilities
- For use in unpressurized/open vessels and wells
- Desalination plants

Design

The pressure transmitter has a built-in ceramic sensor which is equipped with a Wheatstone resistance bridge.

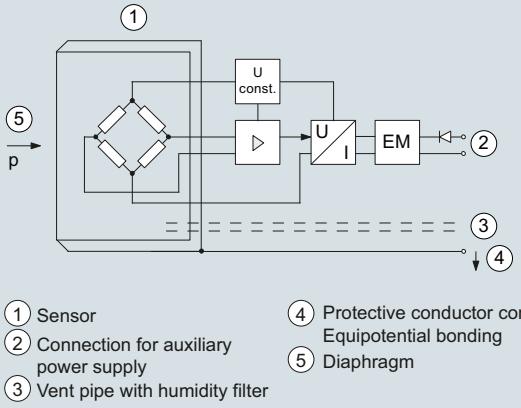
These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel enclosure. In addition, the connecting cable contains a vent pipe which is equipped with a humidity filter to prevent the build-up of condensation.

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

The sensor, the electronics and the connecting cable are housed in an enclosure with small dimensions.

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

Function



SITRANS LH300 pressure transmitter, mode of operation and connection diagram

On one side of the sensor (1), the diaphragm (5) 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 (3) in the connecting cable. The vent pipe is equipped with a humidity filter which prevents the build-up of condensation in the vent pipe.

The hydrostatic pressure of the liquid column acts on the diaphragm of the sensor and transmits the pressure to the Wheatstone resistance bridge in the sensor.

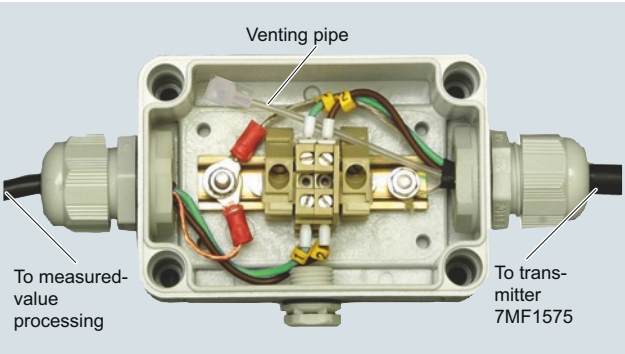
The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

The protective conductor connection/equipotential bonding (4) is connected to the enclosure.

Integration

It is generally recommended that the connecting cable of the SITRANS LH300 transmitter is connected to the cable box, which can be ordered separately, and secured with an anchoring clamp, also available separately. The cable plug is to be installed near the measuring point, but outside the medium.

Likewise, in the case of media other than water the compatibility with the specified materials of the transmitter, cable and seal must be checked.



Junction box 7MF1575-8AA, open, schematic diagram

Measuring point setup, generally with junction box 7MF1575-8AA and 7MF1575-8AB cable hanger

Technical specifications

Pressure transmitter SITRANS LH300 (submersible sensor)	
Mode of operation	
Measuring principle	Piezo-resistive
Input	
Measured variable	Hydrostatic level
Measuring range	Max. permissible operating pressure
• 0 ... 1 mH_2O (0 ... 3 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 2 mH_2O (0 ... 6 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 3 mH_2O (0 ... 9 ftH_2O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH_2O (45 ftH_2O))
• 0 ... 4 mH_2O (0 ... 12 ftH_2O)	• 2 bar (29 psi) (corresponds to 20 mH_2O (60 ftH_2O))
• 0 ... 5 mH_2O (0 ... 15 ftH_2O)	• 2 bar (29 psi) (corresponds to 20 mH_2O (60 ftH_2O))
• 0 ... 6 mH_2O (0 ... 18 ftH_2O)	• 2 bar (29 psi) (corresponds to 20 mH_2O (60 ftH_2O))
• 0 ... 10 mH_2O (0 ... 30 ftH_2O)	• 5 bar (72.5 psi) (corresponds to 50 mH2O (150 ftH_2O))
• 0 ... 20 mH_2O (0 ... 60 ftH_2O)	• 10 bar (145 psi) (corresponds to 100 mH_2O (300 ftH_2O))
• 0 ... 40 mH_2O (0 ... 120 ftH_2O)	• 20 bar (290 psi) (corresponds to 200 mH_2O (600 ftH_2O))
Special measuring ranges	
• Up to 100 mH_2O (300 ftH_2O)	• 20 bar (290 psi) (corresponds to 200 mH_2O (600 ftH_2O))
• Up to 160 mH_2O (480 ftH_2O)	• 24 bar (348 psi) (corresponds to 240 mH_2O (720 ftH_2O))
Measuring range	
• 0 ... 0.1 bar	• 1.5 bar
• 0 ... 0.2 bar	• 1.5 bar
• 0 ... 0.3 bar	• 1.5 bar
• 0 ... 0.4 bar	• 2 bar
• 0 ... 0.5 bar	• 2 bar
• 0 ... 0.6 bar	• 2 bar
• 0 ... 1 bar	• 5 bar
• 0 ... 2 bar	• 10 bar
• 0 ... 4 bar	• 20 bar
Special measuring range	
• Up to 10 bar	• 20 bar
• Up to 16 bar	• 24 bar
Output	
Output signal	4 ... 20 mA
Measuring accuracy	According to IEC 60770-1
Error in measurement at limit setting including hysteresis and reproducibility	≤ 0.15 % of upper range value (typical)
	≤ 0.3 % of upper range value (maximum)
Influence of ambient temperature	≤ 0.05 %/10 K of upper range value (zero and span)
Long-term stability	≤ 0.15 % of upper range value/year (zero and span)
Operating conditions	
Ambient conditions	
• Process temperature	-10 ... +80 °C (14 ... 176 °F)
• Storage temperature	-20 ... +80 °C (-4 ... +176 °F)
Degree of protection according to IEC 60529	IP68

SITRANS LH300 Transmitter for hydrostatic level

Design	
Weight	
• Pressure transmitter	≈ 0.4 kg (≈ 0.88 lb)
• Cable	0.08 kg/m (≈ 0.059 lb/ft)
Maximal freely suspended length	300 m (990 ft)
Electrical connection	Cable with 2 conductors, vent pipe and integrated humidity filters
Material	
• Seal diaphragm	Al_2O_3 ceramic, 99.6 %
• Enclosure	Stainless steel, mat. no. 1.4404/316L and 1.4539/904L (sea water applications) respectively
• Gasket	FPM (standard)
	EPDM (optional)
• Connecting cable	PE (standard/drinking water applications)
	FEP (for aggressive media)
• Cap	Stainless steel, PPE or ETFE
Auxiliary power	
Terminal voltage on pressure transmitter U_B	10 ... 33 V DC for transmitter without explosion protection
	10 ... 30 V DC for transmitter with intrinsic safety explosion protection
Certificates and approvals	
Drinking water approval (ACS)	17 ACC NY 055
EAC	TC N RU Д-DE.ГА02.B.05092
Underwriters Laboratories (UL)	ML File No. E344532, issued 2017-08-17
Shipbuilding approval (LR)	LR_18/20074
Shipbuilding approval (DNV/GL)	TAA00000CE
Shipbuilding approval (BV)	56926/A0 BV
Shipbuilding approval (ABS)	HG1881314_P
Shipbuilding approval (RINA)	ELE067319XG
Pressure equipment directive	The transmitter is not subject to the pressure equipment directive (PED 2014/68/EU)
Explosion protection	
• ATEX	SEV 16 ATEX 0121
• IEC Ex	IEC Ex SEV 16.0003
• EAC Ex	TC RU C-DE.AA87.B.00324
• Intrinsic safety "i"	
- Marking	II 1 G Ex ia IIC T4 Ga

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 PG 13.5
Enclosure material	Polycarbonate
Vent valve for atmospheric pressure	
Operating conditions	
Degree of protection according to IEC 60529	IP65
Cable hanger	
Application	For mounting the transmitter
Design	
Weight	0.16 kg (0.35 lb)
Material	Galvanized steel, polyamide
Terminal area	For cable with a diameter of 5.5 ... 9.5 mm

Selection and ordering data		Article No.	Order code
Pressure transmitter SITRANS LH300 (submersible sensor) ↗		**7MF1575-**	
For hydrostatic level measurement, submersible transmitter, two-wire connection, 4 … 20 mA, enclosure material see Order option, measuring cell Al_2O_3 ceramics (99.6 % purity), with fixed mounted cable, material of protective cap at PE cable: PPE (colour black) material of protective cap at FEP cable: PPE (colour white)			
Note: junction box and cable hanger have to be ordered separately.			
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring range	**Cable length (PE cable)**		
0 ... 1 mH_2O	5 m	**1A**	
0 ... 2 mH_2O	5 m	**1B**	
0 ... 3 mH_2O	10 m	**1C**	
0 ... 4 mH_2O	10 m	**1D**	
0 ... 5 mH_2O	10 m	**1E**	
0 ... 6 mH_2O	10 m	**1F**	
0 ... 10 mH_2O	20 m	**1H**	
0 ... 20 mH_2O	30 m	**1K**	
0 ... 40 mH_2O	50 m	**1L**	
0 ... 3 ftH_2O	5 m (≈ 15 ft)	**2A**	
0 ... 6 ftH_2O	5 m (≈ 15 ft)	**2B**	
0 ... 9 ftH_2O	10 m (≈ 30 ft)	**2C**	
0 ... 12 ftH_2O	10 m (≈ 30 ft)	**2D**	
0 ... 15 ftH_2O	10 m (≈ 30 ft)	**2E**	
0 ... 18 ftH_2O	10 m (≈ 30 ft)	**2F**	
0 ... 30 ftH_2O	20 m (≈ 60 ft)	**2H**	
0 ... 60 ftH_2O	30 m (≈ 90 ft)	**2K**	
0 ... 120 ftH_2O	50 m (≈ 150 ft)	**2L**	
0 ... 0.1 bar	5 m	**3A**	
0 ... 0.2 bar	5 m	**3B**	
0 ... 0.3 bar	10 m	**3C**	
0 ... 0.4 bar	10 m	**3D**	
0 ... 0.5 bar	10 m	**3E**	
0 ... 0.6 bar	10 m	**3F**	
0 ... 1 bar	20 m	**3H**	
0 ... 2 bar	30 m	**3K**	
0 ... 4 bar	50 m	**3L**	
Special versions:			
Measuring ranges for special versions between			
0 ... 1 mH_2O and 0 ... 160 mH_2O or			
0 ... 3 ftH_2O and 0 ... 530 ftH_2O or			
0 ... 0.1 bar and 0 ... 16 bar possible.			

Selection and ordering data	Article No.	Order code
Pressure transmitter SITRANS LH300 (submersible sensor)	**7MF1575-**	
PE cable for general purpose and drinking water applications		
Special cable length Please add „-Z" to Article No. and specify Order code and plain text: Y01: Cable length	**9X**	**H..** **+** **Y01**
3 m (≈ 10 ft)		**H1A**
5 m (≈ 16 ft)		**H1B**
7 m (≈ 23 ft)		**H1C**
10 m (≈ 33 ft)		**H1D**
15 m (≈ 50ft)		**H1E**
20 m (≈ 65 ft)		**H1F**
25 m (≈ 80 ft)		**H1G**
30 m (≈ 100 ft)		**H1H**
40 m (≈ 130 ft)		**H1J**
50 m (≈ 160 ft)		**H1K**
60 m (≈ 200 ft)		**H1L**
70 m (≈ 230 ft)		**H1M**
80 m (≈ 265 ft)		**H1N**
90 m (≈ 295 ft)		**H1P**
100 m (≈ 330 ft)		**H1Q**
125 m (≈ 410 ft)		**H1R**
150 m (≈ 495 ft)		**H1S**
175 m (≈ 575 ft)		**H1T**
200 m (≈ 650 ft)		**H1U**
225 m (≈ 740 ft)		**H1V**
250 m (≈ 820 ft)		**H1W**
275 m (≈ 900 ft)		**H1X**
300 m (≈ 990 ft)		**H2A**
350 m (≈ 1150 ft)		**H2B**
400 m (≈ 1320 ft)		**H2C**
450 m (≈ 1480 ft)		**H2D**
500 m (≈ 1650 ft)		**H2E**
550 m (≈ 1815 ft)		**H2F**
600 m (≈ 1980 ft)		**H2G**
650 m (≈ 2145 ft)		**H2H**
700 m (≈ 2310 ft)		**H2J**
750 m (≈ 2475 ft)		**H2K**
800 m (≈ 2640 ft)		**H2L**
850 m (≈ 2800 ft)		**H2M**
900 m (≈ 2970 ft)		**H2N**
950 m (≈ 3135 ft)		**H2P**
1000 m (≈ 3300 ft)		**H2Q**
Other special cable length Please add „-Z" to Article No. and specify Order codes and plain text: H1Y: Cable length ..... Y01: Measuring range	**9X**	**H1Y** **+** **Y01**

1

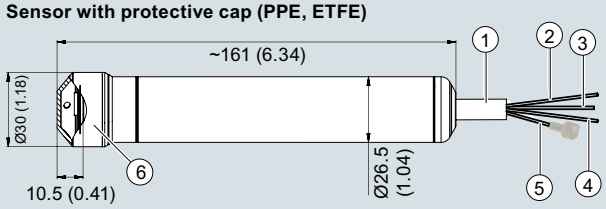
SITRANS LH300 Transmitter for hydrostatic level

Selection and ordering data	Article No.	Order code
Pressure transmitter SITRANS LH300 (submersible sensor)	**7MF1575-**	
FEP cable for aggressive media		
Special cable length Please add „-Z" to Article No. and specify Order code and plain text: Y01: Cable length	**9X**	**H..** **+** **Y01**
3 m (≈ 10 ft)		**H5A**
5 m (≈ 16 ft)		**H5B**
7 m (≈ 23 ft)		**H5C**
10 m (≈ 33 ft)		**H5D**
15 m (≈ 50ft)		**H5E**
20 m (≈ 65 ft)		**H5F**
25 m (≈ 80 ft)		**H5G**
30 m (≈ 100 ft)		**H5H**
40 m (≈ 130 ft)		**H5J**
50 m (≈ 160 ft)		**H5K**
60 m (≈ 200 ft)		**H5L**
70 m (≈ 230 ft)		**H5M**
80 m (≈ 265 ft)		**H5N**
90 m (≈ 295 ft)		**H5P**
100 m (≈ 330 ft)		**H5Q**
125 m (≈ 410 ft)		**H5R**
150 m (≈ 495 ft)		**H5S**
175 m (≈ 575 ft)		**H5T**
200 m (≈ 650 ft)		**H5U**
225 m (≈ 740 ft)		**H5V**
250 m (≈ 820 ft)		**H5W**
275 m (≈ 900 ft)		**H5X**
300 m (≈ 990 ft)		**H6A**
350 m (≈ 1150 ft)		**H6B**
400 m (≈ 1320 ft)		**H6C**
450 m (≈ 1480 ft)		**H6D**
500 m (≈ 1650 ft)		**H6E**
550 m (≈ 1815 ft)		**H6F**
600 m (≈ 1980 ft)		**H6G**
650 m (≈ 2145 ft)		**H6H**
700 m (≈ 2310 ft)		**H6J**
750 m (≈ 2475 ft)		**H6K**
800 m (≈ 2640 ft)		**H6L**
850 m (≈ 2800 ft)		**H6M**
900 m (≈ 2970 ft)		**H6N**
950 m (≈ 3135 ft)		**H6P**
1000 m (≈ 3300 ft)		**H6Q**
Other special cable length Please add „-Z" to Article No. and specify Order codes and plain text: H1Y: Cable length ..... Y01: Measuring range	**9X**	**H5Y** **+** **Y01**

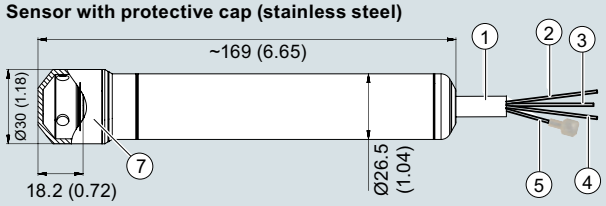
Selection and ordering data		Article No.	Order code
Pressure transmitter SITRANS LH300 (submersible sensor)		**7MF1575-**	
Enclosure material	**Material of protective cap**		
Stainless steel 316L (1.4404)	Protective capability made of PPE (recommended for PE cable)	**A**	
Stainless steel 316L (1.4404)	Protective cap made of ETFE (standard with FEP cable)	**B**	
Stainless steel 316L (1.4404)	Stainless steel 316L (1.4404)	**C**	
Stainless steel 904L (1.4539) for sea water applications	Protective cap PPE	**D**	
Stainless steel 904L (1.4539) for sea water applications	Protective cap ETFE	**E**	
Stainless steel 904L (1.4539) for seawater applications	Stainless steel 904L (1.4539) for seawater applications	**F**	
Sealing material between sensor and enclosure			
FPM (Standard)		**1**	
EPDM (for drinking water)		**2**	
Explosion protection			
without		**0**	
With ATEX II1 G Ex ia IIC T4 Ga, IECEx Ex ia IIC T4 Ga and EAC Ex (only possible for cable length ≤ 300 m (990 ft)		**1**	
Additional versions			Order code
Quality test certificate, 5-point factory calibration (IEC 60770-2)			**C11**
Accessories/spare parts			Article No.
Junction box			**7MF1575-8AA**
Cable hanger			**7MF1575-8AB**
Protective caps, PPE, as spare part (10-pack)			**7MF1575-8AD**
Protective caps, ETFE, as spare part (10-pack)			**7MF1575-8AE**
Humidity filters as spare part (10-pack)			**7MF1575-8AF**
Protective cap, stainless steel 316L (1.4404) for waste water applications			**7MF1575-8AG**
Protective cap, stainless steel 904L (1.4539) for sea water applications			**7MF1575-8AH**

Dimensional drawings

Sensor with protective cap (PPE, ETFE)

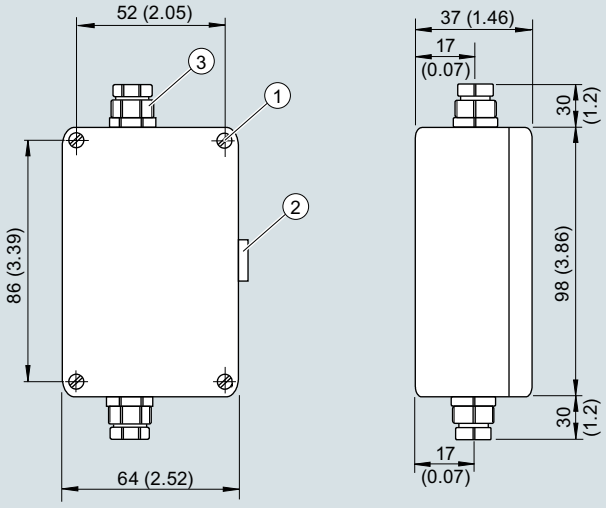


Sensor with protective cap (stainless steel)



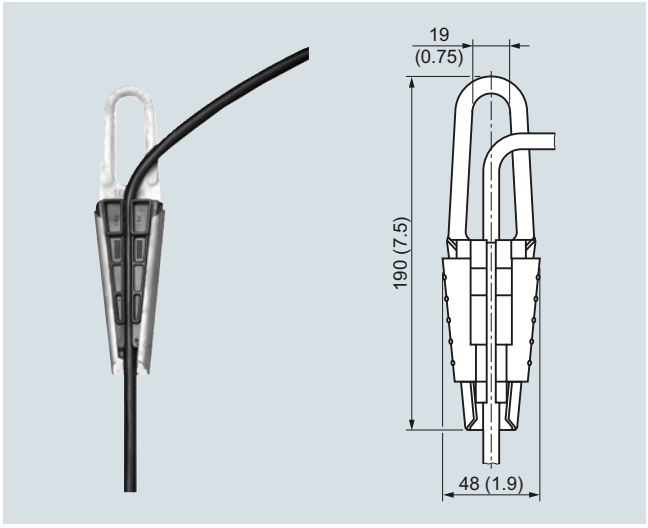
1. Cable, sheat Ø 8.3 (0.33)
2. - (blue)
3. + (brown)
4. Protective conductor connection/Equipotential bonding (black)
5. Vent pipe with humidity filter Ø 1 (0.04) (inner diameter)
6. Protective cap (PPE or PTFE) with 4 x Ø 2.5 (0.10) holes
7. Protective cap (stainless steel) with 4 x Ø 5 (0.20) holes

SITRANS LH300 pressure transmitter, dimensions in mm (inch)



1. Fastening hole
2. Vent valve
3. Cable gland Pg 13.5, cable diameter 6 ... 12 (0.23 ... 0.47)

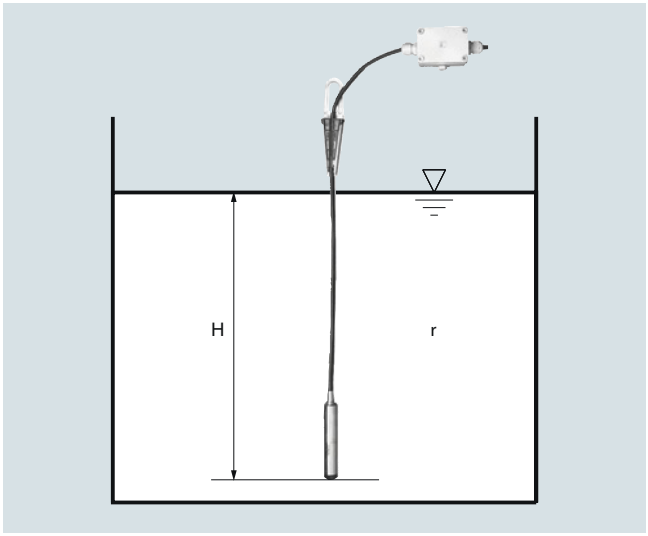
Junction box, dimensions in mm (inch)



Cable hanger, dimensions in mm (inch)

More information

Determination of the measuring range for 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: Water, ρ = 1 000 kg/m^3
Acceleration due to gravity: 9.81 m/s^2
Lower range value: 0 m
Maximum level: 6.0 m
Cable length: 10 m

Calculation:

p = 1 000 kg/m^3 x 9.81 m/s^2 x 6.0 m
p = 58 860 N/m^2
p = 589 mbar

Transmitter to be ordered:
7MF1575-1FA10
Plus, if required, junction box 7MF1575-8AA and cable hanger 7MF1575-8AB

SITRANS P Compact for gauge and absolute pressure

Overview

The SITRANS P Compact pressure transmitter is designed for the special requirements of the food, pharmaceutical and biotechnology industries.

The use of high-grade materials guarantees compliance with hygiene regulations.

Particular value has been placed on a high surface quality. The system can be electropolished in addition.

A further important feature is the hygiene-based design of the process connection by means of various aseptic connections.

The completely welded stainless steel enclosure can be designed up to degree of protection IP67.

Using appropriate thermal decouplers, the SITRANS P Compact pressure transmitter can be used for process temperatures up to 200 °C (392 °F).

Benefits

- Measuring ranges from 0 to 160 mbar (0 to 2.32 psi) to 0 to 40 bar (0 to 580 psi)
- Linearity error including hysteresis < +0.2 % of the end value
- Piezo-resistive measurement system, vacuum-proof and overload-proof
- Hygiene-based design according to EHEDG, FDA and GMP recommendations
- Material and surface quality according to hygiene requirements
- Wetted parts made of stainless steel; completely welded
- Signal output 4 to 20 mA (0 to 20 mA as option)
- Stainless steel enclosure with degree of protection IP65 (IP67 as option)
- Process temperature up to 200 °C (392 °F)
- Explosion protection II 2G Ex [ib] IIC T6 to ATEX
- Easy and safe to clean

Application

The SITRANS P Compact pressure transmitter is designed for the special requirements of the food, pharmaceutical and biotechnology industries.

The use of high-grade materials guarantees compliance with hygiene regulations.

The SITRANS P Compact pressure transmitter is available in many versions. Exact adaptation of the pressure transmitter to conditions at the place of use is thus possible

Design

The electronics is potted to protect it against moisture, corrosive atmospheres and vibration.

Notes on operating the pressure transmitter

Compensation of internal atmospheric pressure

Compensation of the internal atmospheric pressure of the SITRANS P Compact pressure transmitters is performed as follows:

- in the plug versions by means of the screwed gland (IP65)
- in the field enclosures by means of an integral sintered filter (IP65) or a vented cable (IP67)
- in versions with cable outlet by means of a vented cable (IP67)

In the absolute pressure range there is no need for compensation with respect to atmospheric pressure.

Note: These degrees of protection are only achieved under the following conditions:

- if the pressure transmitter is installed correctly
- if the screwed glands are securely tightened
- if the cable diameters agree with the nominal diameters of the gaskets in the enclosure

Note: The integral EMC measures are only effective if the earth connection is made correctly.

CE marking

The CE marking of the pressure transmitter certifies compliance with the guidelines of the European Council (9/336/EC), the EMC law (13.11.1992), as well as the applicable generic standards.

Interference-free operation in systems and plants is achieved only if the specifications for shielding, earthing, cable routing and electrical isolation are observed during installation and assembly.

Hazardous areas

Note: Electrical equipment in hazardous areas must only be installed and operated by trained personnel.

Modifications to units and connections result in cancellation of the explosion protection and guarantee.

With intrinsically-safe circuits, make sure that equipotential bonding exists throughout the complete cabling inside and outside of the hazardous area. The limits specified in the ATEX approval must be observed.

Function

The process pressure acts on a piezo-resistive semiconductor measuring bridge through a remote seal and a transmission liquid. The pressure transmitter converts the pressure values into a load-independent current.

A compensation network makes the output signal largely independent of the ambient temperature. As a result of a specially adapted remote seal connection with minimized volume, the influence of the process temperature on the output signal is greatly reduced compared to a conventional screw connection.

The pressure transmitters can be powered with a non-regulated DC voltage of 10 to 30 V. Output signals common to measuring technology are available.

Technical specifications

Pressure transmitters for food, pharmaceuticals and biotechnology	
Mode of operation	
Measuring principle	piezo-resistive
Input	
Measured variable	gauge or absolute pressure
Measuring range	0 ... 160 mbar (0 ... 2.32 psi) ... 0 ... 40 bar (0 ... 580 psi)
Output	
Output signal	
• 2-wire system	4 ... 20 mA
• Three-wire system	0 ... 20 mA
Measuring accuracy	Acc. to IEC 60770-1
Error in measurement at limit setting incl. hysteresis and reproducibility	≤ 0.2 % of upper range value
Adjustment accuracy	≤ ± 0.2 % of upper range value
Step response time	< 20 ms
Influence of ambient temperature	
On the enclosure	
• Zero point	< 0.2 %/10 K of upper range value
• Measuring span	< 0.2 %/10 K of upper range value
On the process connection (remote seals)	Zero error (depends on design)
• Flange remote seal	
- DN 25 / 1"	4.8 mbar/10 K (0.069 psi/10 K)
- DN 32 / 1¼"	2.3 mbar/10 K (0.033 psi/10 K)
- DN 40 / 1½"	1.6 mbar/10 K (0.023 psi/10 K)
- DN 50 / 2"	0.6 mbar/10 K (0.009 psi/10 K)
• Inline seal	
- DN 25 / 1"	9.5 mbar/10 K (0.14 psi/10 K)
- DN 32 / 1¼"	4.1 mbar/10 K (0.06 psi/10 K)
- DN 40 / 1½"	3.9 mbar/10 K (0.05 psi/10 K)
- DN 50 / 2"	3.9 mbar/10 K (0.05 psi/10 K)

The zero error specified for the process connection should be considered as a guideline for a standard design. We will produce a detailed system calculation on request. Systems with reduced remote seal errors are available on request.

Operating conditions	
Installation conditions	
• Mounting position	Any, vertical as standard
Ambient conditions	
• Ambient temperature	-10 ... +70 °C (14 ... 158 °F)
• Storage temperature	-10 ... +90 °C (14 ... 194 °F)
• Process temperature	Max. 200 °C (392 °F), depending on design
Vacuum-resistant	0 mbar (0 psi) absolute at max. 50 °C. Higher process temperatures on request.
• Degree of protection (to EN 60529)	IP65, optional IP67
• Electromagnetic Compatibility	
- Emitted interference	To EN 50081 Part 1, issue 1993 (residential and industrial areas). The unit has no own emissions.
- Noise immunity to	EN 50082 Part 2, issue March 1995 (industrial areas)
Design	
Weight (without remote seal)	
• Field enclosure	≈ 460 G (≈ 1.01 (lb)
• Enclosure with plug	≈ 200 g (≈ 0.44 lb)
Enclosure	
• Designs	• Field enclosure IP65 or IP67, with screwed gland • Angled plug DIN 43650, IP65 • Cable connection, IP67 • Device plug M12, IP65
• Material	Stainless steel, mat. no. 1.4404/316L/1.4305
Material of union nut	Polyamide (with electrical connection using plug or cable)
	Electronics unit potted with silicone
	Internal ventilation for measuring ranges < 16 bar (< 232 psi), through enclosure thread or connection cable depending on design
Process connection	
• Versions	See ordering data
• Material of coupling	Stainless steel, mat. no. 1.4404/316L
Power supply	
Terminal voltage on transmitter	10 ... 30 V DC
Rated voltage	24 V DC
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	
• For 7MF8010-1... (with diaphragm seal)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
• For 7MF8010-2... (with inline seal)	For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord
Explosion protection	
• Intrinsic safety "i"	TÜV 03 ATEX 2099 X
- Marking	Ex II 2G Ex ib IIC T6

SITRANS P Compact for gauge and absolute pressure

Selection and Ordering data	Article No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front ↗	**7MF8010-**	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA	**1** ■■■■ - ■■■■	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Diaphragm seal with quick-release clamp		
Milk pipe union to DIN 11851 with slotted union nut		
• DN 25	**AD**	
• DN 32	**AE**	
• DN 40	**AF**	
• DN 50	**AG**	
• DN 65	**AH**	
Milk pipe union to DIN 11851 with threaded socket		
• DN 25	**BD**	
• DN 32	**BE**	
• DN 40	**BF**	
• DN 50	**BG**	
• DN 65	**BH**	
Clamp connection to DIN 32676		
• DN 25	**CD**	
• DN 40	**CF**	
• DN 50	**CG**	
Clamp connection to ISO 2852		
• 1 inch	**DM**	
• 1½ inch	**DN**	
• 2 inch	**DP**	
• 2½ inch	**DQ**	
IDF standard with slotted union nut		
• 1 inch	**EM**	
• 1½ inch	**EN**	
• 2 inch	**EP**	
IDF standard with threaded socket		
• 1 inch	**FM**	
• 1½ inch	**FN**	
• 2 inch	**FP**	
SMS standard with slotted union nut		
• 1 inch	**GM**	
• 1½ inch	**GN**	
• 2 inch	**GP**	
SMS standard with threaded socket		
• 1 inch	**HM**	
• 1½ inch	**HN**	
• 2 inch	**HP**	
DRD flange, without welding-type flange		
• DN 50, PN 40	**JH**	
Varivent connection (Tuchenhagen)		
• D = 50, for Varivent enclosure DN 25 and 1 inch	**KF**	
• D = 68, for Varivent enclosure DN 40 ... DN 125 and 1½ ... 6 inch	**KL**	
Special version (add Order code and plain text)	**ZA**	**J1Y**
Filling liquid		
Food oil, FDA-listed	**3**	
Special version (add Order code and plain text)	**9**	**L1Y**
Output signal		
4 ... 20 mA	**1**	
Special version (add Order code and plain text)	**9**	**M1Y**

Selection and Ordering data	Article No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front	**7MF8010-**	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA	**1** ■■■■ - ■■■■	■■■
Diaphragm seal with aseptic connection		
Aseptic screwed gland to DIN 11864-1, form A, with slotted union nut		
• 1 inch	**PM**	
• 1½ inch	**PN**	
• 2 inch	**PP**	
• 2½ inch	**PQ**	
Aseptic screwed gland to DIN 11864-1, form A with threaded socket		
• 1 inch	**QM**	
• 1½ inch	**QN**	
• 2 inch	**QP**	
• 2½ inch	**QQ**	
Aseptic screwed NEUMO with slotted union nut[1)]		
• DN 25	**RD**	
• DN 32	**RE**	
• DN 40	**RF**	
• DN 50	**RG**	
Aseptic screwed NEUMO with threaded socket[1)]		
• DN 25	**SD**	
• DN 32	**SE**	
• DN 40	**SF**	
• DN 50	**SG**	
Aseptic screwed NEUMO with clamp connection, form R[1)]		
• DN 25	**TD**	
• DN 32	**TE**	
• DN 40	**TF**	
• DN 50	**TG**	
Aseptic screwed NEUMO with clamp connection, form V[1)]		
• DN 25	**UD**	
• DN 32	**UE**	
• DN 40	**UF**	
• DN 50	**UG**	
Male thread DIN 3852 Form A		
• G½", min. meas. span 1.6 bar (23.2 psi)	**XA**	
• G¾", min. meas. span 1 bar (14.5 psi)	**XB**	
• G1", min. meas. span 0.4 bar (5.8 psi)	**XC**	
• G1½", min. meas. span 0.25 bar (3.63 psi)	**XD**	
• G2", min. meas. span 0.16 bar (2.32 psi)	**XE**	
Special version (add Order code and plain text)	**ZA**	**J1Y**
Filling liquid		
Food oil, FDA-listed	**3**	
Special version (add Order code and plain text)	**9**	**L1Y**
Output signal		
4 ... 20 mA	**1**	
Special version (add Order code and plain text)	**9**	**M1Y**

[1)] Please specify as well:
Connections for pipes: R01, R02 or R03, see table "Further designs" on next page

Selection and Ordering data		Article No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front		**7MF8010-**	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA		**1** ■■■■ - ■■■■	■■■
Enclosure design (stainless steel mat. No. 1.4404/316L) / electr. connection			
Enclosure with angled plug to DIN 43650, IP65		**1**	
Enclosure with device plug M12, IP65, union nut made of polyamide		**2**	
Enclosure with device plug M12, IP65, union nut made of stainless steel		**3**	
Stainless steel field enclosure (small) with cable gland, IP65		**4**	
Stainless steel field enclosure (small) with cable gland, IP67 Internal ventilation for measuring ranges < 16 bar (< 232 psi)		**5**	
Measured range	**Overload pressure**		
0 ... 160 mbar (0 ... 2.32 psi)	1 bar (14.5 psi)	**BB**	
0 ... 250 mbar (0 ... 3.63 psi)	1 bar (14.5 psi)	**BC**	
0 ... 400 mbar (0 ... 5.8 psi)	3 bar (43.5 psi)	**BD**	
0 ... 600 mbar (0 ... 8.7 psi)	3 bar (43.5 psi)	**BE**	
0 ... 1 bar (0 ... 14.5 psi)	3 bar (43.5 psi)	**CA**	
0 ... 1.6 bar (0 ... 23.2 psi)	10 bar (145 psi)	**CB**	
0 ... 2.5 bar (0 ... 36.3 psi)	10 bar (145 psi)	**CC**	
0 ... 4 bar (0 ... 58 psi)	20 bar (290 psi)	**CD**	
0 ... 6 bar (0 ... 87 psi)	60 bar (870 psi)	**CE**	
0 ... 10 bar (0 ... 145 psi)	60 bar (870 psi)	**DA**	
0 ... 16 bar (0 ... 232 psi)	60 bar (870 psi)	**DB**	
0 ... 25 bar (0 ... 363 psi)	60 bar (870 psi)	**DC**	
0 ... 40 bar (0 ... 580 psi)	100 bar (1450 psi)	**DD**	
-160 ... 0 mbar (-2.32 ... 0 psi)	1 bar (14.5 psi)	**EB**	
-250 ... 0 bar (-3.73 ... 0 psi)	1 bar (14.5 psi)	**EC**	
-400 ... 0 bar (-5.8 ... 0 psi)	3 bar (43.5 psi)	**ED**	
-600 ... 0 bar (-8.7 ... 0 psi)	3 bar (43.5 psi)	**EE**	
-1 ... 0 bar (-14.5 ... 0 psi)	3 bar (43.5 psi)	**FA**	
-1 ... 0.6 bar (-14.5 ... 8.7 psi)	10 bar (145 psi)	**FB**	
-1 ... 1.5 bar (-14.5 ... 21.8 psi)	10 bar (145 psi)	**FC**	
-1 ... 3 bar (-14.5 ... 43.5 psi)	20 bar (290 psi)	**FD**	
-1 ... 5 bar (-14.5 ... 72.5 psi)	20 bar (290 psi)	**FE**	

Selection and Ordering data		Article No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front		**7MF8010-**	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA		**1** ■■■■ - ■■■■	■■■
Measured range	**Overload pressure**		
(continued)			
-1 ... +9 bar (-14.5 ... +130.5 psi)	60 bar (870 psi)	**GA**	
-1 ... +15 bar (-14.5 ... +217.6 psi)	60 bar (870 psi)	**GB**	
0 ... 1 bar a (0 ... 14.5 psi a)	3 bar a (43.5 psi a)	**HA**	
0 ... 1.6 bar a (0 ... 23.2 psi a)	10 bar (145 psi)	**HB**	
0 ... 2.5 bar a (0 ... 36.3 psi a)	10 bar a (145 psi a)	**HC**	
0 ... 4 bar a (0 ... 58 psi a)	10 bar a (145 psi a)	**HD**	
0 ... 6 bar a (0 ... 87 psi a)	60 bar a (870 psi a)	**HE**	
0 ... 10 bar a (0 ... 145 psi a)	60 bar a (870 psi a)	**JA**	
Special version (add Order code and plain text)		**ZA**	**P1Y**
Explosion protection			
without		**1**	
with, to ATEX 100a, II 2 G, Ex ib IIC T6		**2**	
Further designs		Order code	
Please add "**-Z**" to Article No. and specify Order code			
Hygiene version Roughness of process connection: Foil R_a < 0.8 µm ($3.15 \cdot 10^{-8}$ inch); Welded seams R_a < 1.5 µm ($5.9 \cdot 10^{-8}$ inch)		**P01**	
Integral cooling element Process temperature max. 200 °C (392 °F) instead of 140 °C (284 °F)		**K01**	
Connections for pipe			
Pipes to DIN 11850		**R01**	
ISO pipes to DIN 2463		**R02**	
Pipes to O. D. Tubing "BS 4825 Part 1"		**R03**	
Certificates			
Quality test certificate, 5-point factory calibration (IEC 60770-2)		**C11**	
Inspection certificate to EN 10204-3.1		**C12**	
Use of FDA-listed remote seal filling liquids certified by factory certificate according to EN 10204-2.2		**C17**	
Roughness depth measurement R_a certified by tactory certificate according to EN 10204-3.1		**C18**	
Certification to EHEDG for inline seals with aseptic screwed gland to DIN 11864		**C19**	

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SITRANS P Compact for gauge and absolute pressure

Selection and Ordering data	Article No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with inline seal ↗	**7MF8010-**	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA	**2** ■■■■ - ■■■■	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Inline seal (screwed gland at both ends) with quick-release clamps		
Milk pipe union to DIN 11851 with threaded socket		
• DN 25	**AD**	
• DN 32	**AE**	
• DN 40	**AF**	
• DN 50	**AG**	
• DN 65	**AH**	
Clamp connection to DIN 32676		
• DN 25	**CD**	
• DN 32	**CE**	
• DN 40	**CF**	
• DN 50	**CG**	
• DN 65	**CH**	
Clamp connection to ISO 2852[1]		
• 1 inch	**DM**	
• 1½ inch	**DN**	
• 2 inch	**DP**	
• 2½ inch	**DQ**	
Special version (add Order code and plain text)	**ZA**	**J1Y**
Filling liquid		
Food oil, FDA-listed	**3**	
Special version (add Order code and plain text)	**9**	**L1Y**
Output signal		
4 ... 20 mA	**1**	
Special version (add Order code and plain text)	**9**	**M1Y**

[1] Please note the internal diameter of the pipe. Please specify pipe classes (see "Further designs")

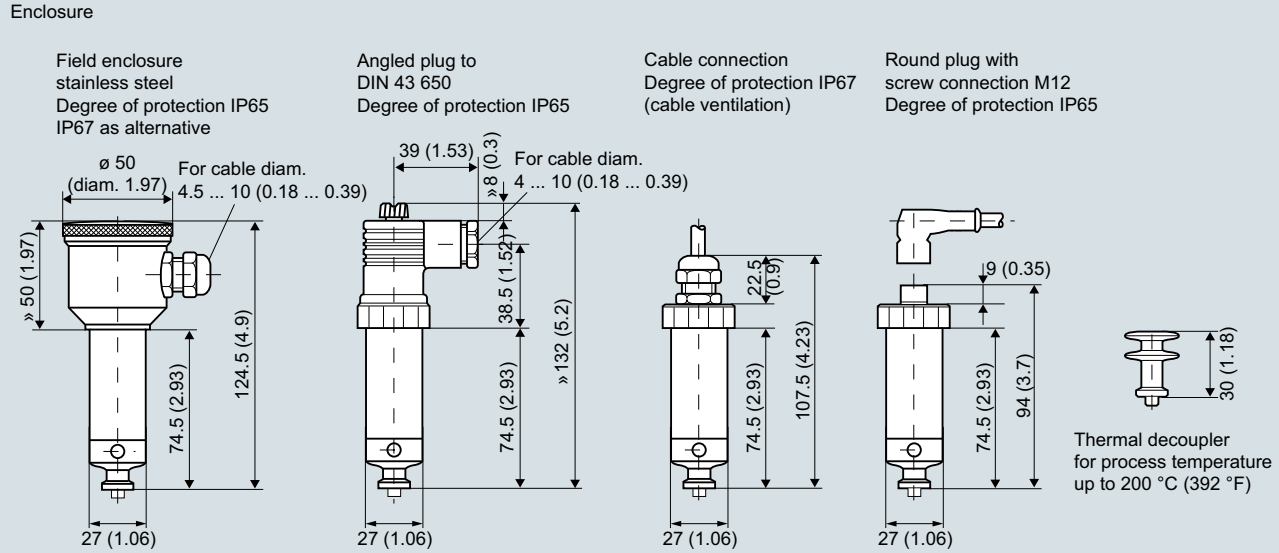
Selection and Ordering data	Article No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with inline seal	**7MF8010-**	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA	**2** ■■■■ - ■■■■	■■■
Inline seal with aseptic connection		
Aseptic screwed gland to DIN 11864-1, form A with threaded socket		
• 1 inch	**QM**	
• 1½ inch	**QN**	
• 2 inch	**QP**	
Aseptic screwed NEUMO with threaded socket[1]		
• DN 25	**SD**	
• DN 32	**SE**	
• DN 40	**SF**	
• DN 50	**SG**	
• DN 65	**SH**	
Aseptic screwed NEUMO with clamp connection, form R[1]		
• DN 25	**TD**	
• DN 32	**TE**	
• DN 40	**TF**	
• DN 50	**TG**	
Aseptic screwed gland SÜDMO with threaded socket W 501 [1]		
• 1 inch	**VM**	
• 1½ inch	**VN**	
• 2 inch	**VP**	
Aseptic screwed gland SÜDMO with clamp connection W 601 [1]		
• 1 inch	**WM**	
• 1½ inch	**WN**	
• 2 inch	**WP**	
Special version (add Order code and plain text)	**ZA**	**J1Y**
Filling liquid		
Food oil, FDA-listed	**3**	
Medicinal white oil	**2**	
Special version (add Order code and plain text)	**9**	**L1Y**
Output signal		
4 ... 20 mA	**1**	
Special version (add Order code and plain text)	**9**	**M1Y**

[1] Please specify as well:
Connections for pipes: R01, R02 or R03, see table "Further designs" on next page

Selection and Ordering data		Article No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with inline seal		**7MF8010-**	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA		**2** ■■■■ - ■■■■	■■■
Enclosure design (stainless steel mat. No. 1.4404/316L) / electr. connection			
Enclosure with angled plug to DIN 43650, IP65, union nut made of polyamide		**1**	
Enclosure with device plug M12, IP65, union nut made of polyamide		**2**	
Enclosure with device plug M12, IP65, union nut made of stainless steel		**3**	
Stainless steel field enclosure (small) with cable gland, IP65		**4**	
Stainless steel field enclosure (small) with cable gland, IP67 Internal ventilation for measuring ranges < 16 bar (< 232 psi)		**5**	
Measured range	**Overload pressure**		
0 ... 160 mbar (0 ... 2.32 psi)	1 bar (14.5 psi)	**BB**	
0 ... 250 mbar (0 ... 3.63 psi)	1 bar (14.5 psi)	**BC**	
0 ... 400 mbar (0 ... 5.8 psi)	3 bar (43.5 psi)	**BD**	
0 ... 600 mbar (0 ... 8.7 psi)	3 bar (43.5 psi)	**BE**	
0 ... 1 bar (0 ... 14.5 psi)	3 bar (43.5 psi)	**CA**	
0 ... 1.6 bar (0 ... 23.2 psi)	10 bar (145 psi)	**CB**	
0 ... 2.5 bar (0 ... 36.3 psi)	10 bar (145 psi)	**CC**	
0 ... 4 bar (0 ... 58 psi)	20 bar (290 psi)	**CD**	
0 ... 6 bar (0 ... 87 psi)	60 bar (870 psi)	**CE**	
0 ... 10 bar (0 ... 145 psi)	60 bar (870 psi)	**DA**	
0 ... 16 bar (0 ... 232 psi)	60 bar (870 psi)	**DB**	
0 ... 25 bar (0 ... 363 psi)	60 bar (870 psi)	**DC**	
0 ... 40 bar (0 ... 580 psi)	100 bar (1450 psi)	**DD**	
-160 ... 0 mbar (-2.32 ... 0 psi)	1 bar (14.5 psi)	**EB**	
-250 ... 0 bar (-3.73 ... 0 psi)	1 bar (14.5 psi)	**EC**	
-400 ... 0 bar (-5.8 ... 0 psi)	3 bar (43.5 psi)	**ED**	
-600 ... 0 bar (-8.7 ... 0 psi)	3 bar (43.5 psi)	**EE**	
-1 ... 0 bar (-14.5 ... 0 psi)	3 bar (43.5 psi)	**FA**	
-1 ... 0.6 bar (-14.5 ... 8.7 psi)	10 bar (145 psi)	**FB**	
-1 ... 1.5 bar (-14.5 ... 21.8 psi)	10 bar (145 psi)	**FC**	
-1 ... 3 bar (-14.5 ... 43.5 psi)	20 bar (290 psi)	**FD**	
-1 ... 5 bar (-14.5 ... 72.5 psi)	20 bar (290 psi)	**FE**	

Selection and Ordering data		Article No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with inline seal		**7MF8010-**	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of upper range value Output 4 ... 20 mA		**2** ■■■■ - ■■■■	■■■
Measured range (continued)	**Overload pressure**		
-1 ... 9 bar (-14.5 ... 130.5 psi)	60 bar (870 psi)	**GA**	
-1 ... 15 bar (-14.5 ... 217.6 psi)	60 bar (870 psi)	**GB**	
0 ... 1 bar a (0 ... 14.5 psi a)	3 bar a (43.5 psi a)	**HA**	
0 ... 1.6 bar a (0 ... 23.2 psi a)	10 bar (145 psi)	**HB**	
0 ... 2.5 bar a (0 ... 36.3 psi a)	10 bar a (145 psi a)	**HC**	
0 ... 4 bar a (0 ... 58 psi a)	10 bar a (145 psi a)	**HD**	
0 ... 6 bar a (0 ... 87 psi a)	60 bar a (870 psi a)	**HE**	
0 ... 10 bar a (0 ... 145 psi a)	60 bar a (870 psi a)	**JA**	
Special version (add Order code and plain text)		**ZA**	**P1Y**
Explosion protection			
without		**1**	
with, to ATEX 100a, II 2 G, Ex ib IIC T6		**2**	
Further designs		Order code	
Please add "**-Z**" to Article No. and specify Order code			
Hygiene version Roughness of process connection: Foil R_a < 0.8 µm ($3.15 \cdot 10^{-8}$ inch); Welded seams R_a < 1.5 µm ($5.9 \cdot 10^{-8}$ inch)		**P01**	
Integral cooling element Process temperature max. 200 °C (392 °F) instead of 140 °C (284 °F)		**K01**	
Connections for pipe			
Pipes to DIN 11850		**R01**	
ISO pipes to ISO 2463		**R02**	
Pipes to O. D. Tubing "BS 4825 Part 1"		**R03**	
Certificates			
Quality test certificate, 5-point factory calibration (IEC 60770-2)		**C11**	
Inspection certificate to EN 10204-3.1		**C12**	
Use of FDA-listed remote seal filling liquids certified by factory certificate according to EN 10204-2.2		**C17**	
Roughness depth measurement R_a certified by tactory certificate according to EN 10204-3.1		**C18**	
Certification to EHEDG for inline seals with aseptic screwed gland to DIN 11864		**C19**	

Dimensional drawings

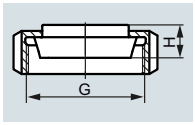


SITRANS P Compact, dimenclosureensions in mm (inch)

Process connections

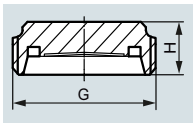
Diaphragm seal with quick-release clamp

Milk pipe union to DIN 11851 with slotted union nut



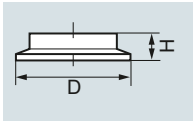
DN	PN	H mm (inch)	G
25	40	24 (0.95)	Rd. 52 x 1/6"
32	40	24 (0.95)	Rd. 58 x 1/6"
40	40	24 (0.95)	Rd. 65 x 1/6"
50	25	25.1 (0.99)	Rd. 78 x 1/6"
65	25	28.6 (1.13)	Rd. 95 x 1/6"

Milk pipe union to DIN 11851 with threaded socket



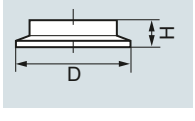
DN	PN	H mm (inch)	G
25	40	-	Rd. 52 x 1/6"
32	40	20 (0.79)	Rd. 58 x 1/6"
40	40	20 (0.79)	Rd. 65 x 1/6"
50	25	20 (0.79)	Rd. 78 x 1/6"
65	25	22 (0.87)	Rd. 95 x 1/6"

Clamp connection to DIN 32676



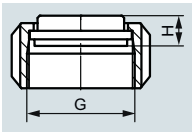
DN	PN	H mm (inch)	D mm (inch)
25	16	14 (0.55)	50.5 (2)
40	16	14 (0.55)	50.5 (2)
50	16	14 (0.55)	64 (2.52)

Clamp connection to ISO 2852



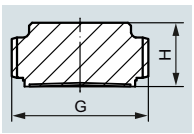
DN	PN	H mm (inch)	D mm (inch)
1"	16	14 (0.55)	50.5 (2)
1½"	16	12 (0.47)	50.5 (2)
2"	16	14 (0.55)	64 (2.52)
2½"	16	14 (0.55)	77.5 (3.05)

IDF standard with slotted union nut



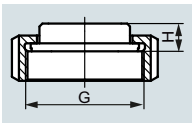
DN	PN	H mm (inch)	G inch (IDF thread)
1"	40	21 (0.83)	1"
1½"	40	13.5 (0.53)	1½"
2"	25	15 (0.59)	2"

IDF standard with threaded socket



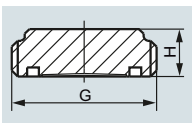
DN	PN	H mm (inch)	G inch (IDF thread)
1"	40	21 (0.83)	1"
1½"	40	13.5 (0.53)	1½"
2"	25	15 (0.59)	2"

SMS standard with slotted union nut



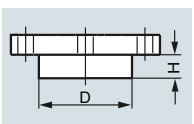
DN	PN	H mm (inch)	G
1"	40	16 (0.63)	Rd 40 x 1.6"
1½"	40	16 (0.63)	Rd 60 x 1.6"
2"	25	16 (0.63)	Rd 70 x 1.6"

SMS standard with threaded socket



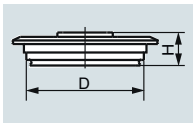
DN	PN	H mm (inch)	G
1"	40	16 (0.63)	Rd 40 x 1.6"
1½"	40	20 (0.79)	Rd 60 x 1.6"
2"	25	20 (0.79)	Rd 70 x 1.6"

DRD flange, without welding-type flange



DN	PN	H mm (inch)	D mm (inch)
50	40	16.7 (0.66)	65.5 (2.58)

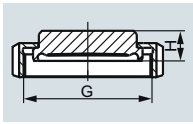
Varivent connection



DN	PN	H mm (inch)	D mm (inch)
25	25	19 (0.75)	50 (1.97)
40 ... 125	25/10	19 (0.75)	68 (2.68)

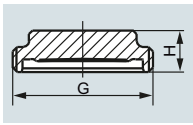
Diaphragm seal with aseptic connection

Aseptic screwed gland to DIN 11864-1, form A, with slotted union nut



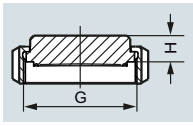
DN	PN	H mm (inch)	G
1"	40	20 (0.79)	Rd 52 x 1/6"
1½"	40	20 (0.79)	Rd 58 x 1/6"
2"	25	20 (0.79)	Rd 65 x 1/6"
2½"	25	20 (0.79)	Rd 78 x 1/6"

Aseptic screwed gland to DIN 11864-1, form A, with threaded socket



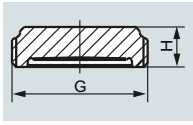
DN	PN	H mm (inch)	G
1"	40	15 (0.59)	Rd 52 x 1/6"
1½"	40	15 (0.59)	Rd 58 x 1/6"
2"	25	15 (0.59)	Rd 65 x 1/6"
2½"	25	15 (0.59)	Rd 78 x 1/6"

Aseptic screwed NEUMO BioConnect with slotted union nut



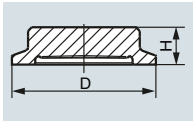
DN	PN	H mm (inch)	G
25	16	15 (0.59)	M 42 x 2
32	16	15 (0.59)	M 52 x 2
40	16	15 (0.59)	M 56 x 2
50	16	15 (0.59)	M 68 x 2

Aseptic screwed NEUMO BioConnect with threaded socket



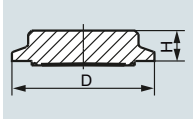
DN	PN	H mm (inch)	G
25	16	20 (0.79)	M 42 x 2
32	16	20 (0.79)	M 52 x 2
40	16	20 (0.79)	M 56 x 2
50	16	20 (0.79)	M 68 x 2

Aseptic screwed NEUMO BioConnect with clamp connection, form R



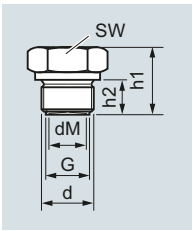
DN	PN	H mm (inch)	D mm (inch)
25	40	20 (0.79)	50.5 (2)
32	40	20 (0.79)	50.5 (2)
40	40	20 (0.79)	64 (2.52)
50	25	20 (0.79)	77.4 (3.05)

Aseptic screwed NEUMO BioConnect with clamp connection, form V



DN	PN	H mm (inch)	D mm (inch)
25	40	15 (0.59)	50.5 (2)
32	40	15 (0.59)	50.5 (2)
40	40	15 (0.59)	64 (2.52)
50	25	15 (0.59)	77.4 (3.05)

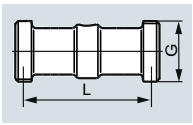
Male thread DIN 3852, form A



G	d mm (inch)	d_M mm (inch)	h_1 mm (inch)	h_2 mm (inch)	SW mm (inch)
G½A	26 (1.02)	17.5 (0.69)	27 (1.06)	14 (0.55)	27 (1.06)
G¾A	32 (1.26)	22.6 (0.89)	31 (1.22)	16 (0.63)	32 (1.26)
G1A	39 (1.54)	27 (1.06)	33 (1.30)	18 (0.71)	51 (2.01)
G1½A	55 (2.17)	40 (1.57)	40 (1.57)	22 (0.87)	55 (2.17)
G2A	68 (2.68)	51 (2.00)	42 (1.65)	24 (0.94)	70 (2.76)

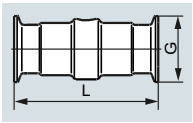
Inline seal (screwed gland at both ends) with quick-release clamps

Milk pipe union to DIN 11851 with threaded socket



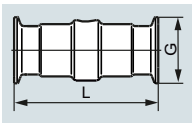
DN	PN	L mm (inch)	G
25	40	110 (4.33)	Rd 52 x 1/6"
32	40	110 (4.33)	Rd 58 x 1/6"
40	40	110 (4.33)	Rd 65 x 1/6"
50	25	110 (4.33)	Rd 78 x 1/6"
65	25	110 (4.33)	Rd 95 x 1/6"

Clamp connection to DIN 32676



DN	PN	L mm (inch)	D mm (inch)
25	16	110 (4.33)	50.5 (2)
32	16	110 (4.33)	50.5 (2)
40	16	110 (4.33)	50.5 (2)
50	16	110 (4.33)	64 (2.52)
65	10	110 (4.33)	91 (3.58)

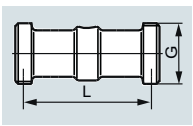
Clamp connection to ISO 2852



DN	PN	L mm (inch)	D mm (inch)
1"	16	110 (4.33)	50.5 (2)
1½"	16	110 (4.33)	50.5 (2)
2"	16	110 (4.33)	64 (2.52)
2½"	16	110 (4.33)	91 (3.58)

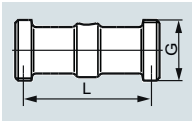
Inline seal with aseptic connection

Aseptic screwed gland to DIN 11864-1, form A, with threaded socket



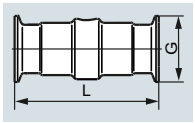
DN	PN	L mm (inch)	G
1"	40	110 (4.33)	Rd 52 x 1/6"
1½"	40	110 (4.33)	Rd 65 x 1/6"
2"	25	110 (4.33)	Rd 78 x 1/6"

Aseptic screwed NEUMO BioConnect with threaded socket



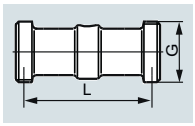
DN	PN	L mm (inch)	G
25	16	110 (4.33)	M 42 x 2
32	16	110 (4.33)	M 52 x 2
40	16	110 (4.33)	M 56 x 2
50	16	110 (4.33)	M 68 x 2
65	16	110 (4.33)	M 90 x 3

Aseptic screwed NEUMO BioConnect with clamp connection, form R



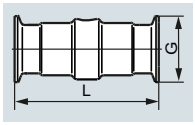
DN	PN	L mm (inch)	D mm (inch)
25	16	110 (4.33)	50.4 (2)
32	16	110 (4.33)	50.4 (2)
40	16	110 (4.33)	64 (2.52)
50	16	110 (4.33)	77.4 (3.05)

Aseptic screwed gland SÜDMO with threaded socket W 501



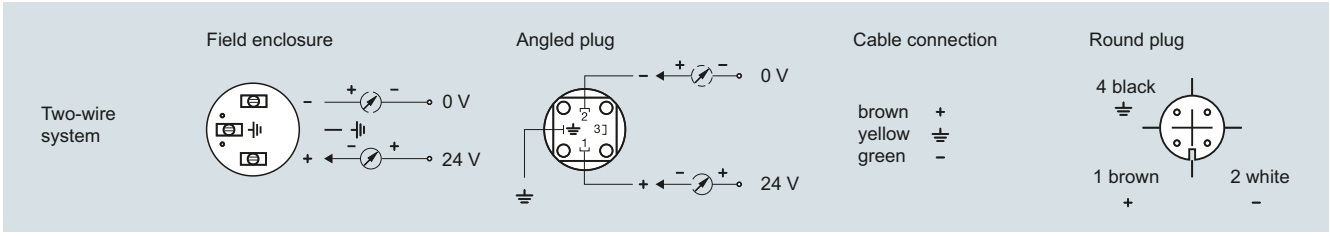
DN	PN	L mm (inch)	G
1"	25	110 (4.33)	Rd 44 x 1/6"
1½"	25	110 (4.33)	Rd 58 x 1/6"
2"	20	110 (4.33)	Rd 78 x 1/6"

Aseptic screwed gland SÜDMO with threaded socket W 601



DN	PN	L mm (inch)	D mm (inch)
1"	16	110 (4.33)	50.5 (2)
1½"	16	110 (4.33)	64 (2.52)
2"	16	110 (4.33)	77.5 (3.05)

Schematics



SITRANS P Compact, connection diagram

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 number 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 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 enclosure. 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
- Minimum conformity error
- Small long-term drift
- Wetted parts made of high-grade materials (such as stainless steel, Hastelloy)
- Measuring range 0.008 bar to 400 bar (0.1 psi to 5802 psi)
- 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" Ex 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 0.01 bar (0.15 psi), the largest is 400 bar (5802 psi).

Level

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

For measuring the level in an open container you require one device; for measuring the level in a closed container, you require two devices and a process control system.

Absolute pressure

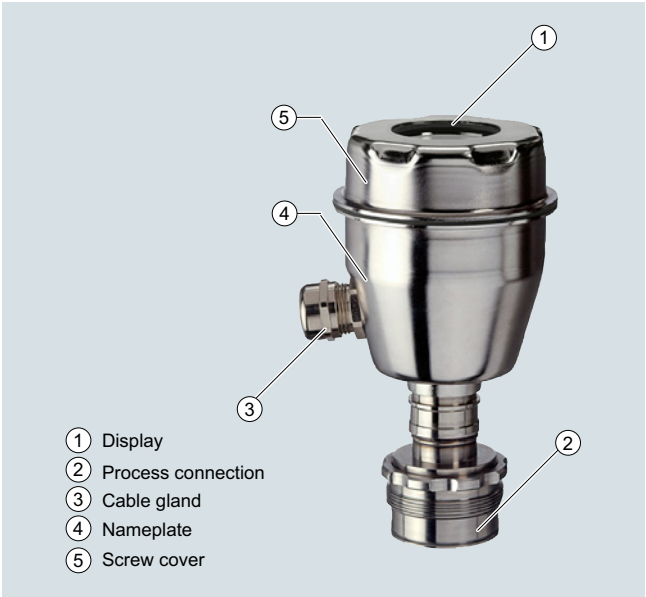
This variant measures the absolute pressure of aggressive, non-aggressive and hazardous gases, vapors and liquids.

The smallest measuring span is 0.008 bar a (0.12 psi a), the largest is 30 bar a (435 psi a).

Design

The device comprises:

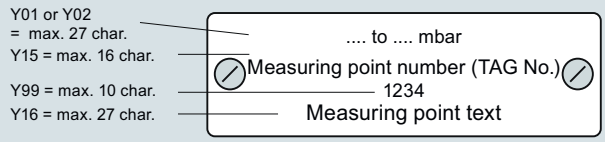
- Electronics
- Enclosure
- Measuring cell



Perspective view of SITRANS P300

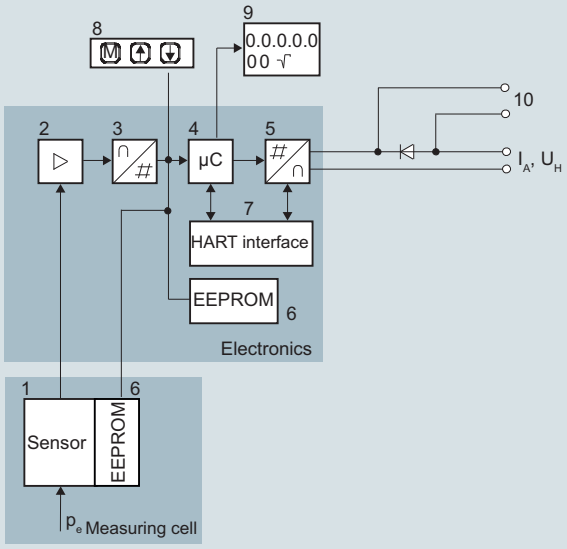
The enclosure has a screw-on lid (5) and, depending on the version, is with or without an inspection window. The electrical terminal enclosure, the buttons for operation of the device are located under this lid and, depending on the version, the display. The connections for the auxiliary power U_H and the shield are in the terminal enclosure. The cable gland is mounted on the side of the enclosure. The measuring cell with the process connection (2) is located on the bottom of the enclosure. 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



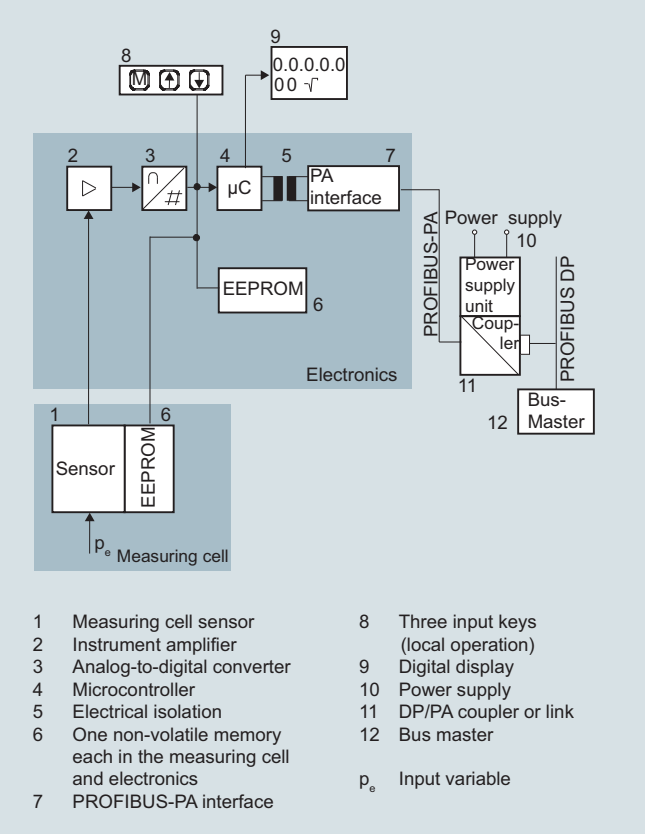
1 Measuring cell sensor
2 Instrument amplifier
3 Analog-to-digital converter
4 Microcontroller
5 Digital-to-analog converter
6 One non-volatile memory each in the measuring cell and electronics
7 HART interface
8 Three input keys (local operation)
9 Digital display
10 Diode circuit and connection for 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 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).

Operation of electronics with PROFIBUS PA communication



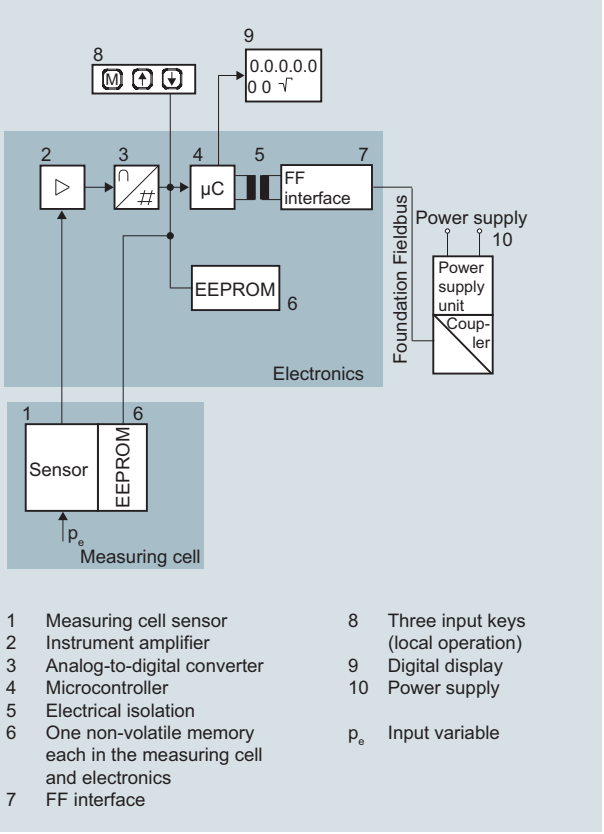
1 Measuring cell sensor
2 Instrument amplifier
3 Analog-to-digital converter
4 Microcontroller
5 Electrical isolation
6 One non-volatile memory each in the measuring cell and electronics
7 PROFIBUS-PA interface
8 Three input keys (local operation)
9 Digital display
10 Power supply
11 DP/PA coupler or 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 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 the result of this modular design, the electronics and the measuring cell can be replaced separately from each other.

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

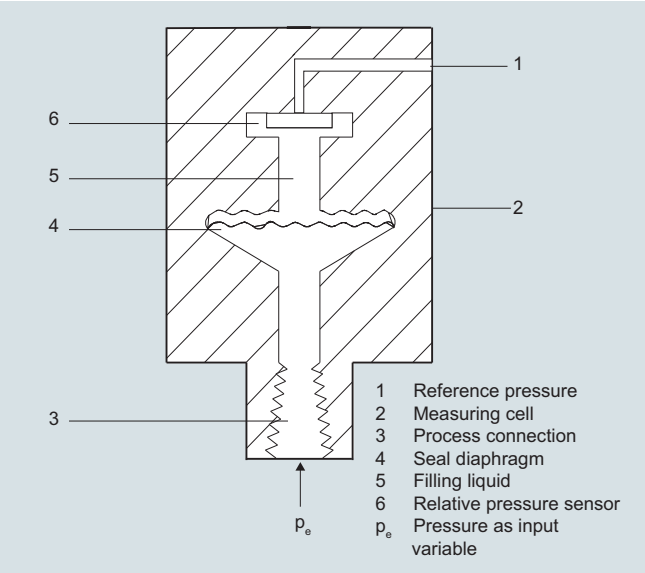
The results with status values and diagnostic values are transferred by cyclic data transmission on the FOUNDATION Fieldbus. Parameterization data and error messages are transferred by acyclic data transmission. Special software such as National Instruments Configurator is required for this.

Mode of operation of the measuring cells

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

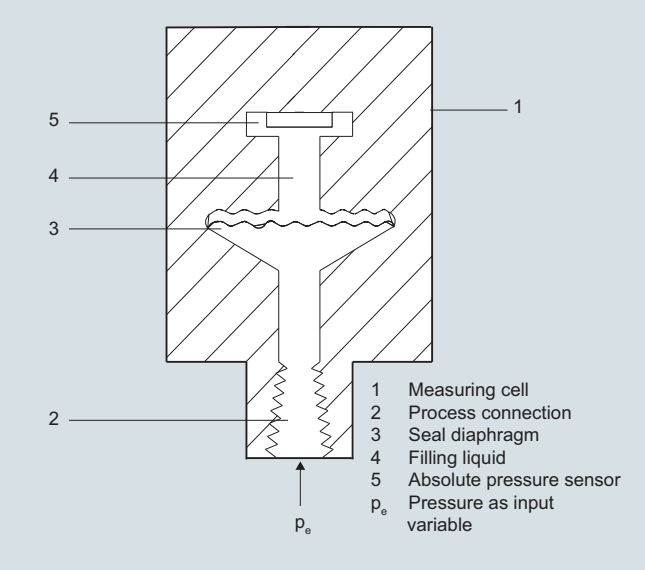


Measuring cell for gauge pressure, function diagram

The input pressure (p_e) is transferred to the gauge pressure sensor (6) via the seal diaphragm (4) and the filling liquid (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.

Transmitters with measuring spans ≤ 63 bar (≤ 926.1 psi) measure the input pressure compared to atmospheric, transmitters with measuring spans of ≥ 160 bar (≥ 2352 psi) compared to a vacuum.

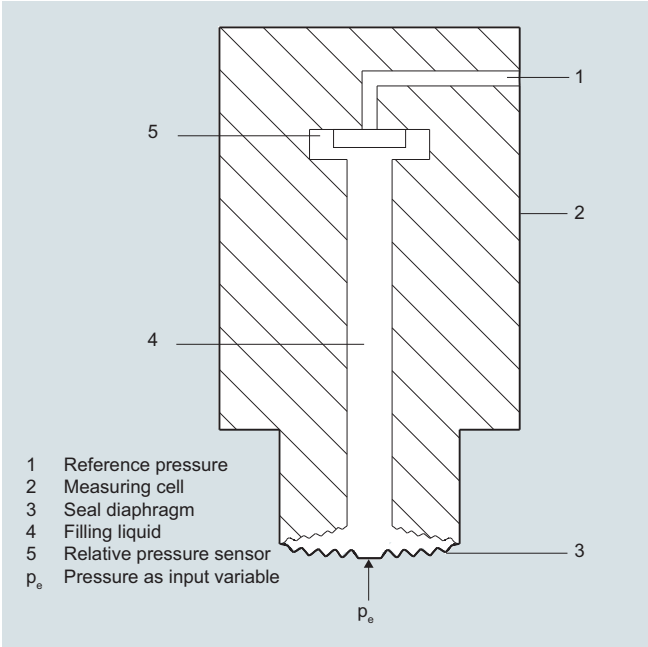
Measuring cell for absolute pressure



Measuring cell for absolute pressure, function diagram

The input pressure (p_e) is transferred to the absolute pressure sensor (5) via the seal diaphragm (3) and the filling liquid (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

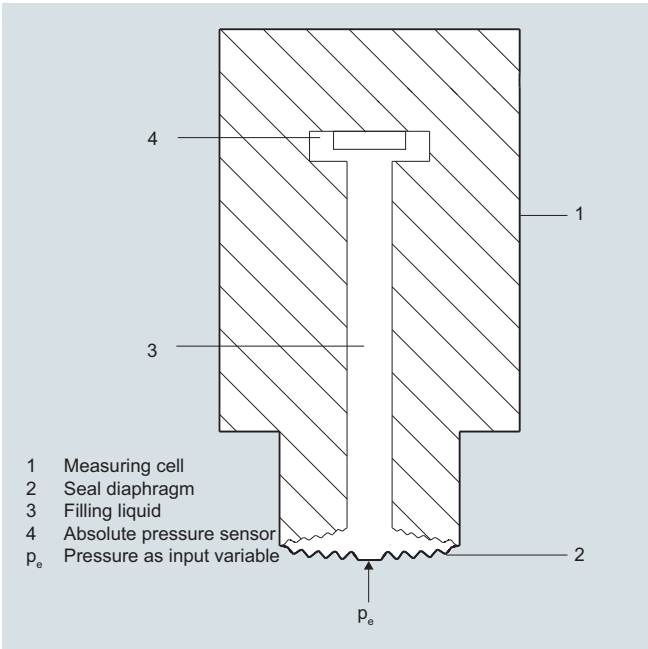


Measuring cell for gauge pressure, front-flush diaphragm, function diagram

The input pressure (p_e) is transferred to the gauge pressure sensor (6) via the seal diaphragm (4) and the filling liquid (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.

Transmitters with measuring spans ≤ 63 bar (≤ 926.1 psi) measure the input pressure compared to atmospheric, transmitters with measuring spans of ≥ 160 bar (≥ 2352 psi) compared to a vacuum.

Measuring cell for absolute pressure, front-flush diaphragm



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

The input pressure (p_e) is transferred to the absolute pressure sensor (5) via the seal diaphragm (3) and the filling liquid (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

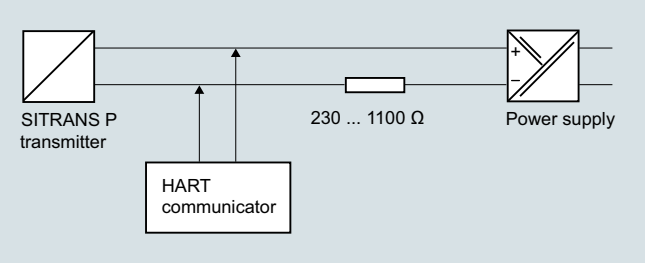
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

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

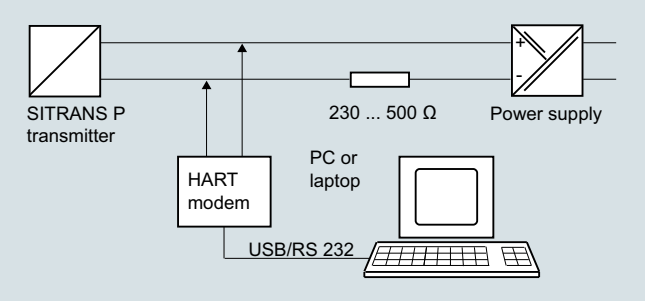
Parameterization using HART communication

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	Input keys	HART communication
Lower range value	x	x
Upper range value	x	x
Electrical damping	x	x
Lower range value without application of a pressure ("Blind setting")	x	x
Upper range 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
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

[1)] Cancel apart from write protection

Diagnostic functions for SITRANS P300 with HART communication

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

Available physical units of display for SITRANS P300 with HART communication

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_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 with PROFIBUS PA and FOUNDATION Fieldbus

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

Diagnostic functions for SITRANS P300 with PROFIBUS PA and FOUNDATION Fieldbus

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

Physical dimensions available for the display

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

Hygiene 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

Gauge pressure input

Measured variable

Measuring span (infinitely adjustable) or nominal measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

(for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)

HART	**PROFIBUS PA/ FOUNDATION Fieldbus**		
Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
8.3 ... 250 mbar 0.83 ... 25 kPa 0.12 ... 3.6 psi	250 mbar 25 kPa 3.6 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 psi	10 bar 1 MPa 145 psi
0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
0.63 ... 63 bar 63 ... 6300 kPa 9.1 ... 914 psi	63 bar 6300 kPa 914 psi	67 bar 6.7 MPa 972 psi	100 bar 10 MPa 1450 psi
1.6 ... 160 bar 0.16 ... 16 MPa 23 ... 2321 psi	160 bar 16 MPa 2321 psi	167 bar 16.7 MPa 2422 psi	250 bar 2.5 MPa 3626 psi
4 ... 400 bar 0.4 ... 40 kPa 58 ... 5802 psi	400 bar 40 kPa 5802 psi	400 bar 40 MPa 5802 psi	600 bar 60 MPa 8700 psi

Lower measuring limit

(for 250mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.)

- Measuring cell with silicone oil: 30 mbar a/3 kPa a/0.44 psi a
- Measuring cell with inert filling liquid: 30 mbar a/3 kPa a/0.44 psi a

Upper measuring limit: 100 % of max. measuring span
(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 ° (140 °F) ambient temperature/temperature of medium)

Absolute pressure input

Measured variable: Absolute pressure

Measuring span (infinitely adjustable) or nominal measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)

HART	**PROFIBUS PA/ FOUNDATION Fieldbus**		
Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
8.34 ... 250 mbar a 0.83 ... 25 kPa a 3.35 ... 100 inH_2O a 0.13 ... 3.63 psi a	250 mbar a 25 kPa a 100 inH_2O a	1.5 bar a 150 kPa a 21.8 psi a	6 bar a 600 kPa a 87 psi a
43.34 ... 1300 mbar a 4.33 ... 130 kPa a 17.42 ... 522.4 inH_2O a 0.63 ... 18.86 psi a	1300 mbar a 130 kPa a 525 inH_2O	2.6 bar a 260 kPa a 37.7 psi a	10 bar a 1 MPa a 145 psi a
0.17 ... 5 bar a 17 ... 500 kPa a 2.43 ... 72,5 psi a	5000 mbar a 500 kPa a 72.5 psi a	10 bar a 1 MPa a 145 psi a	30 bar a 3 MPa a 435 psi a
1 ... 30 bar a 0.1 ... 3 MPa a 14.6 ... 435 psi a	30 bar a 3 MPa a 435 psi a	45 bar a 4.5 MPa a 653 psi a	100 bar a 10 MPa a 1450 psi a

SITRANS P300 for gauge and absolute pressure

Lower measuring limit				
• Measuring cell with silicone oil	0 mbar a/0 kPa a /0 psi a			
• Measuring cell with inert filling liquid				
- for temperature of medium -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)	30 mbar a/3 kPa a/0.44 psi a			
- for temperature of medium 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < ϑ ≤ +212 °F (max. 185 °F for meas. cell 435 psi))	30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C 3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C 0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F			
Upper measuring limit	100 % of max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi und 60 °C (140 °F) ambient temperature/temperature of medium)			
Lower range value	Between the measuring limits (fully adjustable)			
Input of gauge pressure, with front-flush diaphragm				
Measured variable	Gauge pressure, front-flush			
Measuring span (infinitely adjustable) or nominal measuring range, max. permissible operating pressure and max. test pressure	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**		
	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi)
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 psi	10 bar 1 MPa 145 psi
	0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
	0.63 ... 63 bar 63 ... 6300 kPa 9.1 ... 914 psi	63 bar 6300 kPa 914 psi	67 bar 6.7 MPa 972 psi	100 bar 10 MPa 1450 psi
Lower measuring limit				
• Measuring cell with silicone oil filling	100 mbar a/10 kPa a/1.45 psi a			
• Measuring cell with inert filling liquid	100 mbar a/10 kPa a/1.45 psi a			
• Measuring cell with Neobee	100 mbar a/10 kPa a/1.45 psi a			
Upper measuring limit	100% of max. measuring span			
Input of absolute pressure, with front-flush diaphragm				
Measured variable	Absolute pressure, front-flush			
Measuring span (infinitely adjustable) or nominal measuring range and max. permissible test pressure	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**		
	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	43 ... 1300 mbar a 4.3 ... 130 kPa a 17 ... 525 inH_2O a	1300 mbar a 130 kPa a 525 inH_2O a	2.6 bar a 260 kPa a 37.7 psi a	10 bar a 1 MPa a 145 psi a
	160 ... 5000 mbar a 16 ... 500 kPa a 2.32 ... 72.5 psi a	5000 mbar a 500 kPa a 72.5 psi a	10 bar a 1 MPa a 145 psi a	30 bar a 3 MPa a 435 psi a
	1 ... 30 bar a 0.1 ... 3 MPa a 14.5 ... 435 psi a	30 bar a 3 MPa a 435 psi a	45 bar a 4.5 MPa a 653 psi a	100 bar a 10 MPa a 1450 psi a
	Depending on the process connection, the measuring span may differ from these values			
Lower measuring limit	0 mbar a/0 kPa a/0 psi a			
Upper measuring limit	100 % of max. measuring span			
Output	**HART**		**PROFIBUS PA/ FOUNDATION Fieldbus**	
Output signal	4 ... 20 mA		Digital PROFIBUS PA or FOUNDATION Fieldbus 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 (step width 0.1 s)	Set to 2 s (0 ... 100 s)			

SITRANS P300 for gauge and absolute pressure		
Measuring accuracy for gauge pressure	According to IEC 60770-1	
Reference conditions	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Measuring cell with silicone oil • Room temperature 25 °C (77 °F)	
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range	
Error in measurement at limit setting incl. hysteresis and reproducibility		
• Linear characteristic		
- 250 mbar/25 kPa/3.6 psi	$r \leq 1.25$: $1.25 < r \leq 30$:	≤ 0.075 % ≤ (0.008 · r + 0.065) %
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi	$r \leq 5$: $5 < r \leq 100$:	≤ 0.075 % ≤ (0.005 · r + 0.05) %
- 400 bar/40 MPa/5802 psi	$r \leq 3$: $3 < r \leq 10$: $10 < r \leq 100$:	≤ 0.075 % ≤ (0.0029 · r + 0.071) % ≤ (0.005 · r + 0.05) %
Influence of ambient temperature (in percent per 28 °C (50 °F))		
• 250 mbar/25 kPa/3.6 psi	≤ (0.16 · r + 0.1) %	
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	≤ (0.07 · r + 0.08) %	
Long-term stability (temperature change ± 30 °C (± 54 °F))		
• 250 mbar/25 kPa/3.6 psi	≤ (0.25 · r) % per year	
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi	≤ (0.25 · r) % in 5 years	
• 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	≤ (0.125 · r) % in 5 years	
Effect of mounting position	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° inclination (zero point correction is possible with position error compensation)	
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V	
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of the nominal measuring range	

SITRANS P300 for gauge and absolute pressure		
Measuring accuracy for absolute pressure	According to IEC 60770-1	
Reference conditions	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Measuring cell with silicone oil • Room temperature 25 °C (77 °F)	
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range	
Error in measurement at limit setting incl. hysteresis and reproducibility		
• Linear characteristic		
- r ≤ 10	≤ 0.1 %	
- 10 < r ≤ 30	≤ 0.2 %	
Influence of ambient temperature (in percent per 28 °C (50 °F))		
• 250 mbar a/25 kPa a/3.6 psi a	≤ (0.15 · r + 0.1) %	
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a	≤ (0.08 · r + 0.16) %	
Long-term stability (temperature change ± 30 °C (± 54 °F))	≤ (0.25 · r) % in 5 years	
Effect of mounting position (in pressure per change in angle)	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° inclination (zero point correction is possible with position error compensation)	
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V	
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of the rated nominal measuring range	
Measuring accuracy for gauge and absolute pressure, with front-flush diaphragm	According to IEC 60770-1	
Reference conditions	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Measuring cell with silicone oil • Room temperature 25 °C (77 °F)	
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range	
Error in measurement at limit setting incl. hysteresis and reproducibility		
• Linear characteristic	**Gauge pressure, with front-flush diaphragm**	**Absolute pressure, with front-flush diaphragm**
- r ≤ 5	≤ 0.075 %	-
- 5 < r ≤ 100	≤ (0.005 · r + 0.05) %	-
- r ≤ 10	-	≤ 0.2 %
- 10 < r ≤ 30	-	≤ 0.4 %
Influence of ambient temperature (as percentage per 28 °C (50 °F))	≤ (0.08 · r + 0.16) %	≤ (0.16 · r + 0.24) %
Effect of temperature of medium (in pressure per temperature change)		
• Temperature difference between temperature of medium and ambient temperature	3 mbar/0.3 kPa/0.04 psi per 10 K	
Long-term stability (temperature change ± 30 °C (± 54 °F))	(0.25 · r) % in 5 years	
Effect of mounting position (in pressure per change in angle)	0.4 mbar/0.04 kPa/0.006 per 10° inclination (zero point correction is possible with position error compensation)	
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V	
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of the nominal measuring range	

SITRANS P300 for gauge and absolute pressure	
Operating 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 flush-mounted diaphragm)	-10 ... +85 °C (14 ... +185 °F)
• Measuring cell with inert liquid	-40 ... +85 °C (-40 ... +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)) (for temperature oil: -10 ... + 85 °C (14 ... +165 °F))
Climatic class	
Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics
Degree of protection	
• according to EN 60529	IP65, IP68
• according to NEMA 250	IP65, IP68, Type 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F)
Electromagnetic Compatibility	
• Emitted interference and interference immunity	Acc. to IEC 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 (FDA-compliant, with flush-mounted diaphragm)	-40 ... +150 °C (-40 ... +302 °F)
• Measuring cell with Neobee oil "Measuring cell with Neobee oil (FDA-compliant, with flush-mounted diaphragm)	-10 ... +150 °C (-14 ... +302 °F)
• Measuring cell with silicone oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)	-40 ... +200 °C (-40 ... +392 °F)
• Measuring cell with Neobee oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)	-10 ... +200 °C (14 ... +392 °F)
• Measuring cell with inert liquid	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with high-temperature oil (only for gauge pressure version with flush-mounted diaphragm)	-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/DIN EN 61518 - M10 as per DIN 19213

SITRANS P300 for gauge and absolute pressure

SITRANS P300 for gauge and absolute pressure		
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)	
Power supply U_H	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 42 V DC for intrinsically safe operation: 10.5 ... 30 V DC	
Power supply	-	Supplied though bus
Separate supply voltage	-	Not necessary
Bus voltage		
• Without Ex	-	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	-	Yes

SITRANS P300 for gauge and absolute pressure		
Certificates and approvals	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 4, paragraph 3 (sound engineering practice)	
Water, waste water	Pending	
Explosion protection		
Intrinsic safety "i"	PTB 05 ATEX 2048	
• Marking	II1/2 G Ex ia IIC/IIB T4/T5/T6 Ga/Gb	
• 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	II 1 D Ex ia IIIC T120 °C Da II 1/2 D Ex ia IIIC T120 °C Da/Db II 2 D Ex ib IIIC T120 °C Db	
• 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:	To certified intrinsically-safe circuits with peak values:
	U_i = 30 V, I_i = 100 mA, P_i = 750 mW	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
Type of protection Ex nA/nL/ic (Zone 2)	PTB 05 ATEX 2048	
• Marking	II 2/3 G Ex ic IIC/IIB T4/T5/T6 Gb/Gc II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc	
• 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/nL 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 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

SITRANS P300 for gauge and absolute pressure

HART Communication	
HART communication	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM
PROFIBUS PA communication	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting Address 126)
Cyclic data usage	
• Output byte	5 (one 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
- Specification of a container characteristic with	Max. 30 nodes
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

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

Selection and Ordering data		Article No.
SITRANS P300 pressure transmitters for relative and absolute pressure, single chamber enclosure, rating plate inscription in English		
4 ... 20 mA/HART ↗		**7MF8023-**
PROFIBUS PA ↗		**7MF8024-**
FOUNDATION Fieldbus (FF) ↗		**7MF8025-**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		■■■■-■■■■
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	**1**
Inert liquid	Cleanliness level 2 to DIN 25410	**3**
Measuring span (min. ... max.)		
8.3 ... 250 mbar	(0.12 ... 3.63 psi)	**A**
0.01 ... 1 bar	(0.145 ... 14.5 psi)	**B**
0.04 ... 4 bar	(0.58 ... 58 psi)	**C**
0.16 ...16 bar	(2.32 ... 232 psi)	**D**
0.63 ... 63 bar	(9.14 ... 914 psi)	**E**
1.6 ... 160 bar	(23.2 ... 2320 psi)	**F**
4 ... 400 bar	(58 ... 5802 psi)	**G**
8.34 ... 250 mbar a	(0.13 ... 3.63 psi a)	**Q**
43.34 ... 1300 mbar a	(0.63 ... 18.86 psi a)	**S**
0.17 ... 5 bar a	(2.43 ... 72.5 psi a)	**T**
1 ... 30 bar a	(14.6 ... 435 psi a)	**U**
Wetted parts materials		
Seal diaphragm	Measuring cell	
Stainless steel	Stainless steel	**A**
Hastelloy	Stainless steel	**B**
Hastelloy	Hastelloy	**C**
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" **(recommended version)** [1) 2) 3) 4) 5)]		**Y**
Process connection		
• Connection shank G½B to EN 837-1		**0**
• Female thread ½-14 NPT		**1**
• Stainless steel oval flange with process connection (Oval flange has no female thread) [6)]		
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518		**2**
- Mounting thread M10 to DIN 19213		**3**
- Mounting thread M12 to DIN 19213		**4**
• Male thread M20 x 1.5		**5**
• Male thread ½ -14 NPT		**6**
Non-wetted parts materials		
• Stainless steel, deep-drawn and electrolytically polished		**4**
Version		
• Standard versions		**1**
Explosion protection		
• None		**A**
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		**B**
• Zone 20/21/22 [7)]		**C**
• Ex nA/nL (Zone 2) [8)]		**E**
• with FM "intrinsic safety" (cFM_{US})		**M**
Electrical connection / cable entry		
• Screwed gland M20x1.5 (polyamide) [9)]		**A**
• Screwed gland M20x1.5 (metal)		**B**
• Screwed gland M20x1.5 (stainless steel)		**C**
• Device plug M12 (stainless steel), without cable socket)		**G**
• Screwed gland ½-14 NPT metal thread [10)]		**H**
• Screwed gland ½-14 NPT stainless steel thread		**J**

Selection and Ordering data	Article No.
SITRANS P300 pressure transmitters for relative and absolute pressure, single chamber enclosure, rating plate inscription in English	
4 ... 20 mA/HART	**7MF8023-**
PROFIBUS PA	**7MF8024-**
FOUNDATION Fieldbus (FF)	**7MF8025-**
	■■■■-■■■■
Display	
• Without display, with keys, closed lid	**1**
• With display and keys, closed lid [11)]	**2**
• With display and keys, lid with polycarbonate disc	**4**
• (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units) [11)]	
• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc [11)]	**5**
• With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS and FOUNDATION Fieldbus equipment: pressure units) [11)]	**6**
• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane [11)]	**7**

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

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

1) When also ordering the quality test 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.

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

3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF802.-..Y..-.... and 7MF4900-1...-.B

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

5) Remote seal for direct mounting only available in combination with process connection ½-14 NPT.

6) M10 fastening thread:
Max. measuring span 160 bar (2320 psi)
7/16-20 UNF and M12 fastening thread:
Max. measuring span 400 bar (5802 psi)

7) Only available together with electrical connection option A

8) Only available together with electrical connection options B, C or G.

9) Only together with HART electronics.

10) Without cable gland.

11) Display cannot be turned.

SITRANS P300 for gauge and absolute pressure

Selection and Ordering data		Article No.
SITRANS P300 pressure transmitters for relative and absolute pressure with front-flush membrane, single chamber enclosure, rating plate inscription in English		
4 ... 20 mA/HART	↗	**7MF8123-**
PROFIBUS PA	↗	**7MF8124-**
FOUNDATION Fieldbus (FF)	↗	**7MF8125-**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		■■■■■-■■■■
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Inert liquid		3
FDA compliant fill fluid		
• Neobee oil	normal	4
Measuring span (min. ... max.)		
0.01 ... 1 bar	(0.15 ... 14.5 psi)	B
0.04 ... 4 bar	(0.58 ... 58 psi)	C
0.16 ... 16 bar	(2.32 ... 232 psi)	D
0.63 ... 63 bar	(9.14 ... 914 psi)	E
43.34 ... 1300 mbar a[1]	(0.63 ... 18.86 psi a)[1]	S
0.17 ... 5 bar a[1]	(2.43 ... 72.5 psi a)[1]	T
1 ... 30 bar a[1]	(14.6 ... 435 psi 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
Explosion protection		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
• Zone 20/21/22[3]		C
• Ex nA/nL (Zone 2)[4]		E
• with FM "intrinsic safety" (cFM$_{US}$)		M
Electrical connection / cable entry		
• Screwed gland M20x1.5 (polyamide)[5]		A
• Screwed gland M20x1.5 (metal)		B
• Screwed gland M20x1.5 (stainless steel)		C
• Device plug M12 (stainless steel), without cable socket)		G
• Screwed gland ½-14 NPT metal thread [6]		H
• Screwed gland ½-14 NPT stainless steel thread [6]		J

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

Power supply units see Chap. 7 "Supplementary Components"

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

1) Not with temperature decoupler P00, not for process connections R01, R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.
2) Only available for flanges with options M.., N.. and Q..
3) Only together with electrical connection option A.
4) Only available together with electrical connection options B, C or G.
5) Only together with HART electronics.
6) Without cable gland.
7) Display cannot be turned.

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Pressure transmitter with mounting bracket (2 shackles, 4 nuts, 4 U-plates, 1 angle) made of: made completely of stainless steel, for wall or pipe mounting	**A02**	✓	✓	✓
Cable socket for device plugs M12				
• Stainless steel	**A51**	✓	✓	✓
Rating plate inscription (instead of English)				
• German	**B10**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
English rating plate Pressure units in in$H_2$0 and/or psi	**B21**	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)[1]	**C11**	✓	✓	✓
Inspection certificate[2] Acc. to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	**C14**	✓	✓	✓
Degree of protection IP65/IP68 (only for M20x1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Degree of protection IP6k9k (only for M20x1.5)	**D46**	✓	✓	✓
CRN approval Canada (Canadian Registration Number)	**E22**	✓	✓	✓
Export approval Korea	**E11**	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)	**E80**	✓	✓	✓
Ex Approval Ex ia/ib NEPSI	**E55**	✓	✓	✓
Only for SITRANS P300 with front-flush diaphragm (7MF81..-...)				
Flange to EN 1092-1, Form B1				
• DN 25, PN 40[3]	**M11**	✓	✓	✓
• 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[4]	**R01**	✓	✓	✓
• G 1"-A, front-flush[4]	**R02**	✓	✓	✓
• G 2"-A, front-flush	**R04**	✓	✓	✓
Tank connection[5] 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 Article No. and specify Order code.				
Sanitary process connection according DIN 11851 (Dairy connection with slotted union nut)				
• DN 50, PN 25	**N04**	✓	✓	✓
• DN 80, PN 25	**N06**	✓	✓	✓
Tri-Clamp connection according DIN 32676/ISO 2852 3A compliant[6]				
• DN 50/2", PN 16	**N14**	✓	✓	✓
• DN 65/2.5", PN 10	**N15**	✓	✓	✓
• Clamp 2" ISO 2852 PN 16	**N22**	✓	✓	✓
• Clamp 3" ISO 2852 PN 16	**N23**	✓	✓	✓
Varivent connection 3A and EHEDG compliant[6]				
• Type N = 68 for Varivent enclosure DN 40 ... 125 and 1½" ... 6", PN 40	**N28**	✓	✓	✓
Temperature decoupler up to 200 °C[7] for front-flush diaphragm version	**P00**	✓	✓	✓
Sanitary process connection to DRD				
• DN 50, PN 40	**M32**	✓	✓	✓
SMS threaded socket				
• 2"	**M73**	✓	✓	✓
• 2½"	**M74**	✓	✓	✓
• 3"	**M75**	✓	✓	✓
Sanitary process connection to NEUMO Bio-Connect screw connection 3A and EHEDG compliant[6]				
• 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 S flange connection				
• DN 2", PN 16	**Q72**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Article No. and specify Order code.				
Aseptic threaded socket to DIN 11864-1 Form A				
3A compliant[6]				
• 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				
3A compliant[6]				
• 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				
3A compliant[6]				
• 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				
3A compliant[6]				
• DN 50, PN 25	**N53**	✓	✓	✓
• DN 65, PN 25	**N54**	✓	✓	✓
• DN 80, PN 16	**N55**	✓	✓	✓
• DN 100, PN 16	**N56**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Additional data				
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.				
Measuring range to be set	**Y01**	✓	✓[8]	
Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi				
Stainless steel tag plate and entry in device variable (measuring point description)	**Y15**	✓	✓	✓
Max. 16 characters, specify in plain text: Y15:				
Measuring point text (entry in device variable)	**Y16**	✓	✓	✓
Max. 27 characters, specify in plain text: Y16:				
Entry of HART TAG	**Y17**	✓		
Max. 8 characters, specify in plain text: Y17:				
Setting of the display in pressure units	**Y21**	✓	✓	✓
Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected:				
bar, mbar, mm H_2O[*], inH_2O[*], ftH_2O[*], mmHG, inHG, psi, Pa, kPa, MPa, g/cm^2, kg/cm^2, Torr, ATM or % *) ref. temperature 20 °C				
Setting of the display in non-pressure units[9]	**Y22 + Y01**	✓		
Specify in plain text: Y22: ..... up to ..... l, m^3, m, USg, ... (specification of measuring range in pressure units "**Y01**" is essential, unit with max. 5 characters)				
Preset bus address (possible between 1 ... 126)	**Y25**		✓	✓
Specify in plain text: Y25:				

Factory mounting of valve manifolds, see accessories.

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

✓ = available

Ordering example

Item line:	7MF8023-1DB24-1AB7-Z
B line:	A02 + Y01 + Y21
C line:	Y01: 1 ... 10 bar (14.5 ... 145 psi)
C line:	Y21: bar (psi)

1) When also ordering the quality test 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.

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

3) Special seal in Viton included in the scope of delivery (FKM; temperature range -20 ... +200 °C (-4 ... +392 °F))

4) Cannot be combined with Order code P00. Can only be ordered with silicone oil measuring cell filling.

5) The weldable socket can be ordered under accessories.

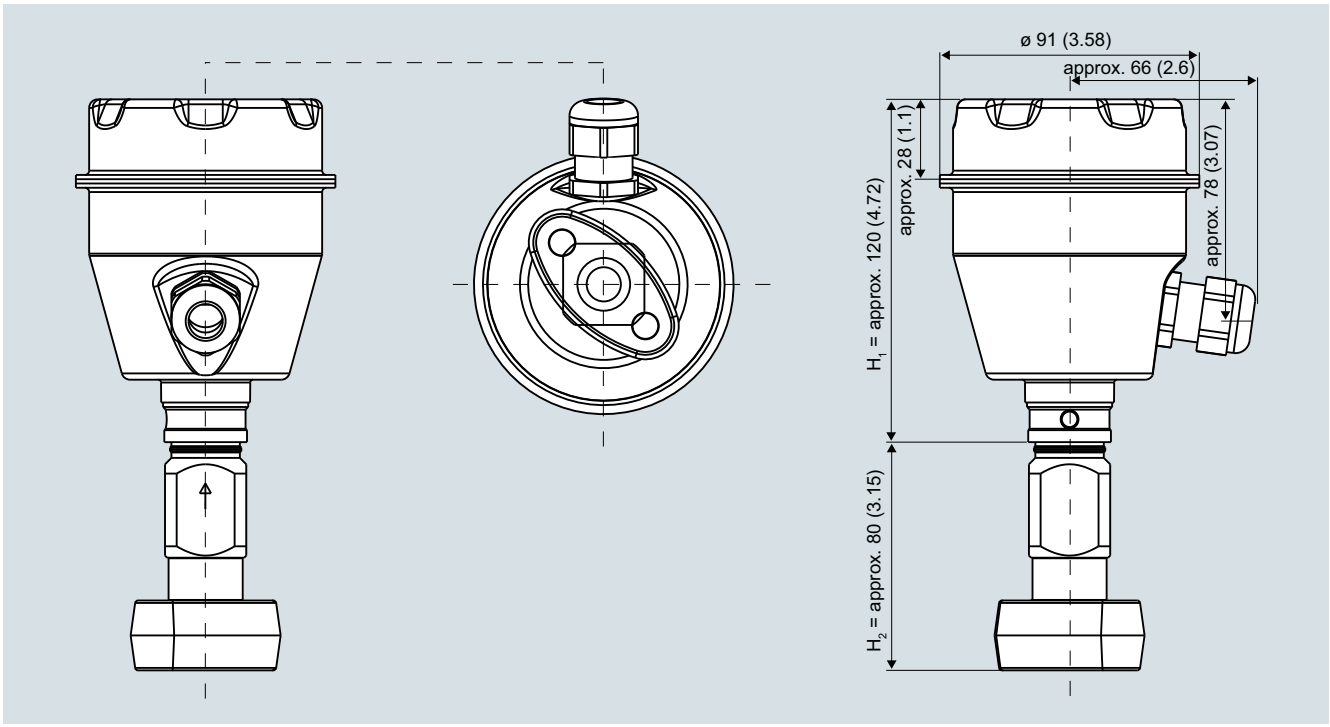
6) 3A compliance ensured only when 3A compliant sealing rings are used.

7) Conformity according to 3A and EHEDG. The maximum permissible temperatures of the medium depend on the respective cell fillings (see medium conditions).

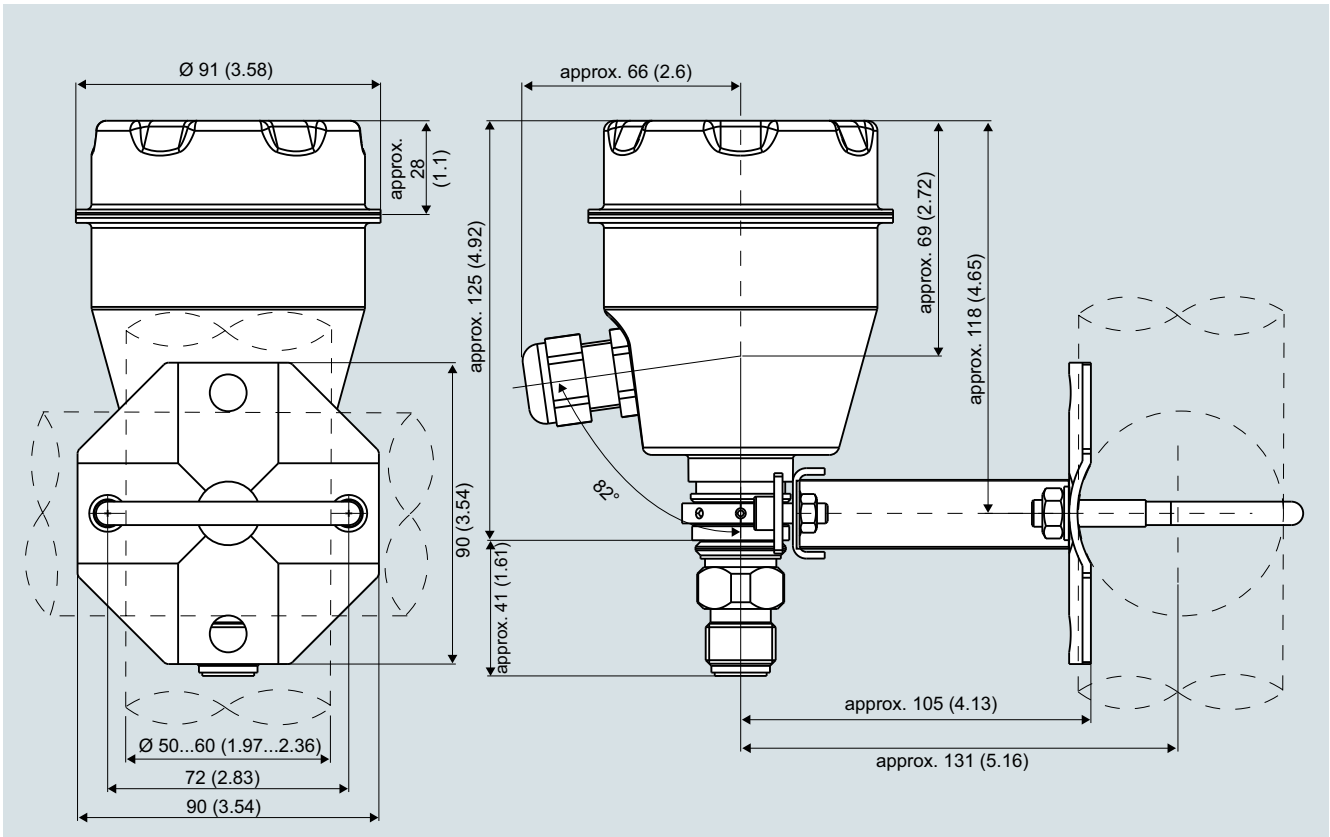
8) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

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

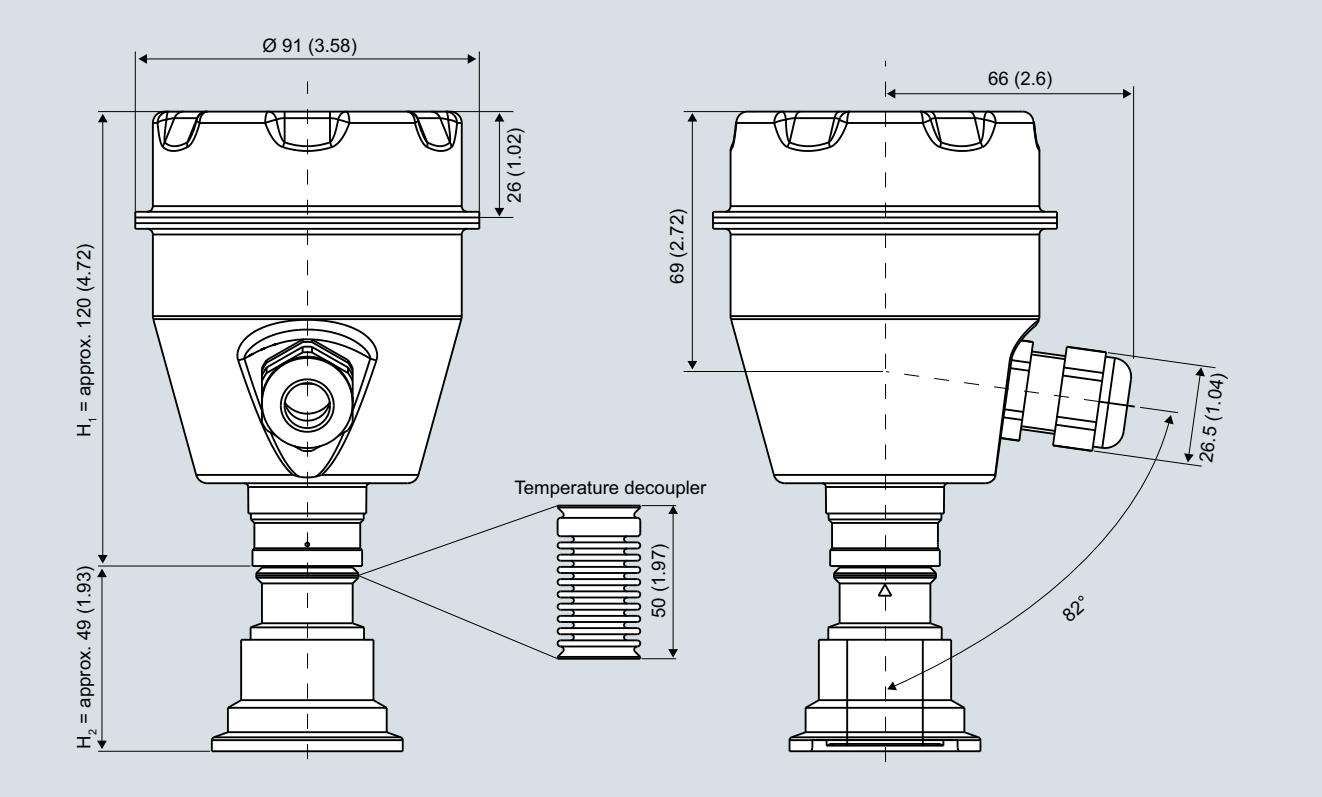
Dimensional drawings



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

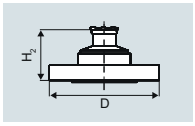
H_2 = Height of the flange up to this defined cross-section

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

Flanges according to EN and ASME

Flange according to EN

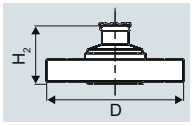
EN 1092-1



Order code	DN	PN	∅D	H_2
M11	25	40	115 mm (4.5")	Approx. 52 mm (2")
M13	40	40	150 mm (5.9")	
M23	40	100	170 mm (6.7")	
M04	50	16	165 mm (6.5")	
M14	50	40	165 mm (6.5")	
M06	80	16	200 mm (7.9")	
M16	80	40	200 mm (7.9")	

Flanges according to ASME

ASME B16.5

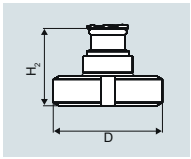


Order code	DN	PN	∅D	H_2
M40	1"	150	110 mm (4.3")	Approx. 52 mm (2")
M41	1½"	150	130 mm (5.1")	
M42	2"	150	150 mm (5.9")	
M43	3"	150	190 mm (7.5")	
M44	4"	150	230 mm (9.1")	
M46	1½"	300	155 mm (6.1")	
M47	2"	300	165 mm (6.5")	
M48	3"	300	210 mm (8.1")	
M49	4"	300	255 mm (10.0")	

NuG and pharmaceutical connections

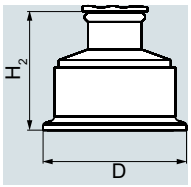
Connections to DIN

DIN 11851 (milk pipe union with slotted union nut)



Order code	DN	PN	∅D	H_2
N04	50	25	92 mm (3.6")	Approx. 52 mm (2")
N06	80	25	127 mm (5.0")	

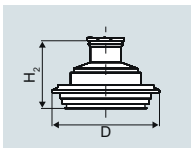
Tri-Clamp nach DIN 32676



Order code	DN	PN	∅D	H_2
N14	50	16	64 mm (2.5")	Approx. 52 mm (2")
N15	65	10	91 mm (3.6")	

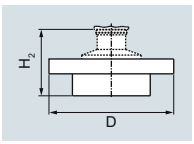
Other connections

Varivent connection



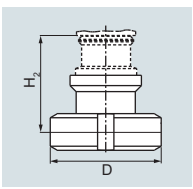
Order code	DN	PN	∅D	H_2
N28	40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

Sanitary process connection to DRD



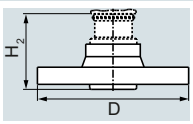
Order code	DN	PN	∅D	H_2
M32	50	40	105 mm (4.1")	Approx. 52 mm (2")

Sanitary process screw connection to NEUMO Bio-Connect



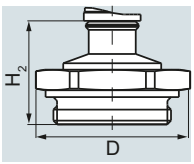
Order code	DN	PN	∅D	H_2
Q05	50	16	82 mm (3.2")	Approx. 52 mm (2")
Q06	65	16	105 mm (4.1")	
Q07	80	16	115 mm (4.5")	
Q08	100	16	145 mm (5.7")	
Q13	2"	16	82 mm (3.2")	
Q14	2½"	16	105 mm (4.1")	
Q15	3"	16	105 mm (4.1")	
Q16	4"	16	145 mm (5.7")	

Sanitary process connection to NEUMO Bio-Connect S flange connection



Order code	DN	PN	∅D	H_2
Q72	2"	16	125 mm (4.9")	Approx. 52 mm (2")

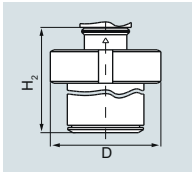
Threaded connection G¾", G1" and G2" acc. to DIN 3852



Order code	DN	PN	∅D	H_2
R01	¾"	60	37 mm (1.5")	Approx. 45 mm (1.8")
R02	1"	60	48 mm (1.9")	Approx. 47 mm (1.9")
R04	2"	60	78 mm (3.1")	Approx. 52 mm (2")

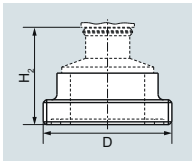
SITRANS P300 for gauge and absolute pressure

Tank connection TG 52/50 and TG52/150



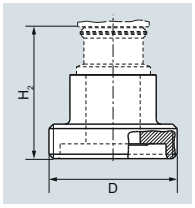
Order code	DN	PN	∅D	H_2
R10	25	40	63 mm (2.5")	Approx. 63 mm (2.5")
R11	25	40	63 mm (2.5")	Approx. 170 mm (6.7")

SMS threaded socket



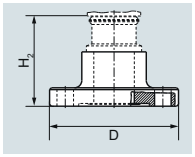
Order code	DN	PN	∅D	H_2
M73	2"	25	70 x 1/6 mm	Approx. 52 mm (2")
M74	2½"	25	85 x 1/6 mm	
M75	3"	25	98 x 1/6 mm	

Aseptic threaded socket to DIN 11864-1 Form A



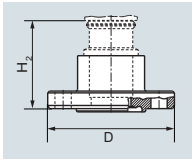
Order code	DN	PN	∅D	H_2
N33	50	25	78 x 1/6"	Approx. 52 mm (2")
N34	65	25	95 x 1/6"	
N35	80	25	110 x ¼"	
N36	100	25	130 x ¼"	

Aseptic flange with notch to DIN 11864-2 Form A



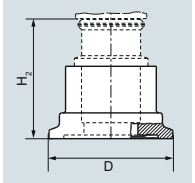
Order code	DN	PN	∅D	H_2
N43	50	16	94	Approx. 52 mm (2")
N44	65	16	113	
N45	80	16	133	
N46	100	16	159	

Aseptic flange with groove to DIN 11864-2 Form A



Order code	DN	PN	∅D	H_2
N43 + P11	50	16	94	Approx. 52 mm (2")
N44 + P11	65	16	113	
N45 + P11	80	16	133	
N46 + P11	100	16	159	

Aseptic clamp with groove to DIN 11864-3 Form A



Order code	DN	PN	∅D	H_2
N53	50	25	77.5	Approx. 52 mm (2")
N54	65	25	91	
N55	80	16	106	
N56	100	16	130	

Selection and Ordering data	Article No.
Spare parts / Accessories	
Mounting bracket and fastening parts kit made of stainless steel	**7MF8997-1AA**
Lid without window gasket not included	**7MF8997-1BA**
Lid with glass window gasket not included	**7MF8997-1BD**
NBR enclosure sealing	**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"	**7MF4997-2HC**
• Gasket made of Viton for PMC Style Minibolt: front-flush 1"	**7MF4997-2HD**
Weldable socket for TG 52/50 and TG 52/150 connection	
• TG 52/50 connection	**7MF4997-2HE**
• TG5 2/150 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 FKM (Viton); temperature range: -20 ... +200 °C (-4 ... +392 °F), 10 units	
• DN 25, PN 40 (M11)	**7MF4997-2HH**
• 1", class 150 (M40)	**7MF4997-2HK**

Selection and Ordering data	Article No.
Documentation	
The entire documentation is available for download free-of-charge in various languages at: http://www.siemens.com/processinstrumentation/documentation	
Compact operating instructions	
• English, German, Spanish, French, Italian, Dutch	**A5E03434657**
Certificates (order only via SAP) instead of Internet download	
• hard copy (to order)	**A5E03252406**
• on DVD (to order)	**A5E03252407**
HART modem	
with USB interface	**7MF4997-1DB**

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

SITRANS P300 - Factory-mounting of valve manifolds on transmitters

Overview

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

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

Design

The 7MF9011-4EA valve manifolds are sealed with PTFE gaskets between the transmitter and the valve manifold as standard. Soft iron, stainless steel and copper gaskets are also available for sealing purposes if preferred.

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

The complete unit is checked for leaks under pressure after assembly (air pressure 6 bar (87 psi)) and certified with a factory certificate according to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the corresponding 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 inspection certificate 3.1 to EN 10204 after choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitter and for the valve manifold.

Selection and Ordering data

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

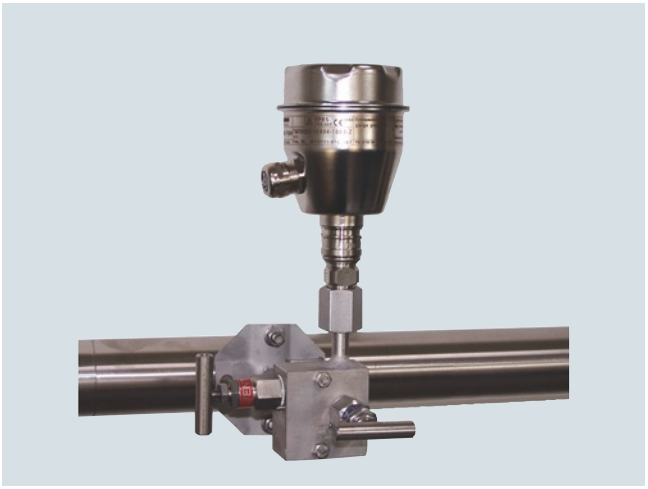
Add **-Z** to the Article No. of the transmitter and add Order codes	Order code
SITRANS P300 7MF802.-...1.-... With process connection female thread ½-14 NPT in-sealed with PTFE sealing tape Delivery including high-pressure test certified by factory certificate according to EN 10204-2.2	**T03**
Further designs:	
Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)	**A02**
Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	**C12**

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

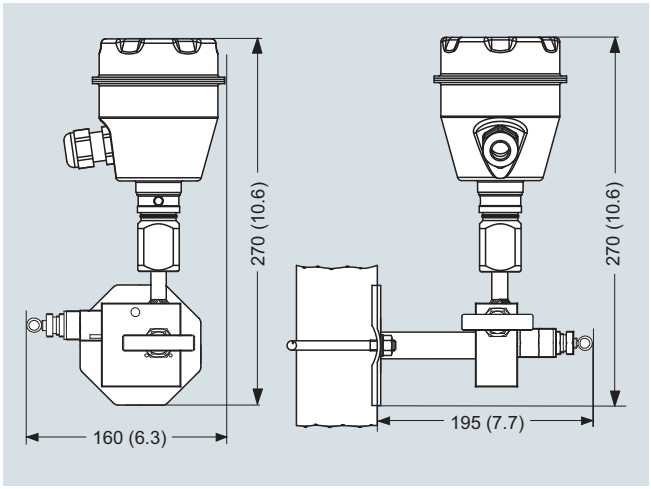
Add **-Z** to the Article No. of the transmitter and add Order codes	Order code
SITRANS P300 7MF802.-...0.-... with process connection collar G½ A to EN 837-1 with gasket made of PTFE between valve manifold and transmitter	**T02**
Alternative sealing material:	
• Soft iron	**A70**
• Stainless steel, Mat. No. 14571	**A71**
• copper	**A72**
Delivery including high-pressure test certified by factory certificate according 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**
Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	**C12**

Dimensional drawings

Valve manifolds mounted on SITRANS P300

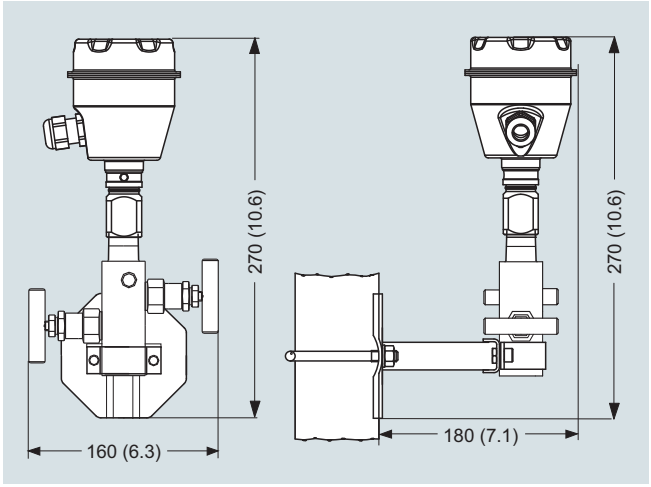


7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters



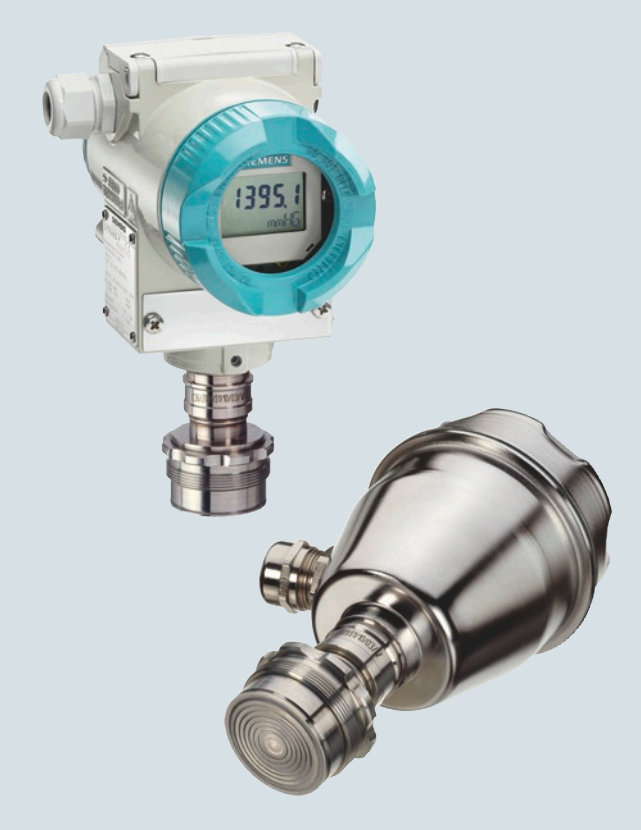
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)

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 measuring spans from 0.03 bar to 16 bar (0.43 psi to 232 psi) for DS III with HART interface
- Nominal measuring range from 1 bar to 16 bar (14.5 psi to 232 psi) for DS III with PROFIBUS PA and FOUNDATION Fieldbus interface
- Infinitely adjustable measuring spans from 0.03 bar to 16 bar (0.43 psi to 232 psi) for SITRANS P300 with HART interface
- Nominal measuring range from 1 bar to 16 bar (14.5 psi to 232 psi) 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 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.

Measuring span (infinitely adjustable)

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

Nominal measuring range

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

SITRANS P300

Measuring span (infinitely adjustable)

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

Nominal measuring range

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

Design

SITRANS P DS III

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 Article No. is located on the side of the enclosure. 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).

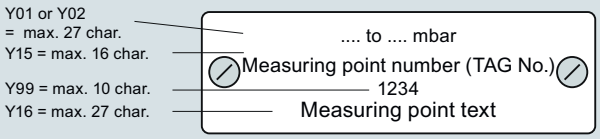
The approval label is located on the opposite side.

The enclosure is made of die-cast aluminium or stainless steel precision casting. A round cover is screwed on at the front and rear of the enclosure. The front cover (2) can be fitted with a viewing pane so that the measured values can be read directly on the display. The inlet (8) for the electrical connection is located either on the left or right side. The unused opening on the opposite side is sealed by a blanking plug. The protective earth connection is located on the rear of the enclosure.

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the enclosure 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 enclosure is a plastic cover (1), which hides the input keys.

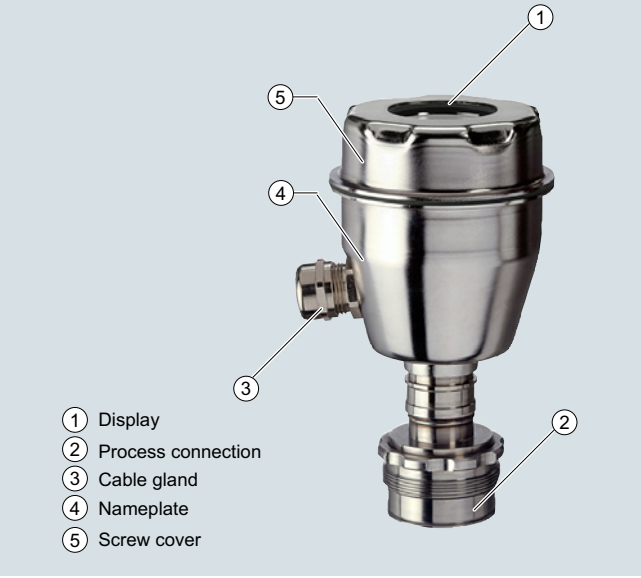
Example for an attached measuring point label



SITRANS P300

The device comprises:

- Electronics
- Enclosure
- Measuring cell

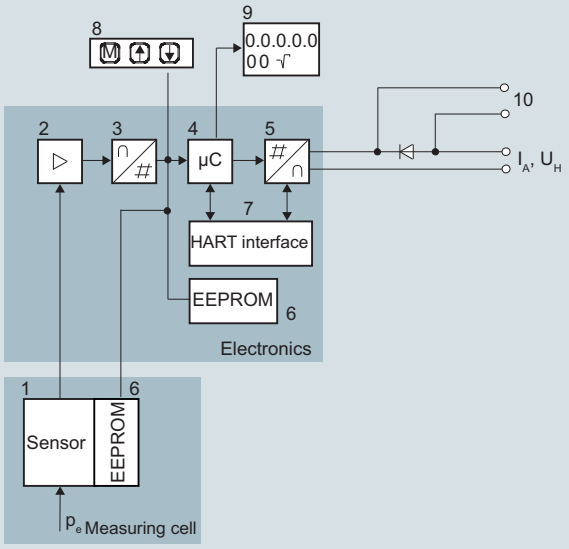


Perspective view of the SITRANS P300

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

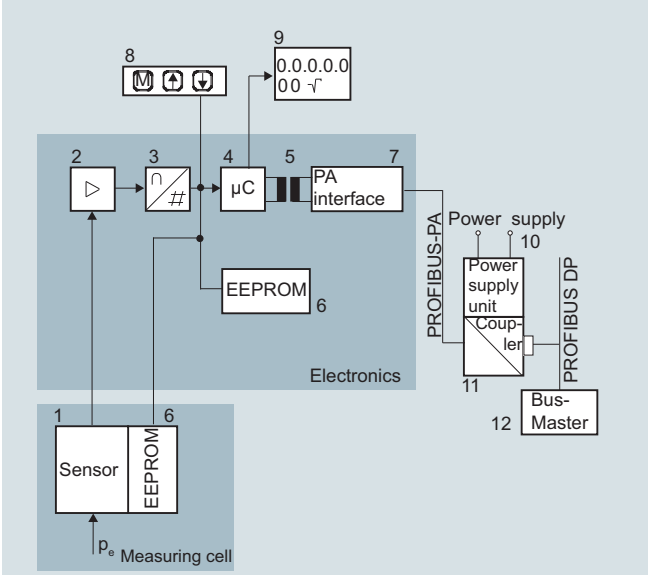
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced 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 display (9).

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

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

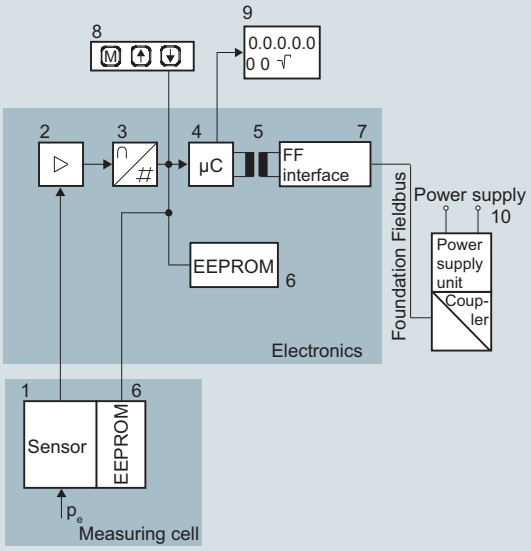
The bridge output voltage created by the sensor (1, Figure "Function diagram of electronics") is amplified by the measuring amplifier(2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected, 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 display (9).

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

Operation of electronics with FOUNDATION Fieldbus communication



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

Function diagram of electronics

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

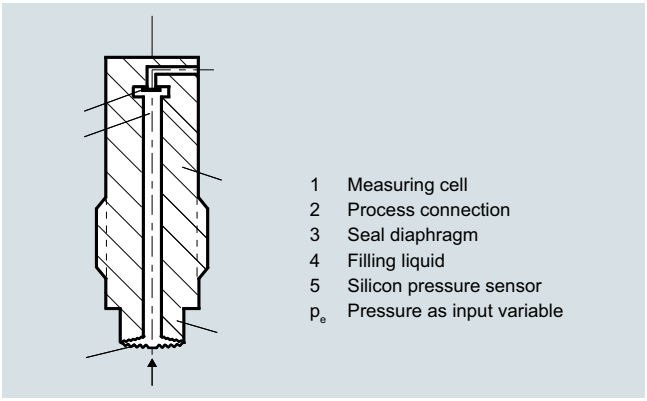
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

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

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

Mode of operation of the measuring 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

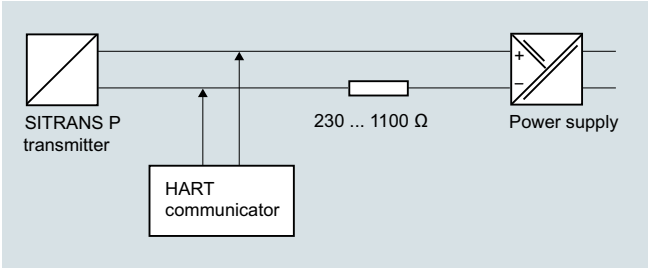
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

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

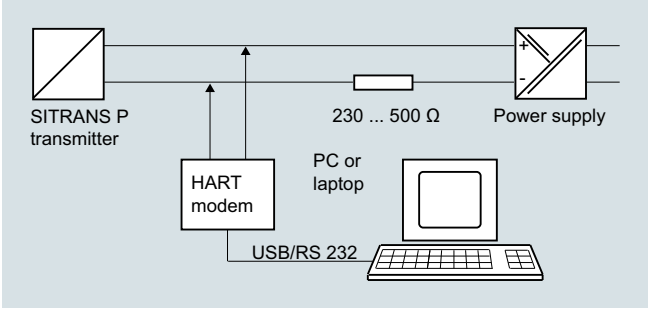
Parameterization using HART

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	Input keys	HART communication
Lower range value	x	x
Upper range value	x	x
Electrical damping	x	x
Lower range value without application of a pressure ("Blind setting")	x	x
Upper range value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x[1)]
Type of dimension and actual dimension	x	x
Characteristic (linear)	x	x
Input of characteristic		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 display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- Simulation functions
- Maintenance timer

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

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

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

Adjustable parameters for DS III with PROFIBUS PA and FOUNDATION Fieldbus, and P300 with PROFIBUS PA and FOUNDATION Fieldbus

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

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

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

Physical dimensions available for the display

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	MPa, 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	%

Technical specifications

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

Input				
Measured variable	Gauge pressure			
Measuring span (infinitely adjustable) or nominal measuring range, max. operating pressure and max. test pressure	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**		
	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 psi	10 bar 1 MPa 145 psi
	0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
Lower measuring limit (For PMC-Style Minibolt no measuring span < 500 mbar adjustable)	100 mbar a/10 kPa a/1.45 psi a			
Upper measuring limit	100% of max. measuring span			
Output	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**		
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal		
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-		
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-		
Load				
• Without HART 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.			
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)			
Measuring accuracy	Acc. to IEC 60770-1			
Reference conditions (All error data refer always refer to the set span)	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Silicone oil filling • Room temperature 25 °C (77 °F)			
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nom. pressure range			
Error in measurement at limit setting incl. hysteresis and reproducibility				
• Linear characteristic				
- r ≤ 5	≤ 0.075 %			
- 5 < r ≤ 100	≤ (0.005 · r + 0.05) %			
Influence of ambient temperature (in percent per 28 °C (50 °F))	≤ (0.08 · r + 0.16) %			
Long-term stability (temperature change ± 30 °C (± 54 °F))	≤ (0.25 · r) % in 5 years			
Effect of mounting position	≤ 0.1 mbar/0.01 kPa/0.00145 psi per 10° inclination (zero point correction is possible with position error compensation)			
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V			
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range			

SITRANS P DS III with PMC connection

SITRANS P, DS III series for gauge pressure with PMC connection for the paper industry		
	HART	**PROFIBUS PA and FOUNDATION Fieldbus**
Operating conditions		
Degree of protection		
• according to EN 60529	IP66 (optional IP66/IP68)	
• according to NEMA 250	Type 4X	
Temperature of medium	-40 ... +100 °C (-40 ... +212 °F)	
Ambient conditions		
• Ambient temperature	-20 ... +85 °C (-4 ... +185 °F)	
- Transmitter	-40 ... +85 °C (-40 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
• Electromagnetic Compatibility		
- Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21	
Design		
Weight (without options)	≈ 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		
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply	-	Supplied through bus
Separate supply voltage	-	Not necessary
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 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	

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

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

SITRANS P DS III with PMC connection

Selection and Ordering data		Article No.
SITRANS P pressure transmitters for gauge pressure, with PMC connection series DS III with HART		7MF4133-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Measuring cell-cleaning**	
Silicone oil	normal	1
Inert liquid	grease-free to cleanliness level 2	3
Measuring span (min. ... max.)		
0.01 ... 1 bar[1]	(0.15 ... 14.5 psi)[1]	B
0.04 ... 4 bar	(0.58 ... 58 psi)	C
0.1.6 ... 16 bar	(2.32 ... 232 psi)	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 measuring span: 500 mbar (7.25 psi) - version "B")		3
Non-wetted parts materials		
• Enclosure made of die-cast aluminium		0
• Enclosure stainless steel precision casting		3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
- "Explosion-proof (Ex d)" [2]		D
- „Ex nA/ic (Zone 2)"[3]		E
• FM + CSA intrinsic safe (is)[4]		F
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)"[3][4]		NC
Electrical connection / cable entry		
• Female thread M20 x 1.5		B
• Female thread ½-14 NPT		C
• Device plugs M12 (stainless steel)[5] [6]		F
Display		
• Without display		0
• Without visible display (display concealed, setting: mA)		1
• With visible display (setting: mA)		6
• With customer-specific display (setting as specified, Order code "Y21" required)		7

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

Included in delivery of the device:
- Quick-start guide
- Sealing ring

1) Only with "PMC Style Standard" process connection
2) Without cable gland, with blanking plug
3) Configurations with device plugs M12 are only available in Ex ic.
4) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
5) Only in connection with Ex approval A, B, E or F.
6) M12 delivered without cable socket

Selection and Ordering data		Article No.
SITRANS P pressure transmitter for gauge pressure, with PMC connection		
DS III with PROFIBUS PA (PA)		↗ 7MF4134-
DS III with FOUNDATION Fieldbus (FF)		↗ 7MF4135-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Meas. cell cleaning**	
Silicone oil	normal	1
Inert liquid	grease-free to cleanliness level 2	3
Nominal measuring range		
1 bar[1]	(14.5 psi)[1]	B
4 bar	(58 psi)	C
16 bar	(232 psi)	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 measuring span: 500 mbar (7.25 psi), not available with 1-bar-measuring cell (Option B))		3
Non-wetted parts materials		
• Enclosure made of die-cast aluminium		0
• Enclosure stainless steel precision casting		3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
- "Explosion-proof (Ex d)" [3]		D
- „Ex nA/ic (Zone 2)"[4]		E
• FM + CSA intrinsic safe (is)[5]		F
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)"[3][5]		NC
Electrical connection / cable entry		
• Female thread M20 x 1.5		B
• Female thread ½-14 NPT		C
• Device plugs M12 (stainless steel)[6] [7]		F
Display		
• Without display		0
• Without visible display (display concealed, setting: bar)		1
• With visible display (setting: bar)		6
• With customer-specific display (setting as specified, Order code "Y21" required)		7

Included in delivery of the device:
- Quick-start guide
- Sealing ring

1) Only with "PMC Style Standard"process connection
2) Sealing is included in delivery.
3) Without cable gland, with blanking plug
4) Configurations with device plugs M12 are only available in Ex ic.
5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505
6) Only in connection with Ex approval A, B, E or F.
7) M12 delivered without cable socket

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Article No. and specify Order code.				
Device plugs				
• Angled	**A32**	✓		
• Han 8D (metal, gray)	**A33**	✓		
M12 cable sockets (metal (CuZn))	**A50**	✓	✓	✓
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
• Cyrillic (russian)	**B16**	✓	✓	✓
English rating plate Pressure units in in$H_2$0 and/or psi	**B21**	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	**C14**	✓	✓	✓
"Functional safety (SIL2)" certificate acc. to IEC 61508	**C20**	✓		
"Functional safety (SIL2/3)" certificate acc. to IEC 61508	**C23**	✓		
PED for Russia with initial calibration mark	**C99**	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	✓	✓	✓
Degree of protection IP66/IP68 (only for M20 x 1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Export approval Korea	**E11**	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-.B..)	**E55**[1)]	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-.D..)	**E56**[1)]	✓	✓	✓
Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.E..)	**E57**[1)]	✓	✓	✓
Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.R..)	**E58**[1)]	✓	✓	✓
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**	✓	✓	✓

[1)] When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

Selection and Ordering data	Order code	HART	PA	FF
Additional data				
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.				
Measuring range to be set Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	**Y01**	✓	✓[1)]	
Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15:	**Y15**	✓	✓	✓
Measuring point text (entry in device variable) Max. 27 characters, specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART address (TAG) Max. 8 characters, specify in plain text: Y17:	**Y17**	✓		
Setting of pressure indication in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H_2O*), inH_2O*), ftH_2O*), mmHG, inHG, psi, Pa, kPa, MPa, g/cm², kg/cm², Torr, ATM or % *) ref. temperature 20 °C	**Y21**	✓	✓	✓
Setting of pressure indication in non-pressure units[2)] Specify in plain text: Y22: ..... up to ..... l, m³, m, USg, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	**Y22 + Y01**	✓		
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

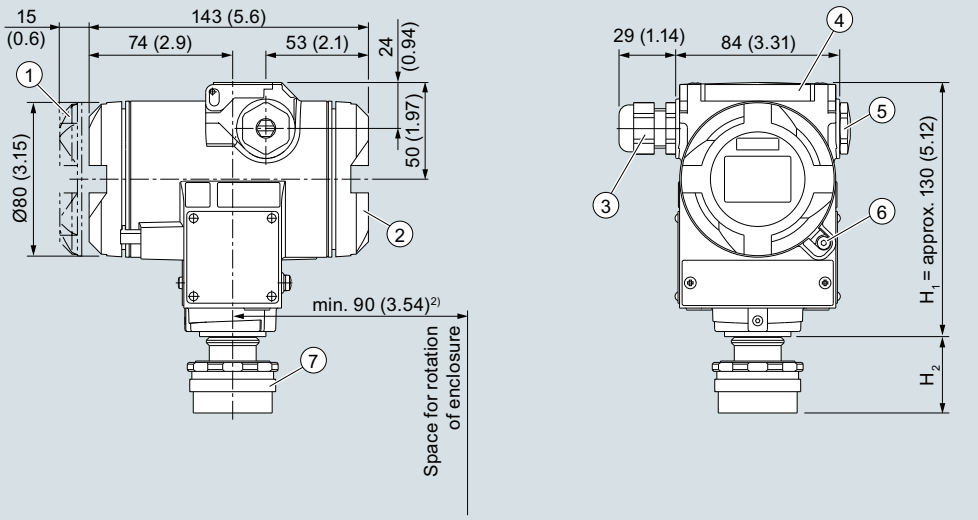
ordering example

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

[1)] Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

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

Dimensional drawings



1. Electronics side, local display (longer overall length for cover with inspection window)[1]
2. Connection side[1]
3. Electrical connection:
   - M20 x 1,5 screw gland
   - ½-14 NPT screw gland
   - M12 device plug
4. Cover over buttons
5. Blanking plug
6. Safety catch (only for "flameproof enclosure" type of protection; not shown in the drawing)
7. Process connection: PMC standard

[1] In addition, allow approx. 20 mm (0.79 inch) for the thread length
[2] 92 mm (3.62 inch) minimum distance for rotating with indicator

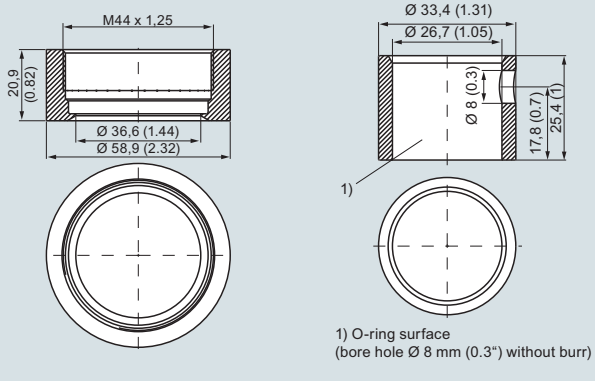
SITRANS P DS III pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

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

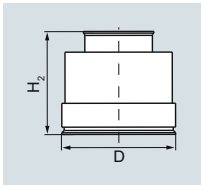
Only the height H_2 is indicated in the dimensions of the flanges.



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

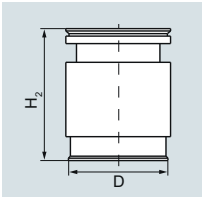
Material: Stainless steel, Mat. No. 1.4404/316L

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")

Technical specifications

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

Input				
Measured variable	Gauge pressure (front-flush)			
Measuring span (infinitely adjustable) or nominal measuring range and max. permissible test pressuree	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**		
	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 psi	10 bar 1 MPa 145 psi
	0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
Lower measuring limit (For PMC-Style Minibolt no measuring span < 500 mbar adjustable)	100 mbar a/10 kPa a/1.45 psi a			
Upper measuring limit	100 % of max. measuring span			

Output	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-
Load		
• Without HART 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.	
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)	

Measuring accuracy	Acc. to IEC 60770-1
Reference conditions	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Measuring cell with silicone oil • Room temperature 25 °C (77 °F)
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range
Error in measurement at limit setting incl. hysteresis and reproducibility	
Linear characteristic	
- r ≤ 5	≤ 0.075 %
- 5 < r ≤ 100	≤ (0.005 · r + 0.05) %
Influence of ambient temperature (in percent per 28 °C (50 °F))	≤ (0.08 · r + 0.16) %
Long-term stability (temperature change ± 30 °C (± 54 °F))	≤ (0.25 · r) % in 5 years
Effect of mounting position	≤ 0.1 mbar/0.01 kPa/0.00145 psi per 10° inclination (zero point correction is possible with position error compensation)
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range

SITRANS P300 with PMC connection

SITRANS P300 for gauge pressure with PMC connection for the paper industry		
Operating 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)	
• Display readable	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
Climatic class		
Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
Degree of protection		
• according to EN 60529	IP65, IP68	
• according to NEMA 250	Type 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F)	
Electromagnetic Compatibility		
• Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21	
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	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 42 V DC for intrinsically safe operation: 10.5 ... 30 V DC	
Power supply		Supplied through bus
Separate supply voltage	-	Not necessary
Bus voltage		
• Without Ex	-	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	-	Yes

SITRANS P300 for gauge pressure with PMC connection for the paper industry		
Certificates and approvals	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of Article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
Intrinsic safety "i"	PTB 05 ATEX 2048	
Marking	II 1/2 G Ex ia IIC/IIB T4/T5/T6 Ga/Gb	
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	$L_i \leq 7$ 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	

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	0 ... 100 s adjustable
- 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
- Specification of a container characteristic with	Max. 31 nodes
- 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		Article No.
SITRANS P300 pressure transmitters with PMC connection, single chamber enclosure, rating plate inscription in English		
with 4 ... 20 mA / HART ↗		**7MF8123-**
with PROFIBUS PA ↗		**7MF8124-**
with FOUNDATION Fieldbus (FF) ↗		**7MF8125-**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		■■■■■-■■■■
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	**1**
Inert liquid	Cleanliness level 2 to DIN 25410	**3**
Measuring span		
1 bar[1]	(14.5 psi)	**B**
4 bar	(58 psi)	**C**
16 bar	(232 psi)	**D**
Wetted parts materials		
Seal diaphragm	Measuring cell	
Hastelloy	Stainless steel	**B**
Process connection		
• PMC Style Standard: Thread 1½"		**2**
• PMC Style Minibolt: front-flush 1" (minimum measuring span: 500 mbar (7.25 psi), 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 (Ex ia)"		**B**
• Zone 20/21/22[2]		**C**
• Ex nA/nL (Zone 2)[3]		**E**
• With FM + CSA, Type of protection:		
- "Intrinsic Safe (is)" (planned)[4]		**M**
Electrical connection/cable entry		
• Screwed gland M20 x .5 (polyamide)[5]		**A**
• Screwed gland M20 x 1.5 (metal)		**B**
• Screwed gland M20 x 1.5 (stainless steel)		**C**
• Device plug M12 (stainless steel), without cable socket)		**G**
• ½-14 NPT metal thread[6]		**H**
• ½-14 NPT stainless steel thread[6]		**J**

Selection and Ordering data	Article No.
SITRANS P300 pressure transmitters with PMC connection, single chamber enclosure, rating plate inscription in English	
with 4 ... 20 mA / HART	**7MF8123-**
with PROFIBUS PA	**7MF8124-**
with FOUNDATION Fieldbus (FF)	**7MF8125-**
	■■■■■-■■■■
Display	
• Without display, with keys, closed lid	**1**
• With display and keys, closed lid [7]	**2**
• With display and keys, lid with polycarbonate disc (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units)[7]	**4**
• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc [7]	**5**
• With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure unit)[7]	**6**
• With display (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass panel[7]	**7**

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

Included in delivery of the device:
- Quick-start guide
- Sealing ring

1) Only with "Standard" process connection
2) Not in conjunction with electrical connection option A.
3) Only available together with electrical connection options B, C or G.
4) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
5) Only together with HART electronics.
6) Without cable gland.
7) Display cannot be turned.

SITRANS P300 with PMC connection

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Article No. and specify Order code.				
Cable socket for device plugs M12				
• Stainless steel	**A51**	✓	✓	✓
Rating plate inscription (instead of English)				
• German	**B10**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
English rating plate Pressure units in in$H_2$0 and/or psi	**B21**	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	**C14**	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	✓	✓	✓
Degree of protection IP65/IP68 (only for M20x1.5 and ½-14 NPT)	**D12**	✓	✓	✓
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 Article No. and specify Order code(s) and plain text.				
Measuring range to be set Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	**Y01**	✓	✓[1]	
Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15:	**Y15**	✓	✓	✓
Measuring point text (entry in device variable) Max. 27 char., specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART address (TAG) Max. 8 char., specify in plain text: Y17:	**Y17**	✓		
Setting of pressure indication in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm $H_2O^{*)}$, in$H_2O^{*)}$, ft$H_2O^{*)}$, mmHG, inHG, psi, Pa, kPa, MPa, g/cm², kg/cm², Torr, ATM or % *) ref. temperature 20 °C	**Y21**	✓	✓	✓
Setting of pressure indication in non-pressure units[2] Specify in plain text: Y22: ..... up to ..... l, m³, m, USg, ... (specification of measuring range in pressure units "**Y01**" is essential, unit with max. 5 characters)	**Y22 + Y01**	✓		
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	**Y25**		✓	✓

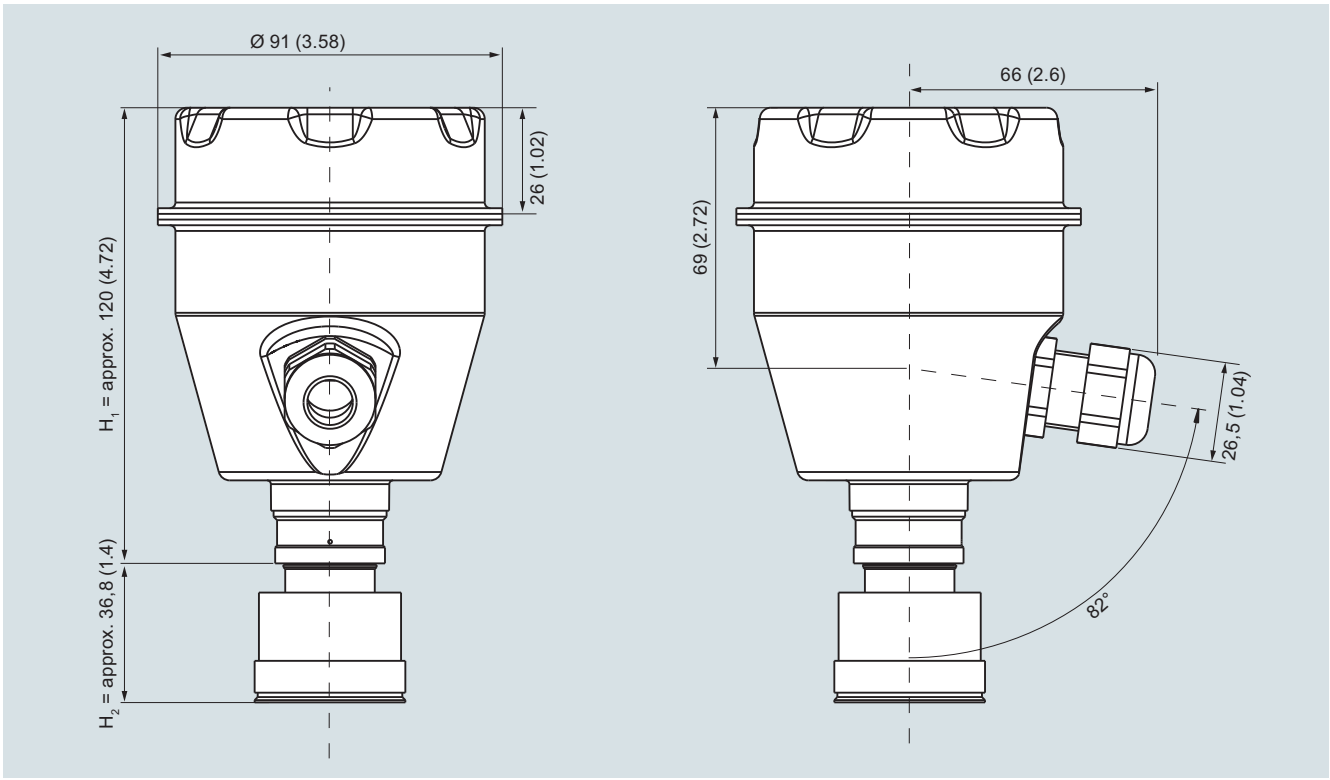
Only "Y01" and "Y21" can be factory preset

✓ = available

[1] Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

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

Dimensional drawings



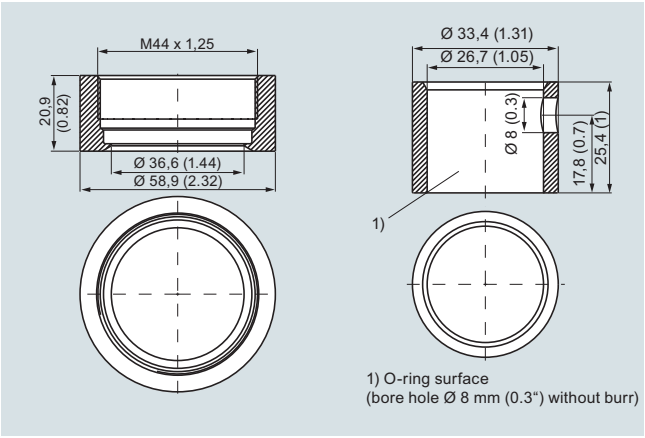
SITRANS P300 pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

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

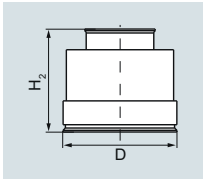
Only the height H_2 is indicated in the dimensions of the flanges.



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

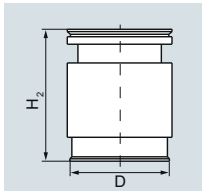
Material: Stainless steel, mat. No. 1.4404 / 316L

PMC Style Standard



DN	PN	ØD	H_2
		40.4 mm (1.6")	Approx. 36.8 mm (1.4")

PMC Style Mini bolt



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

Overview

SITRANS P320/P420 pressure transmitters are digital pressure transmitters featuring extensive user-friendliness and high accuracy. The parameter assignment is performed using input buttons or the HART interface.

The comprehensive functionality makes for precise adjustment of the pressure transmitter to the requirements of the plant. Operation is very user-friendly in spite of the numerous setting options.

Due to their advanced diagnostic functionalities according to NAMUR NE107, the SITRANS P320/P420 pressure transmitters are very suitable for use in chemical plants. Thanks to the advanced diagnostic functions and the process value storage, the SITRANS P420 is "Ready for Digitalization".

The "Remote Safety Handling" function saves customers significant amounts of time and money, because the SIL function can be switched on and validated remotely via SIMATIC PDM. This eliminates travel times and on-site operation via the local display or keyboard.

Parameter assignment using the HART protocol is very easy and quick thanks to the innovative EDD with integrated Quick Start wizard.

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

SITRANS P320/P420 pressure transmitters are available in various versions for measuring:

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

Benefits

- Diagnostic functions in accordance with NAMUR recommendation NE107
- SIL devices developed according to IEC 61508
- SIL validation on the device or remotely with SIMATIC PDM
- Reduction of internal inductance for Ex applications to LI = 0
- Step response time for pressure type T63 = 105 ms and for differential pressure type 135 ms.
- Minimal conformity error
- Very low temperature influence
- Very good long-term stability
- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- For corrosive and non-corrosive gases, vapors and liquids
- Extensive diagnostics and simulation functions
- Separate replacement of measuring cell and electronics without recalibration
- Wetted parts made of high-grade materials (e.g., stainless steel, alloy, gold, Monel, tantalum)
- Infinitely adjustable measuring spans from 0.01 bar to 700 bar (0.15 psi to 10153 psi)
- Convenient parameterization over 4 input buttons and HART interface

Application

SITRANS P320/P420 pressure transmitters can be used in industrial areas with extreme chemical and mechanical loads.

The pressure transmitters can be used in zone 1 or zone 0 with the corresponding Ex approval.

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 4 input buttons or programmed externally over HART interface.

Pressure transmitter for gauge pressure

Measured variable:

- Gauge pressure of corrosive and non-corrosive gases, vapors and liquids.

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 0.01 bar to 700 bar (0.15 psi to 10153 psi)

There are two series:

- Gauge pressure series
- Differential pressure series

Pressure transmitters for absolute pressure

Measured variable:

- Absolute pressure of corrosive and non-corrosive gases, vapors and liquids.

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 8.3 mbar a to 100 bar a (0.12 to 1450 psi 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 overpressure
- Flow q ~ √Δp (together with a primary differential pressure transducer (see section "Flow meters"))

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 1 mbar to 30 bar (0.0145 to 435 psi)

Pressure transmitters for level

Measured variable:

- Level of corrosive and non-corrosive liquids in open and closed vessels.

Measuring span (infinitely adjustable)

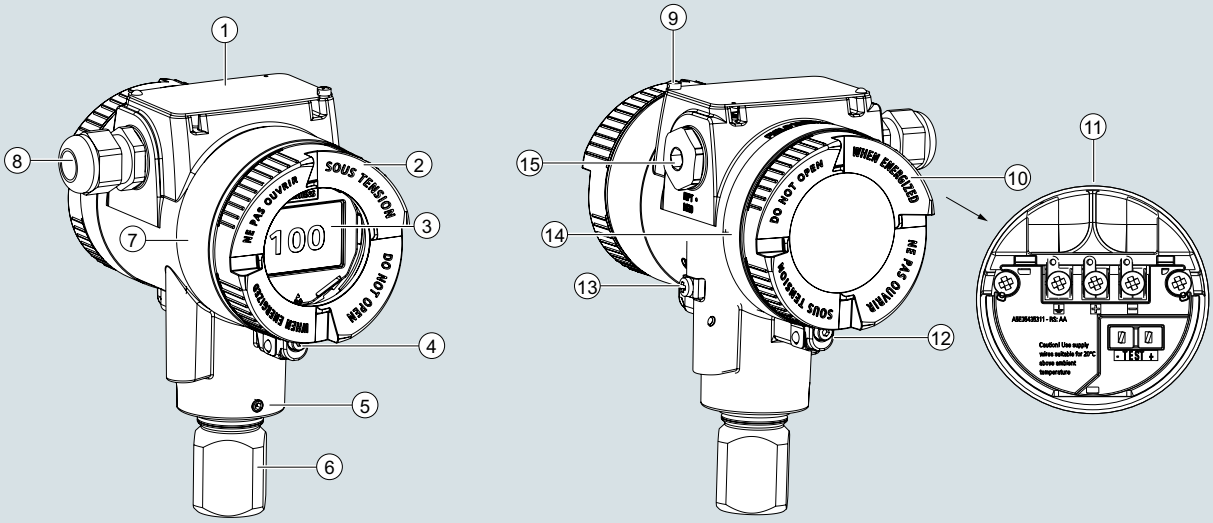
- For SITRANS P320/P420 with HART: 25 mbar to 5 bar (0.363 to 72.5 psi)

Type of the mounting flange:

- EN 1092-1 flanges
- ASME B16.5 flanges
- J.I.S. flanges
- Diverse range of sealing surface forms available

Design

Depending on the customer-specific order, the device comprises different parts.



1. Cover over buttons and nameplate with general information
2. Cover (front) with glass pane (optional)
3. Display (optional)
4. Safety catch (front)
5. Locking screw for locking the enclosure
6. Process connection
7. Approval label with approval information
8. Cable inlet, optionally with cable gland
9. Locking screw for the cover over the buttons
10. Cover (rear) for electrical terminal compartment
11. Electrical terminal compartment
12. Safety catch (back)
13. Ground terminal
14. Nameplate with information on the remote seal
15. Blanking plug

Device front view

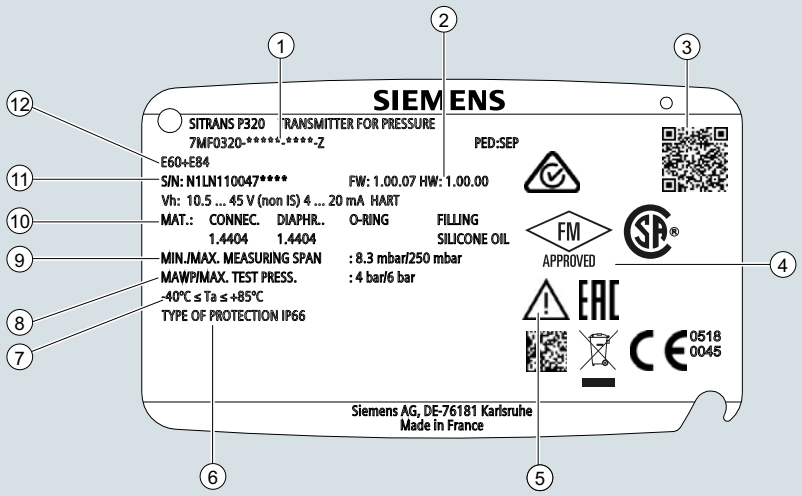
- The electronics enclosure is made of die cast aluminum or precision cast stainless steel.
- The enclosure has a removable circular cover at the front and the back.
- Depending on the device version, the front cover (2) may be designed as an inspection window.
- The cable inlet (8) to the electrical terminal compartment is at the side; either the left or right-hand one can be used. The unused opening is closed with a blanking plug (15).
- The ground terminal (13) is located on the side.
- The electrical terminal compartment (11) for the auxiliary power and shield is accessible when you remove the back cover (10).
- The measuring cell with process connection (6) is located in the bottom part of the enclosure.
  The measuring cell is prevented from rotating by a locking screw (5).
- Thanks to the modular design of the pressure transmitter, the measuring cell and application electronics or terminal compartment can be replaced if required.
- The cover over buttons (1), under which there are 4 buttons, is located on the upper face of the enclosure. The nameplate with general information is located on the cover over the buttons.

Technical description

Nameplates

Nameplate

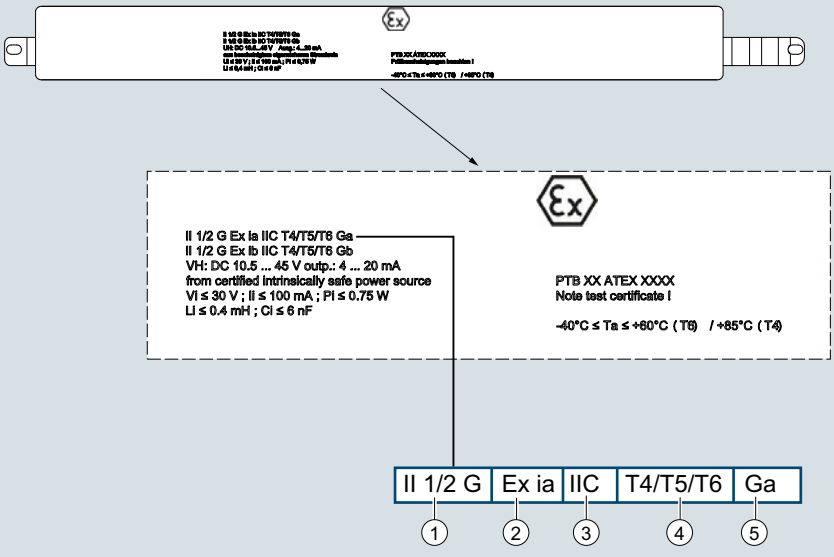
The nameplate with the article no. and other important information, such as design details and technical data, is located on the cover over the buttons.



1. Article number
2. Firmware and hardware identification
3. QR code to the mobile website with device-specific information
4. Conformity with country-specific directives
5. Note operating instructions, certificates and approvals
6. Protection class
7. Permitted ambient temperature for the hazardous area of the corresponding temperature class
8. Maximum allowable operating pressure / maximum allowable test pressure
9. Minimum/maximum measuring span
10. Material: connection, diaphragm, O-ring, oil
11. Serial number
12. Order supplement (options, order code)

Approval label with approval information

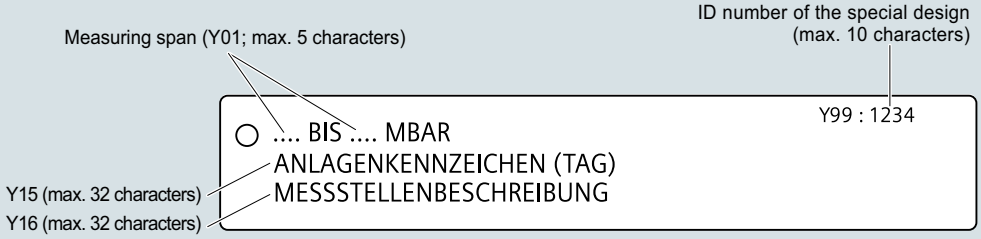
The approval label with approval information is located on the front of the enclosure.



1. Characteristics of the hazardous area
2. Type of protection
3. Group (gas, dust)
4. Maximum surface temperature (temperature class)
5. Device protection level

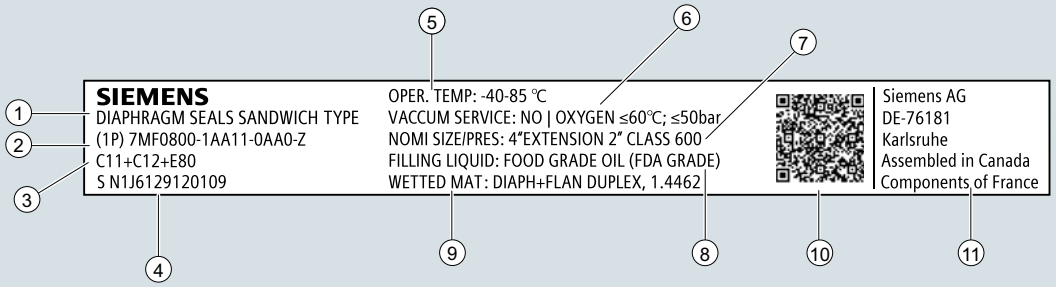
Measuring point label

The measuring point label is located under the front cover.



Nameplate with information on the remote seals

The nameplate with information on the remote seals is located on the back of the enclosure.



1. Diaphragm seals of sandwich type
2. Article number
3. Order supplement (options, order code)
4. Serial number
5. Operating temperature
6. Vacuum pressure service: No, oxygen ≤ 60 °C; ≤ 50 bar
7. Nominal diameter/pressure: 4 inch, 50 mm tube length, CLASS 600
8. Filling liquid: Food grade oil (FDA-compliant)
9. Wetted materials: Diaphragm duplex, 1.4462
10. QR code to mobile website with device-specific information
11. Assembly and manufacturing location

Function

Adjustable parameters and diagnostics

SITRANS P320/P420 with HART communication

Parameters	Input buttons	SITRANS P320	SITRANS P420
Application, measurement type	x	x	x
Lower range value/ upper range value	x	x	x
Lower range value/ upper range value	x	x	x
Electrical damping	x	x	x
Zero adjustment	x	x	x
Fault current	x	x	x
Saturation limits	x	x	x
Scaling of the display	x	x	x
Characteristic selection	x	x	x
Temperature unit	x	x	x
Key lock	x	x	x
Change user pin	x	x	x
Functional safety	x	x	x
Loop test	x	x	x
Start view	x	x	x
Pressure reference	x	x	x
Reset	x	x	x
Diagnostics and trend log			
Min/Max pointer		x	x
Limit monitoring		2	2
Event counter (overflow/underflow)		2	2
Trend log			2, max. 1 500 values
Diagnostic log		x	x
Parameters change log			x

Available physical units of display for SITRANS P320/P420

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4 °C), ftH_2O, mmH_2O, mmH_2O (4 °C), mH_2O (4 °C), mmHg, inHg, atm, torr
Level (height data)	m, cm, mm, ft, in
Volumes (fill level)	m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl
Volume (flow)	m^3/sec, m^3/h, m^3/d, l/sec, l/min, l/h, Ml/d, ft^3/sec, ft^3/h, ft^3/d, SCF/min, SCF/h, Nl/h, Nm^3/hgal/sec, gal/min, gal/h, gal/d, Mgal/d, gal (UK))/sec, gal (UK)/min, gal (UK)/h, gal (UK)/d, bbl/sec, bbl/min, bbl/h, bbl/d,
Mass (flow)	Kg/sec, kg/min, kg/h, kg/d, g/sec, g/min, g/h, t/min, t/h, t/d, lb/sec, lb/min, lb/h, lb/d, ton/min, ton/h, ton/d, ton (UK)/h, ton (UK)/d
Temperature	°C, °F
Miscellaneous	%, mA, free text max. 12 characters

For more device information and technical specifications, refer to the individual device versions.

Technical specifications

SITRANS P320 / SITRANS P420 for gauge pressure (pressure series)

Input			
Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086) (for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar	4 bar	6 bar
	0.83 ... 25 kPa	0.4 MPa	0.6 MPa
	0.12 … 3.6 psi	58 psi	87 psi
	0.01 ... 1 bar	6 bar	9 bar
	1 ... 100 kPa	0.6 MPa	0.9 MPa
	0.15 … 14.5 psi	87 psi	130 psi
	0.04 ... 4 bar	20 bar	30 bar
	4 ... 400 kPa	2 MPa	3 MPa
	0.58 … 58 psi	290 psi	435 psi
	0.16 ... 16 bar	45 bar	70 bar
	0.016 ... 1.6 MPa	4.5 MPa	7 MPa
	2.3 … 232 psi	652 psi	1015 psi
	0.63 ... 63 bar	80 bar	120 bar
	0.063 ... 6.3 MPa	8 MPa	12 MPa
	9.1 … 914 psi	1160 psi	1740 psi
	1.6 ... 160 bar	240 bar	360 bar
	0.16 ... 16 MPa	24 MPa	36 MPa
	23 … 2321 psi	3481 psi	5221 psi
	4 ... 400 bar	400 bar	600 bar
	0.4 ... 40 MPa	40 MPa	60 MPa
	58 … 5802 psi	5802 psi	8702 psi
	7 ... 700 bar	800 bar	800 bar
	0.7 ... 70 MPa	80 MPa	80 MPa
	102 … 10153 psi	11603 psi	11603 psi
Measuring limits			
• Low measuring limit	For 250 mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.		
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert oil	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with FDA-compliant oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Low saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• High saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 … 100 s, continuously adjustable over remote operation		
	0 … 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 … 22.8 mA		
• Failure signal	3.55 … 22.8 mA (factory preset to 3.55 mA)		
Load	Resistor R [Ω]		
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V		
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld))		
	R = 230 … 500 Ω (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		

for gauge pressure (pressure series)

SITRANS P320 / SITRANS P420 for gauge pressure (pressure series)		
Measuring accuracy		
Reference conditions	• According to EN 60770-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)	
Conformity error at limit point setting, including hysteresis and repeatability		
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span and nominal measuring range	
• Linear characteristic		
- 250 mbar/25 kPa/3.6 psi	r ≤ 1.25:	≤ 0.075% (SITRANS P320) ≤ 0.065% (SITRANS P420)
	1.25 < r ≤ 30:	≤ (0.008 · r + 0.055)%
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi	r ≤ 5:	≤ 0.065% (SITRANS P320) ≤ 0.04% (SITRANS P420)
	5 < r ≤ 100:	≤ (0.004 · r + 0.045)%
- 400 bar/40 MPa/5802 psi 700 bar/70 MPa/10152 psi	r ≤ 3: 3 < r ≤ 100:	≤ 0.075% (SITRANS P320) ≤ (0.005 · r + 0.05)% (SITRANS P320)
	r ≤ 5: 5 < r ≤ 100:	≤ 0.075% (SITRANS P420) ≤ (0.005 · r + 0.05)% (SITRANS P420)
Influence of ambient temperature in % per 28 °C (50 °F)		
• 250 mbar/25 kPa/3.6 psi	≤ (0.16 · r + 0.1)%	
• 1 bar/100 kPa/14.5 psi	≤ (0.05 · r + 0.1)%	
• 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	≤ (0.025 · r + 0.125)%	
• 700 bar/70 MPa/10152 psi	≤ (0.08 · r + 0.16)%	
Long-term stability at ±30 °C (±54 °F)		
• 250 mbar/25 kPa/3.6 psi	≤ (0.25 · r)% per year	
• 1 bar/100 kPa/14.5 psi	In 5 years ≤ (0.25 · r)% In 10 years ≤ (0.35 · r)%	
• 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	In 5 years ≤ (0.125 · r)% In 10 years ≤ (0.15 · r)%	
• 700 bar/70 MPa/10152 psi	In 5 years ≤ (0.25 · r)% In 10 years ≤ (0.35 · r)%	
Step response time T_{63} (without electrical damping)	≤ 0.105 s	
Effect of mounting position (in pressure per change of angle)	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° incline (zero point correction is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	

SITRANS P320 / SITRANS P420 for gauge pressure (pressure series)	
Operating conditions	
Temperature of medium	
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)
• Measuring cell with inert oil	
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	-40 ... +100 °C (-40 ... +212 °F)
- 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi 700 bar/70 MPa/10152 psi	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with FDA-compliant oil	-10 ... +100 °C (14 ... +212 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in areas subject to explosion hazard.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil for gauge pressure measuring cells: 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil	-40 … +85 °C (-40 … +185 °F)
- Measuring cell with FDA-compliant oil	-10 ... +85°C (14 ... +185°F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Design	
Weight	Approx. 2.3 kg (5.07 lb) with aluminum enclosure Approx. 4.2 kg (9.25 lb) for stainless steel enclosure
Material	
• Wetted parts materials	
- Process connection	Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602
- Oval flange	Stainless steel, mat. no. 1.4404/316L
- Seal diaphragm	Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel type plate (1.4404/316L)
- Mounting bracket	Electrogalvanized steel or stainless steel
Process connection	• Connection shank G1/2A according to DIN EN 837-1 • Female thread ½-14 NPT • Male thread M20 x 1.5 and ½-14 NPT • Oval flange (PN 160 (MWP 2320 psi g)) with fastening screw thread: - 7/16-20 UNF according to EN 61518 - M10 according to DIN 19213 • Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread: - 7/16-20 UNF according to EN 61518 - M12 according to DIN 19213 • Male thread M20 x 1.5 and ½-14 NPT
Electrical connection	Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Keys	4 keys for operation directly on the device
Display	• With or without integrated display (optional) • Cover with inspection window (optional)

SITRANS P320 / SITRANS P420 for gauge pressure (pressure series)	
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode
Ripple	U_{SS} ≤ 0.2 V (47 … 125 Hz)
Noise	U_{eff} ≤ 1.2 mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with the peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF

SITRANS P320 / SITRANS P420 for gauge pressure (pressure series)	
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 to 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	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
• Explosion protection according to CSA	Available soon
- Marking (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
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

[1] Han 8D is identical to Han 8U.

HART communication	
HART	230 ... 1100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

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for gauge pressure (pressure series)

Selection and ordering data

	Article No.
Pressure transmitters for gauge pressure (pressure series)	
SITRANS P320 ↗	**7MF030 - ■■■■■ - ■■■■**
SITRANS P420 ↗	**7MF040 - ■■■■■ - ■■■■**
↗ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
Measuring cell filling	
Silicone oil	**1**
Inert liquid	**3**
Neobee oil	**4**
Maximum measuring span	
250 mbar (3.6 psi)	**F**
1000 mbar (14.5 psi)	**J**
4000 mbar (58 psi)	**N**
16 bar (232 psi)	**Q**
63 bar (914 psi)	**T**
160 bar (2321 psi)	**V**
400 bar (5802 psi)	**W**
700 bar (10153 psi)	**X**
Process connection	
Male thread M20 x 1.5	**B**
Male thread G½ (DIN EN 837-1)	**D**
Female thread ½-14 NPT	**E**
Male thread ½-14 NPT	**F**
Oval flange, mounting thread: $^{7}/_{16}$-20 UNF (IEC 61518)	**G**
Oval flange, mounting thread: M10 (DIN 19213)	**H**
Oval flange, mounting thread: M12 (DIN 19213)	**J**
Version for diaphragm seal pressure	**U**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819	**1**
Alloy C22/2.4602, alloy C276/2.4819	**2**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class DCable gland must be ordered separately as option (Axx)ivision)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx) • 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (cover closed)	**0**
With display (cover closed)	**1**
With display (cover with glass pane)	**2**

Selection and ordering data

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/connector mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/connector mounted left	**A97**
Cable gland/connector mounted on right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009))	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	**D20**
FVMQ enclosure sealing	**D21**
IP66/IP68 degree of protection (not for device plugs M12 and Han)	**D30**
TAG label empty	**D40**
Without labeling of the measuring range on the TAG label	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (external)	**D71**
Adhesive labels on transport packaging (supplied by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Export approval CPA (China)	**E12**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)	**E21**
FM (USA and Canada)	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual seal	**E81**
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**

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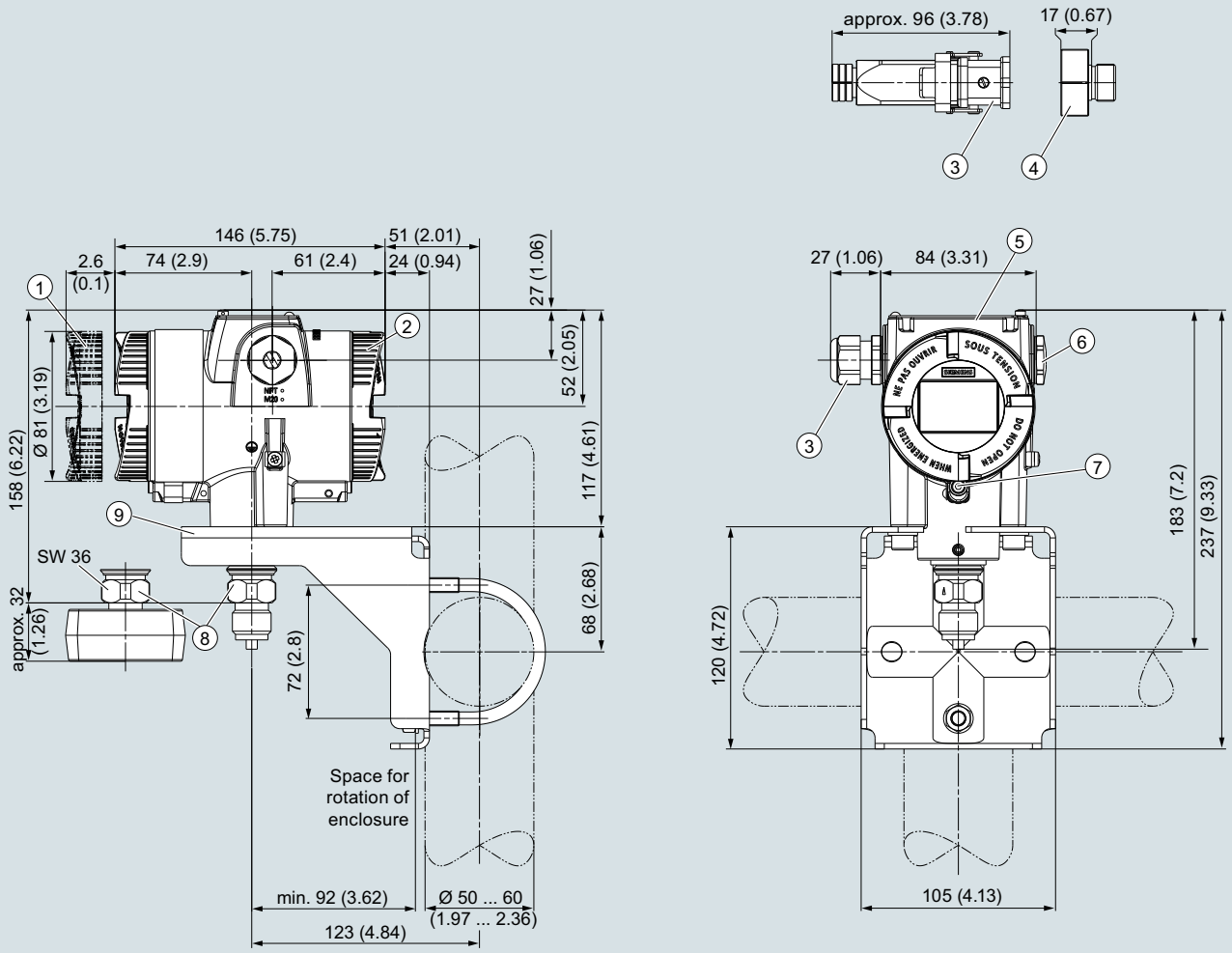
for gauge pressure (pressure series)

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Mounting bracket	
Steel, galvanized	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Flange connections with flange EN 1092-1	
With flange adapter G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J80**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J81**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J82**
With siphon G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J83**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J84**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J85**
• DN 25 PN 100, stainless steel 1.4571/316Ti	**J86**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
Seal (EN 837-1) material Fe (soft iron)	**K60**
Seal (EN 837-1) material 1.4571	**K61**
Seal (EN 837-1) material Cu	**K62**
Process connection	
Process connection male thread G½, bore hole 11 mm	**K80**
Shut-off valves, valve manifolds	
With mounted valve manifold 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in in factory certificate (EN 10204-2.2)	**T02**
With mounted valve manifold 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	**T03**
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	**T05**
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	**T06**

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, inHg, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special version Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

Dimensional drawings



1. Electronics side, local display (longer overall length for cover with glass pane)[1)]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3)] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2) 3)] device plug
   - M12 device plug[2) 3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection)
8. Process connection: G½B connection pin or oval flange
9. Mounting bracket (optional)

1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for gauge pressure (pressure series), dimensions in mm (inch)

Technical specifications

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)

Input			
Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	1 ... 20 mbar	160 bar	240 bar
	0.1 ... 2 kPa	16 MPa	24 MPa
	0.4019 … 8.037 inH_2O	2320 psi	3481 psi
	1 ... 60 mbar	160 bar	240 bar
	0.1 ... 6 kPa	16 MPa	24 MPa
	0.4019 … 24.11 inH_2O	2320 psi	3481 psi
	2.5 ... 250 mbar	160 bar	240 bar
	0.2 ... 25 kPa	16 MPa	24 MPa
	1.005 … 100.5 inH_2O	2320 psi	3481 psi
	6 ... 600 mbar	160 bar	240 bar
	0.6 ... 60 kPa	16 MPa	24 MPa
	2.41 … 241.1 inH_2O	2320 psi	3481 psi
	16 ... 1600 mbar	160 bar	240 bar
	1.6 ... 160 kPa	16 MPa	24 MPa
	6.43 … 643 inH_2O	2320 psi	3481 psi
	50 ... 5000 mbar	160 bar	240 bar
	5 ... 500 kPa	16 MPa	24 MPa
	20.09 … 2009 inH_2O	2320 psi	3481 psi
	0.3 ... 30 bar	160 bar	240 bar
	0.03 ... 3 MPa	16 MPa	24 MPa
	4.35 … 435 psi	2320 psi	3481 psi
	5 ... 100 bar	160 bar	240 bar
	0.5 ... 10 MPa	16 MPa	24 MPa
	76.9 … 1450 psi	2320 psi	3481 psi
Measuring limits			
• Low measuring limit			
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert oil	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with FDA-compliant oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Low saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• High saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 … 100 s, continuously adjustable over remote operation		
	0 … 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 … 22.8 mA		
• Failure signal	3.55 … 22.8 mA		
Load	Resistor R [Ω]		
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V		
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld))		
	R = 230 … 500 Ω (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)	
Measuring accuracy	
Reference conditions	• According to EN 60770-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span and nominal measuring range
• Linear characteristic	
- 20 mbar/2 kPa/8.031 inH_2O	r ≤ 5: ≤ 0.075% 5 < r ≤ 20: ≤ (0.005 · r + 0.05)%
- 60 mbar/6 kPa/24.09 inH_2O	r ≤ 5: ≤ 0.075% 5 < r ≤ 60: ≤ (0.005 · r + 0.05)%
- 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1600 mbar/160 kPa/642.4 inH_2O 5000 mbar/500 kPa/2008 inH_2O 30 bar/3 MPa/435 psi	r ≤ 5: ≤ 0.065% (SITRANS P320) ≤ 0.04% (SITRANS P420) 5 < r ≤ 100: ≤ (0.004 · r + 0.045) %
• 100 bar/10 MPa/1450 psi	r < 10: = 0.1% 10 < r < 30: = 0.2%
Influence of ambient temperature as % per 28 °C (50 °F))	
• 20 mbar/2 kPa/8.031 inH_2O	≤ (0.15 · r + 0.1)%
• 60 mbar/6 kPa/24.09 inH_2O	≤ (0.075 · r + 0.1)%
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1600 mbar/160 kPa/642.4 inH_2O 5000 mbar/500 kPa/2008 inH_2O 30 bar/3 MPa/435 psi	≤ (0.025 · r + 0.125)% (SITRANS P320)
• 250 mbar/25 kPa/3.6 psi 5000 mbar/500 kPa/2008 inH_2O	≤ (0.025 · r + 0.0625)% (SITRANS P420)
• 600 mbar/60 kPa/240.9 inH_2O 1600 mbar/160 kPa/642.4 inH_2O 30 bar/3 MPa/435 psi	≤ (0.0125 · r + 0.0625)% (SITRANS P420)
• 100 bar/10 MPa/1450 psi	0.08 · r + 0.16%
Long-term stability at ±30 °C (±54 °F))	
• 20 mbar/2 kPa/8.031 inH_2O	≤ (0.2 · r)% per year
• 60 mbar/6 kPa/24.09 inH_2O	In 5 years ≤ (0.25 · r)%
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1600 mbar/160 kPa/642.4 inH_2O 5000 mbar/500 kPa/2008 inH_2O	In 5 years ≤ (0.125 · r)% In 10 years ≤ (0.15 · r)%
• 30 bar/3 MPa/435 psi	In 5 years ≤ (0.25 · r)% In 10 years ≤ (0.35 · r)%
• 100 bar/10 MPa/1450 psi	In 5 years ≤ (0.25 · r)%
Step response time T_{63} (without electrical damping)	
• 20 mbar/2 kPa/8.031 inH_2O	Approx. 0.160 s
• 60 mbar/6 kPa/24.09 inH_2O	Approx. 0.150 s
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1600 mbar/160 kPa/642.4 inH_2O 5000 mbar/500 kPa/2008 inH_2O 30 bar/3 MPa/435 psi	Approx. 0.135 s
• 100 bar/10 MPa/1450 psi	Approx. 0.145 s
Effect of mounting position (in pressure per change of angle)	≤ 0.7 mbar/0.07 kPa/0.010 psi per 10° incline (zero offset is possible with position error compensation)
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V
Operating conditions	
Temperature of medium	
• Measuring cell with silicone oil filling	-40 … +100 °C (-40 … +212 °F)
- Measuring cell 30 bar (435 psi)	-20 … +100 °C (-4 … +212 °F)
- Measuring cell 100 bar (1450 psi)	-20 … +100 °C (-4 … +212 °F)
• Measuring cell with inert oil	-20 … +100 °C (-4 … +212 °F)
• In conjunction with dust explosion protection	-40 … +85 °C (-4 … +185 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in areas subject to explosion hazard.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil	-40 … +85 °C (-40 … +185 °F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21

for gauge pressure (differential pressure series)

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)	
Design	
Weight	Approx. 3.9 kg (8.5 lb) with aluminum enclosure Approx. 5.8 kg (12.7 lb) with stainless steel enclosure
Material	
• Wetted parts materials	
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
- Process flanges and sealing plugs	Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel type plate (1.4404/316L)
- Pressure flange screws	Stainless steel ISO 3506-1 A4-70
- Mounting bracket	Steel, electrogalvanized steel, or stainless steel
Process connection	¼-18 NPT female thread and flat connection with 7/16-20 UNF fastening screw thread in accordance with EN 61518 or M10 fastening screw thread in accordance with DIN 19213 (M12 for PN 420 (MWP 6092 psi))
Electrical connection	Screw terminals Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Keys	4 keys for operation directly on the device
Display	• With or without integrated display (optional) • Cover with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode
Ripple	$U_{SS} \leq 0.2$ V (47 … 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with the peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)	
• Dust explosion protection for zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with the peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 to 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	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
• Explosion protection according to CSA	Available soon
- Marking (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
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

[1] Han 8D is identical to Han 8U.

HART communication	
HART	230 ... 1100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

1

for gauge pressure (differential pressure series)

Selection and ordering data

	Article No.
Pressure transmitters for gauge pressure (differential pressure series)	
SITRANS P320 ↗	**7MF031 - ■■■■■ - ■■■■**
SITRANS P420 ↗	**7MF041 - ■■■■■ - ■■■■**
↗ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
Measuring cell filling	
Silicone oil	**1**
Inert filling liquid	**3**
Maximum measuring span	
20 mbar (8.037 inH_2O)	**B**
60 mbar (24.11 inH_2O)	**D**
250 mbar (1005 inH_2O)	**G**
600 mbar (241.1 inH_2O)	**H**
1 600 mbar (643 inH_2O)	**M**
5000 mbar (2009 inH_2O)	**P**
30 bar (435 psi)	**R**
Process connection	
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518)	**L**
Oval flange, mounting thread: M10 (PN 160), (DIN 19213)	**M**
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation	**N**
Oval flange, mounting thread: M10 (PN 160) (DIN 19213) with lateral ventilation	**P**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	**1**
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408	**2**
Tantalum/tantalum, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**4**
Monel 00/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**6**
Stainless steel 316L/1.4404, gold-plated, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**8**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx) • 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (cover closed)	**0**
With display (cover closed)	**1**
With display (cover with glass pane)	**2**

Selection and ordering data

Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/connector mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/connector mounted left	**A97**
Cable gland/connector mounted on right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009))	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	**D20**
FVMQ enclosure sealing	**D21**
IP66/IP68 degree of protection (not for device plugs M12 and Han)	**D30**
TAG label empty	**D40**
Without labeling of the measuring range on the TAG label	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (external)	**D71**
Adhesive labels on transport packaging (supplied by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Export approval CPA (China)	**E12**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)	**E21**
FM (USA and Canada)	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**

1

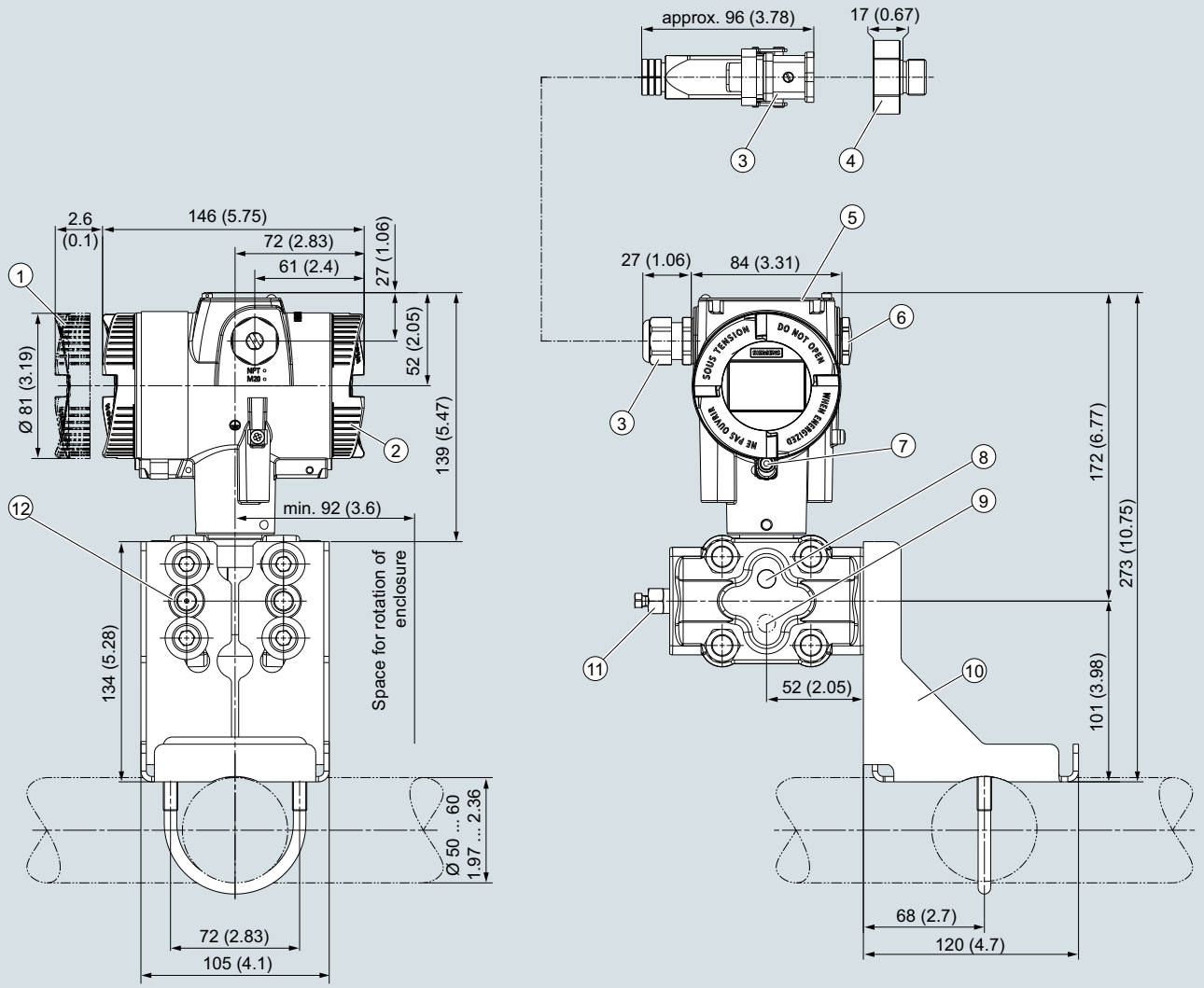
for gauge pressure (differential pressure series)

Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual seal	**E81**
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Mounting bracket	
Steel, galvanized	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Process flanges; screw plug with vent valve	
Welded in on right	**J08**
Welded in on left	**J09**
Glued in on right	**J10**
Glued in on left	**J11**
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J70**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J71**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J72**
• DN 15 PN 40, stainless steel 1.4571/316Ti	**J78**
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J73**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J74**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J75**
Flange connection options	
Flange connection and temperature extension	**J76**
Flange connection with epoxy resin coating	**J77**
Process flanges; special materials	
Reserved for 7MF7: without process flanges, without screws, without gaskets	**K00**
Process flange material alloy C22/2.4602	**K01**
Process flange material Monel 400/2.4360	**K02**
Process connection material PVDF, on the side ½-14 NPT	**K05**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	**K06**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	**K07**
Process flanges; process connection option	
Process flange with process connection G½ welded on	**K20**
Process connection NAM (ASTAVA)	**K21**
Process flanges chambered with gaskets	
1x chambered, graphite	**K40**
1x chambered, PTFE	**K41**
2x chambered, PTFE	**K42**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE	**K50**
O-ring, process flanges, FEP (with silicone core, approved for food)	**K51**
O-ring, process flanges, FFKM (FFPM)	**K52**
O-ring, process flanges, NBR	**K53**
O-ring, process flanges, EPDM	**K54**

Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	**K81**
Process flanges (+) - side front	**K82**
Process flange screws, process flange nuts, material Monel 400/2.4360	**K83**
Valve ¼-18 NPT, material same as process flanges	**K84**
Valve mounted on the side, measured medium: Gas	**K85**
Oval flange enclosed, gasket PTFE + mounting screws	**K86**
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U01**
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U02**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U03**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U04**

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, inHg, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special version Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

Dimensional drawings



1. Electronics side, local display
   (longer overall length for cover with glass pane)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2][3] device plug
   - M12 device plug[2][3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch
   (only for "flameproof enclosure" type of protection)
8. Lateral ventilation for liquid measurement (Standard)
9. Lateral ventilation for gas measurement (order option K85)
10. Mounting bracket (optional)
11. Sealing plug with valve (optional)
12. Process connection: ¼-18 NPT (IEC 61518)

[1] In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for relative pressure (differential pressure series), dimensions in mm (inch)

Technical specifications

SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm			
Input of gauge pressure, with flush-mounted diaphragm			
Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range, max. operating pressure and max. test pressure	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 … 14.5 psi	Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange[1)]	
	0.04 ... 4 bar 4 ... 400 kPa 0.58 … 58 psi		
	0.16 ... 16 bar 0.016 ... 1.6 MPa 2.3 … 232 psi		
	0.6 ... 63 bar 0.063 ... 6.3 MPa 9.1 … 914 psi		
Measuring limits			
• Low measuring limit			
- Measuring cell with silicone oil filling	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with inert oil	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with FDA-compliant oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of max. measuring span		
Input of absolute pressure, with flush-mounted diaphragm			
Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range, max. operating pressure and max. test pressure	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	43 … 1300 mbar a 4.3 ... 130 kPa a 17 … 525 inH_2O a	Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange[1)]	
	166 … 5000 mbar a 16.6 ... 500 kPa a 2.41 … 72.5 psi a		
	1 … 30 bar a 0.1 ... 3 MPa a 14.5 … 435 psi a		
	Depending on the process connection, the measuring span may differ from these values.		
Measuring limits			
• Low measuring limit			
- Measuring cell with silicone oil filling	0 bar a/0 kPa a/0 psi a		
• Upper measuring limit	100% of max. measuring span		
Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Low saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• High saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 … 100 s, continuously adjustable over remote operation		
	0 … 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 … 22.8 mA		
• Failure signal	3.55 … 22.8 mA		
Load	Resistor R [Ω]		
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V		
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld))		
	R = 230 … 500 Ω (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		

for gauge and absolute pressure, flush-mounted diaphragm

SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm		
Gauge pressure measuring accuracy, with flush-mounted diaphragm		
Reference conditions	• According to EN 60770-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)	
Conformity error at limit point setting, including hysteresis and repeatability		
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range	
• Linear characteristic		
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	r ≤ 5: 5 < r ≤ 100:	≤ 0.075% ≤ (0.005 · r + 0.05)%
Influence of ambient temperature in % per 28 °C (50 °F)		
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	≤ (0.08 · r + 0.16)%	
Influence of the temperature of medium (in pressure per temperature unit)		
• Temperature difference between temperature of medium and ambient temperature	3 mbar/0.3 kPa/0.04 psi per 10 K	
Long-term stability at ±30 °C (±54 °F)		
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi	In 5 years ≤ (0.25 · r)%	
• 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	In 5 years ≤ (0.125 · r)%	
Step response time T_{63} (without electrical damping)	≤ 0.105 s	
Effect of mounting position (in pressure per change of angle)	0.4 mbar/0.04 kPa/0.006 per 10° incline (zero point correction is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	
Absolute pressure measuring accuracy with flush diaphragm		
Reference conditions	• According to EN 60770-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)	
Conformity error at limit point setting, including hysteresis and repeatability		
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range	
• Linear characteristic		
- All measuring cells	r ≤ 10: 10 < r ≤ 30:	≤ 0.2% ≤ 0.4%
Influence of ambient temperature in % per 28 °C (50 °F)		
• All measuring cells	≤ (0.16 · r + 0.24)%	
Influence of the temperature of medium (in pressure per temperature unit)		
• Temperature difference between temperature of medium and ambient temperature	3 mbar/0.3 kPa/0.04 psi per 10 K	
Long-term stability at ±30 °C (±54 °F)		
• All measuring cells	In 5 years ≤ (0.25 · r)%	
Step response time T_{63} (without electrical damping)	≤ 0.105 s	
Effect of mounting position (in pressure per change of angle)	0.4 mbar/0.04 kPa/0.006 per 10° incline (zero point correction is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	

SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm	
Operating conditions	
Temperature of medium[2)]	
• Measuring cell with silicone oil filling	-40 … +150 °C (-40 … +302 °F) -40 … +200 °C (-40 … +392 °F) with cooling extension
• Measuring cell with inert oil	-20 … +100 °C (-4 … +212 °F)
• Measuring cell with FDA-compliant oil	-10 … +150 °C (14 … +302 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in areas subject to explosion hazard.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil (different pressure classes)	1 bar/100 kPa/14.5 psi -40 ... +85 °C (-40 ... +185 °F) 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 ps
- Measuring cell with FDA-compliant oil	-10 ... +85°C (14 ... +185°F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Design	
Weight (pressure transmitter without mounting flange)	
Material	
• Wetted parts materials	
- Process connection	Stainless steel, mat. no. 1.4404/316L
- Seal diaphragm	Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel type plate (1.4404/316L)
- Mounting bracket	Steel, electrogalvanized steel, or stainless steel
Process connection	• Flanges according to EN and ASME • F&B and pharmaceutical flanges • BioConnect/BioControl • PMC style
Electrical connection	Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[3)] • Device plug M12
Displays and controls	
Keys	4 keys for operation directly on the device
Display	• With or without integrated display (optional) • Cover with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode
Ripple	$U_{ss} \leq 0.2$ V (47 … 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–

SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm

Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with the peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 to 30 V, 4 ... 20 mA

SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm	
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	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
• Explosion protection according to CSA	Available soon
- Marking (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
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

1) The MAWP value of the pressure transmitter can be lower than the PN value of the mounting flange and vice versa.
To determine the maximum permissible operating pressure and the maximum permissible test pressure, use the lowest value as reference.

2) Observe the temperature limits in the process connection standards (e.g. DIN 32676 and DIN 11851) for the maximum temperature of medium for flush-mounted process connections.

3) Han 8D is identical to Han 8U.

HART communication	
HART	230 ... 1100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

for gauge and absolute pressure, flush-mounted diaphragm

Selection and ordering data

	Article No.
Pressure transmitter for gauge and absolute pressure, with flush-mounted diaphragm	
SITRANS P320 for gauge pressure ↗	**7MF030 - ■■■■■ - ■■■■**
SITRANS P420 for gauge pressure ↗	**7MF040 - ■■■■■ - ■■■■**
SITRANS P320 for absolute pressure ↗	**7MF032 - ■■■■■ - ■■■■**
SITRANS P420 for absolute pressure ↗	**7MF042 - ■■■■■ - ■■■■**
↗ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
Measuring cell filling	
Silicone oil	**1**
Inert filling liquid	**3**
Neobee oil	**4**
Maximum measuring span	
1000 mbar (14.5 psi)	**0 J**
4000 mbar (58 psi)	**0 N**
16 bar (232 psi)	**0 Q**
63 bar (914 psi)	**0 T**
1 300 mbar a (18.9 psi a)	**2 L**
5000 mbar a (72.5 psi a)	**2 P**
30 bar a (435 psi a)	**2 R**
Process connection	
Flush-mounted diaphragm	**K**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819	**1**
Alloy C22/2.4602, alloy C276/2.4819	**2**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx) • 2 x M20 x 1.5 • 2 x ½-14 NPT	**F** **M**
Local operation/display	
Without display (cover closed)	**0**
With display (cover closed)	**1**
With display (cover with glass pane)	**2**

Selection and ordering data

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/connector mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/connector mounted left	**A97**
Cable gland/connector mounted on right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009))	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	**D20**
FVMQ enclosure sealing	**D21**
IP66/IP68 degree of protection (not for device plugs M12 and Han)	**D30**
TAG label empty	**D40**
Without labeling of the measuring range on the TAG label	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (external)	**D71**
Adhesive labels on transport packaging (supplied by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Export approval CPA (China)	**E12**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)	**E21**
FM (USA and Canada)	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**

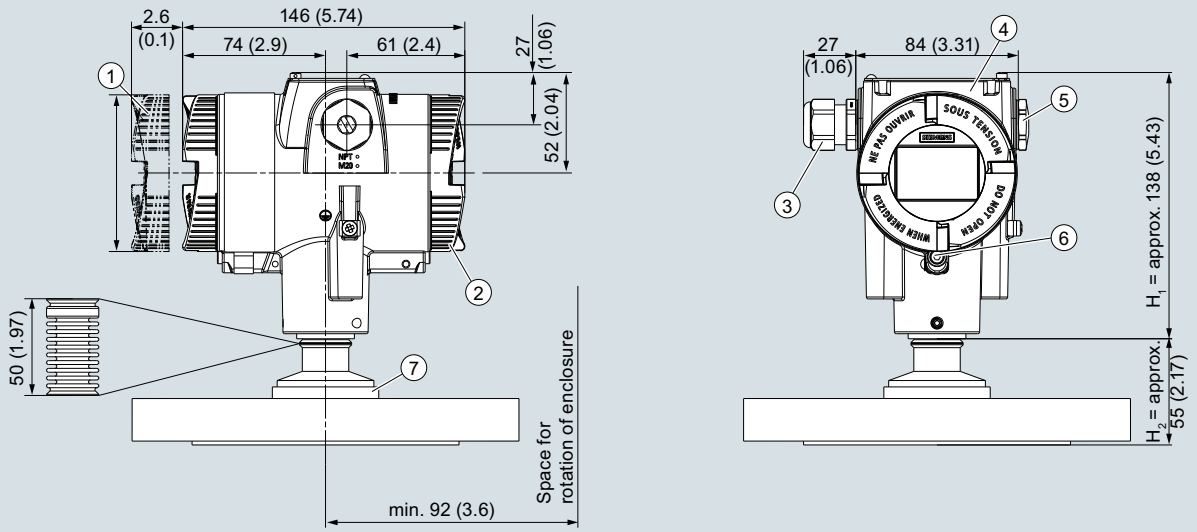
for gauge and absolute pressure, flush-mounted diaphragm

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual seal	**E81**
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
3A (hygiene)	**E86**
EHEDG (hygiene)	**E87**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
Seal (EN 837-1) material Fe (soft iron)	**K60**
Seal (EN 837-1) material 1.4571	**K61**
Seal (EN 837-1) material Cu	**K62**
Process connection	
Process connection male thread G½, bore hole 11 mm	**K80**
Flanges according to DIN EN 1092-1 Form B1 and ASME standard B16.5	
EN 1092-1 Form B1	
• DN 50 PN 16	**M03**
• DN 80 PN 16	**M05**
• DN 25 PN 40	**M10**
• DN 40 PN 40	**M12**
• DN 50 PN 40	**M13**
• DN 80 PN 40	**M15**
• DN 40 PN 100	**M22**
ASME B16.5	
• 1" Class 150 RF	**M30**
• 1 ½" Class 150 RF	**M31**
• 2" Class 150 RF	**M32**
• 3" Class 150 RF	**M33**
• 4" Class 150 RF	**M34**
• 1 ½" Class 300 RF	**M36**
• 2" Class 300 RF	**M37**
• 3" Class 300 RF	**M38**
• 4" Class 300 RF	**M39**
Sanitary connections in accordance with the standard	
Sanitary flange DIN 11851	
• with slotted union nut DN 50 PN 25	**N03**
• with slotted union nut DN 80 PN 25	**N05**
Tri-Clamp	
• DIN 32676 DN 50 PN 16	**N14**
• DIN 32676 DN 65 PN 10	**N15**
• ISO 2852 2" PN 40	**N22**
• ISO 2852 3" PN 40	**N23**
Aseptic threaded socket	
• DIN 11864-1 Form A DN 50 PN 25	**N33**
• DIN 11864-1 Form A DN 65 PN 25	**N34**
• DIN 11864-1 Form A DN 80 PN 25	**N35**
• DIN 11864-1 Form A DN100 PN 25	**N36**
Aseptic flange with notch	
• DIN 11864-2 Form A DN 50 PN 16	**N43**
• DIN 11864-2 Form A DN 65 PN 16	**N44**
• DIN 11864-2 Form A DN 80 PN 16	**N45**
• DIN 11864-2 Form A DN100 PN 16	**N46**
Aseptic clamp with groove	
• DIN 11864-3 Form A DN 50 PN 25	**N53**
• DIN 11864-3 Form A DN 65 PN 25	**N54**
• DIN 11864-3 Form A DN 80 PN 16	**N55**
• DIN 11864-3 Form A DN100 PN 16	**N56**

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Sanitary connections manufacturer-specific	
Varivent type N for pipes DN 40 ... DN 125 PN 40	**P06**
Sanitary connections special design	
Tank connection	
• TG 52/50 PN 40 with seal	**Q00**
• TG 52/150 PN 40 with seal	**Q01**
DRD flange D = 65 mm DN 50 PN 40	**Q15**
SMS socket	
• with thread 2" PN 25	**Q28**
• with thread 2 ½" PN 25	**Q29**
• with thread 3" PN 25	**Q30**
Weldable sockets for tank connection	
Weldable piece for TG52/50	**Q90**
Weldable piece for TG52/150	**Q91**
Connections for the paper industry	
Process connection PMC Style Standard	**R00**
Process connection PMC Style Minibolt	**R01**
Weldable sockets for PMC Style Standard	**R02**
Weldable sockets for PMC Style Minibolt	**R03**
Threaded connection	
Male thread G¾-A DIN 3852	**R11**
Male thread G1-A DIN 3852	**R12**
Male thread G2-A DIN 3852	**R14**
Special options front-flush	
Temperature decoupler (media temperature up to 200 °C)	**R85**
Mating connector including seal	**R90**

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, inHg, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special version Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

Dimensional drawings



1. Electronics side, local display
   (longer overall length for cover with glass pane)[1)]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3)] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2) 3)] device plug
   - M12 device plug[2) 3]
4. Cover over buttons and nameplate
   with general information
5. Blanking plug
6. Safety catch
   (only for "flameproof enclosure" type of protection)
7. Process connection

1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter, with flush-mounted diaphragm, dimensions in mm (inch)

This figure consists of a SITRANS P320/P420 with an example flange.
In this figure, the height is divided into H_1 and H_2.

H_1 = Height of the SITRANS P320P420 up to a defined cross-section

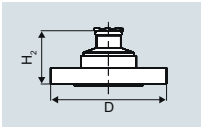
H_2 = Height of the flange up to this defined cross-section

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

Flanges according to EN and ASME

Flange according to EN

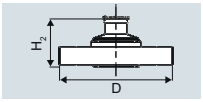
EN 1092-1



Order code	DN	PN	∅D	H_2
M03	50	16	165 mm (6.5")	Approx. 52 mm (2")
M05	80	16	200 mm (7.9")	
M10	25	40	115 mm (4.5")	
M12	40	40	150 mm (5.9")	
M13	50	40	165 mm (6.5")	
M15	80	40	200 mm (7.9")	
M22	40	100	170 mm (6.7")	

Flanges according to ASME

ASME B16.5

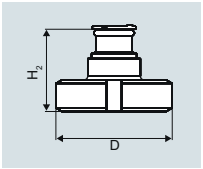


Order code	DN	Class	∅D	H_2
M30	1"	150	110 mm (4.3")	Approx. 52 mm (2")
M31	1½"	150	125 mm (4.9")	
M32	2"	150	150 mm (5.9")	
M33	3"	150	190 mm (7.5")	
M34	4"	150	230 mm (9.1")	
M36	1½"	300	155 mm (6.1")	
M37	2"	300	165 mm (6.5")	
M38	3"	300	210 mm (8.1")	
M39	4"	300	255 mm (10.0")	

NuG and pharmaceutical connections

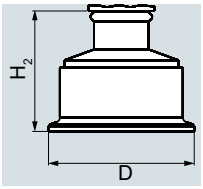
Connections to DIN

DIN 11851 (milk pipe union with slotted union nut)



Order code	DN	PN	∅D	H_2
N03	50	25	92 mm (3.6")	Approx. 52 mm (2")
N05	80	25	127 mm (5.0")	

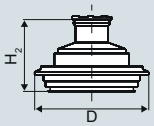
TriClamp according to DIN 32676



Order code	DN	PN	∅D	H_2
N14	50	16	64 mm (2.5")	Approx. 52 mm (2")
N15	65	16	91 mm (3.6")	
N22	2"	16	64 mm (2.5")	Approx. 52 mm (2")
N23	3"	10	91 mm (3.6")	

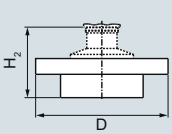
Other connections

Varivent connection



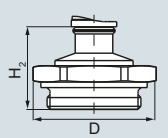
Order code	DN	PN	∅D	H_2
P06	40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

Sanitary process connection according to DRD



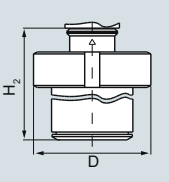
Order code	DN	PN	∅D	H_2
Q15	65	40	105 mm (4.1")	Approx. 52 mm (2")

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



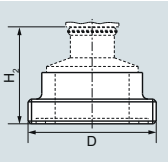
Order code	DN	PN	∅D	H_2
R11	¾"	60	37 mm (1.5")	Approx. 45 mm (1.8")
R12	1"	60	48 mm (1.9")	Approx. 47 mm (1.9")
R14	2"	60	78 mm (3.1")	Approx. 52 mm (2")

Tank connection TG 52/50 and TG52/150



Order code	DN	PN	∅D	H_2
Q00	25	40	63 mm (2.5")	Approx. 63 mm (2.5")
Q01	25	40	63 mm (2.5")	Approx. 170 mm (6.7")

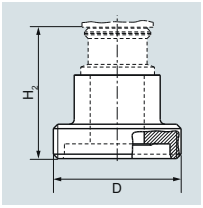
SMS threaded socket



Order code	DN	PN	∅D	H_2
Q28	2"	25	70 x 1/6 mm	Approx. 52 mm (2.1")
Q29	2½"	25	85 x 1/6 mm	
Q30	3"	25	98 x 1/6 mm	

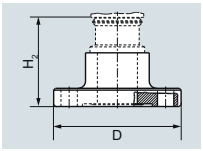
for gauge and absolute pressure, flush-mounted diaphragm

Aseptic threaded socket according to DIN 11864-1 Form A



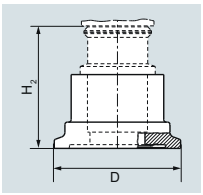
Order code	DN	PN	∅D	H_2
N33	50	25	78 x 1/6"	Approx. 52 mm (2.1")
N34	65	25	95 x 1/6"	
N35	80	25	110 x ¼"	
N36	100	25	130 x ¼"	

Aseptic flange with notch to DIN 11864-2 Form A



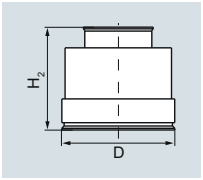
Order code	DN	PN	∅D	H_2
N43	50	16	94 (3.7")	Approx. 52 mm (2.1")
N44	65	16	113 (4.4")	
N45	80	16	133 (5.2")	
N46	100	16	159 (6.3")	

Aseptic clamp with groove according to DIN 11864-3 Form A



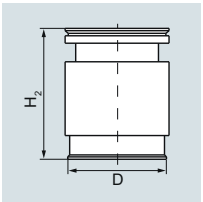
Order code	DN	PN	∅D	H_2
N53	50	25	77.5 (3.1")	Approx. 52 mm (2.1")
N54	65	25	91 (3.6")	
N55	80	16	106 (4.2")	
N56	100	16	130 (5.1")	

Process connection PMC Style Standard



Order code	DN	PN	∅D	H_2
R00	-	-	40.9 mm (1.6")	Approx. 36.8 mm (1.4")

Process connection PMC Style Minibolt



Order code	DN	PN	∅D	H_2
R01	-	-	26.3 mm (1.0")	Approx. 33.1 mm (1.3")

Technical specifications

SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)

Input			
Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 … 250 mbar a	4 bar a	6 bar a
	0.83 ... 25 kPa a	0.4 MPa a	0.6 MPa a
	3.3 … 100.5 inH_2O a	58 psi a	87 psi a
	43 … 1300 mbar a	6.6 bar a	10 bar a
	4.3 ... 130 kPa a	0.66 MPa a	1 MPa a
	17.3 … 522 inH_2O a	95 psi a	145 psi a
	166 … 5000 mbar a	20 bar a	30 bar a
	16.6 ... 500 kPa a	2 MPa a	3 MPa a
	2.41 … 72.5 psi a	290 psi a	435 psi a
	1 … 30 bar a	65 bar a	100 bar a
	0.1 ... 3 MPa a	6.5 MPa a	10 MPa a
	14.5 … 435 psi a	942 psi a	1450 psi a
	5.3 … 160 bar a	240 bar	380 bar a
	0.53 ... 16 MPa a	24 MPa	38 MPa a
	77 … 2321 psi a	3481 psi	5511 psi a
	13.3 … 400 bar a	400 bar a	600 bar a
	1.3 ... 40 MPa a	40 MPa a	60 MPa a
	192 … 5802 psi a	5802 psi a	8702 psi a
	23.3 … 700 bar a	800 bar a	800 bar a
	2.3 ... 70 MPa a	80 MPa a	80 MPa a
	337 … 10153 psi a	11603 psi a	11603 psi a
Measuring limits			
• Low measuring limit			
- Measuring cell with silicone oil filling	0 mbar a/kPa a/psi a		
- Measuring cell with inert oil	For temperature of medium -20-°C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)		30 mbar a/3 kPa a/0.44 psi a
	For temperature of medium 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))		30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C 3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C 0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Low saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• High saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current		
Adjustable damping	0 … 100 s, continuously adjustable over remote operation		
	0 … 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 … 22.8 mA		
• Failure signal	3.55 … 22.8 mA (factory preset to 3.55 mA)		
Load	Resistor R [Ω]		
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V		
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld))		
	R = 230 … 500 Ω (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		

for absolute pressure (pressure series)

SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)	
Measuring accuracy	
Reference conditions	• According to EN 60770-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range
• Linear characteristic (all measuring cells)	
- r ≤ 10	≤ 0.1%
- 10 < r ≤ 30	≤ 0.2%
Influence of ambient temperature (in % per 28 °C (50 °F))	
• 250 mbar a/25 kPa a/3.6 psi a	≤ (0.15 · r + 0.1)%
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2321 psi a 400 bar a/40 MPa a/5802 psi a 700 bar a/70 MPa a/10153 psi a	≤ (0.08 · r + 0.16)%
Long-term stability at ±30 °C (±54 °F)	In 5 years ≤ (0.25 · r)%
Step response time T_{63} (without electrical damping)	Approx. 0.105 s
Effect of mounting position (in pressure per change of angle)	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° incline (zero point correction is possible with position error compensation)
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V
Operating conditions	
Temperature of medium	
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)
• Measuring cell with inert filling fluid	-20 ... +100 °C (-4 ... +212 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in areas subject to explosion hazard.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert filling fluid	-40 … +85 °C (-40 … +185 °F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21

SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)	
Design	
Weight	Approx. 2.3 kg (5.07 lb) with aluminum enclosure Approx. 4.2 kg (9.25 lb) for stainless steel enclosure
Material	
• Wetted parts materials	
- Process connection	Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602
- Oval flange	Stainless steel, mat. no. 1.4404/316L
- Seal diaphragm	Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel type plate (1.4404/316L)
- Mounting bracket	Electrogalvanized steel or stainless steel
Process connection	• Connection shank G1/2A according to DIN EN 837-1 • Female thread ½-14 NPT • Male thread M20 x 1.5 and ½-14 NPT • Oval flange (PN 160 (MWP 2320 psi g)) with fastening screw thread: - 7/16-20 UNF according to EN 61518 - M10 according to DIN 19213 • Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread: - 7/16-20 UNF according to EN 61518 - M12 according to DIN 19213 • Male thread M20 x 1.5 and ½-14 NPT
Electrical connection	Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Keys	4 keys for operation directly on the device
Display	• With or without integrated display (optional) • Cover with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode
Ripple	$U_{SS} \leq 0.2$ V (47 … 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA

for absolute pressure (pressure series)

SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)	
• Dust explosion protection for zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with the peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 to 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	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
• Explosion protection according to CSA	Available soon
- Marking (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
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

[1] Han 8D is identical to Han 8U.

HART communication	
HART	230 ... 1100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

Selection and ordering data

	Article No.
Pressure transmitters for absolute pressure (pressure series)	
SITRANS P320 ↗	**7MF032 - ■■■■■ - ■■■■**
SITRANS P420 ↗	**7MF042 - ■■■■■ - ■■■■**
↗ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
Measuring cell filling	
Silicone oil	**1**
IInert filling liquid	**3**
Maximum measuring span	
250 mbar a (100.5 inH_2O a)	**F**
1 300 mbar a (522 inH_2O a)	**L**
5000 mbar a (72.5 psi a)	**P**
30 bar a (435 psi a)	**R**
160 bar a (2 321 psi a)	**V**
400 bar a (5 802 psi a)	**W**
700 bar a (10153 psi a)	**X**
Process connection	
Male thread M20 x 1.5	**B**
Male thread G½ (DIN EN 837-1)	**D**
Female thread ½-14 NPT	**E**
Male thread ½-14 NPT	**F**
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518)	**G**
Oval flange, mounting thread: M10 (DIN 19213)	**H**
Oval flange, mounting thread: M12 (DIN 19213)	**J**
Version for diaphragm seal pressure	**U**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819	**1**
Alloy C22/2.4602, alloy C276/2.4819	**2**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx) • 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (cover closed)	**0**
With display (cover closed)	**1**
With display (cover with glass pane)	**2**

Selection and ordering data

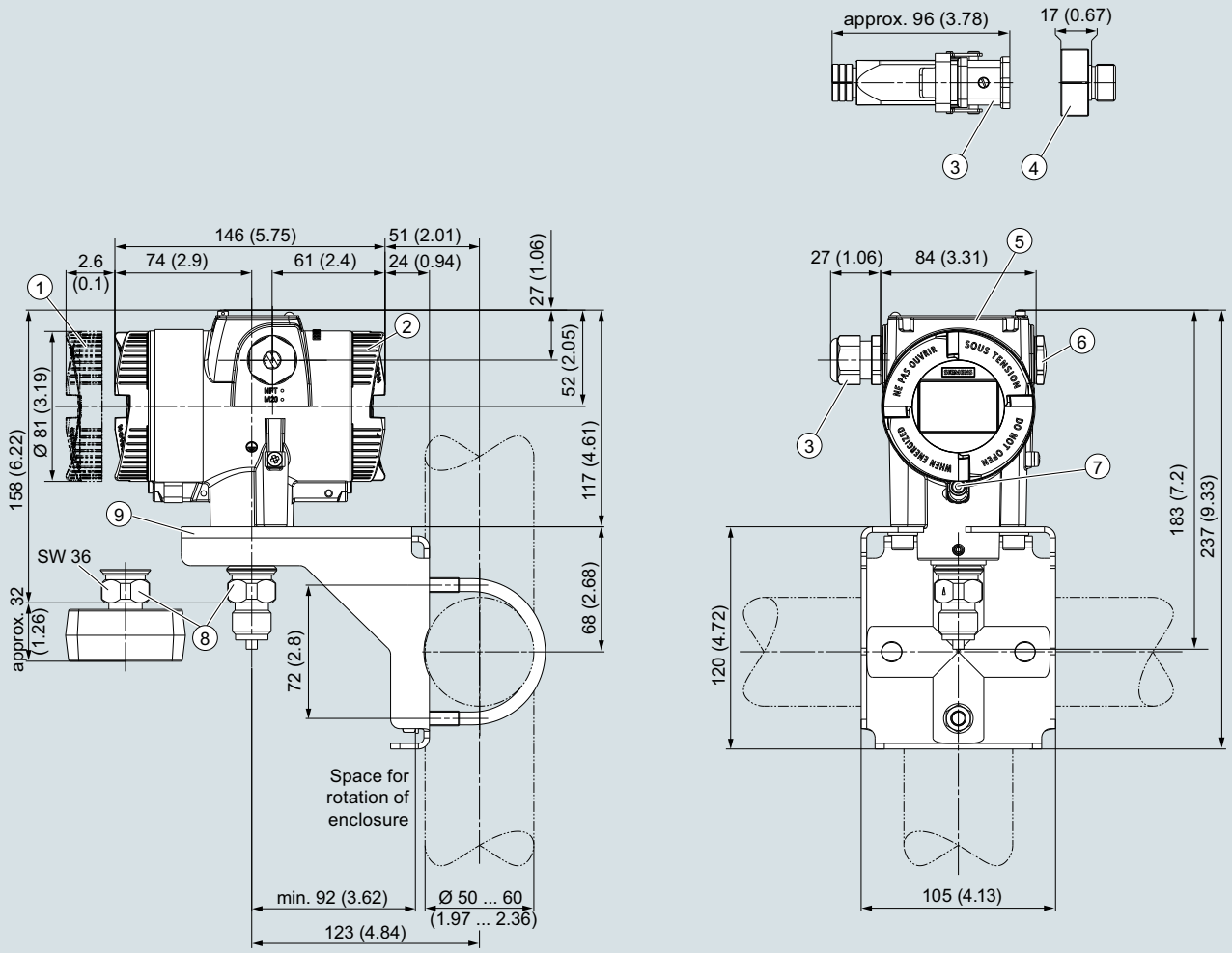
Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/connector mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/connector mounted left	**A97**
Cable gland/connector mounted on right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009))	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	**D20**
FVMQ enclosure sealing	**D21**
IP66/IP68 degree of protection (not for device plugs M12 and Han)	**D30**
TAG label empty	**D40**
Without labeling of the measuring range on the TAG label	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (external)	**D71**
Adhesive labels on transport packaging (supplied by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Export approval CPA (China)	**E12**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)	**E21**
FM (USA and Canada)	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual seal	**E81**
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Mounting bracket	
Steel, galvanized	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Flange connections with flange EN 1092-1	
With flange adapter G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J80**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J81**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J82**
With siphon G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J83**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J84**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J85**
• DN 25 PN 100, stainless steel 1.4571/316Ti	**J86**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
Seal (EN 837-1) material Fe (soft iron)	**K60**
Seal (EN 837-1) material 1.4571	**K61**
Seal (EN 837-1) material Cu	**K62**
Process connection	
Process connection male thread G½, bore hole 11 mm	**K80**
Shut-off valves, valve manifolds	
With mounted valve manifold 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in in factory certificate (EN 10204-2.2)	**T02**
With mounted valve manifold 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	**T03**
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	**T05**
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	**T06**

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH$_2$O, inH$_2$O (4°C), ftH$_2$O, mmH$_2$O, mmH$_2$O (4°C), mH$_2$O (4°C), mmHg, inHg, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special version Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

Dimensional drawings



1. Electronics side, local display (longer overall length for cover with glass pane)[1)]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3)] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2) 3)] device plug
   - M12 device plug[2) 3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection)
8. Process connection: G½B connection pin or oval flange
9. Mounting bracket (optional)

1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for absolute pressure (pressure series), dimensions in mm (inch)

Technical specifications

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)

Input			
Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 … 250 mbar a	160 bar a	240 bar a
	0.83 ... 25 kPa a	16 MPa a	24 MPa a
	3.3 … 100.5 inH_2O a	2320 psi a	3481 psi a
	43 … 1300 mbar a	160 bar a	240 bar a
	4.3 ... 130 kPa a	16 MPa a	24 MPa a
	17.3 … 522 inH_2O a	2320 psi a	3481 psi a
	166 … 5000 mbar a	160 bar a	240 bar a
	16.6 ... 500 kPa a	16 MPa a	24 MPa a
	2.41 … 72.5 psi a	2320 psi a	3481 psi a
	1 … 30 bar a	160 bar a	240 bar a
	0.1 ... 3 MPa a	16 MPa a	24 MPa a
	14.5 … 435 psi a	2320 psi a	3481 psi a
	5 … 100 bar a	160 bar a	240 bar a
	0.5 ... 10 MPa a	16 MPa a	24 MPa a
	76.9 … 1450 psi a	2320 psi a	3481 psi a
Measuring limits			
• Low measuring limit			
- Measuring cell with silicone oil filling	0 mbar a/kPa a/psi a		
- Measuring cell with inert liquid	For temperature of medium -20-°C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)		30 mbar a/3 kPa a/0.44 psi a
	For temperature of medium 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))		30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C
			3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C
			0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Low saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• High saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current		
Adjustable damping	0 … 100 s, continuously adjustable over remote operation		
	0 … 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 … 22.8 mA		
• Failure signal	3.55 … 22.8 mA		
Load	Resistor R [Ω]		
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V		
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld))		
	R = 230 … 500 Ω (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		
Measuring accuracy			
Reference conditions	• According to EN 60770-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)		

for absolute pressure (differential pressure series)

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)	
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range
• Linear characteristic (all measuring cells)	
- r ≤ 10	≤ 0.1%
- 10 < r ≤ 30	≤ 0.2%
Influence of ambient temperature (in % per 28 °C (50 °F))	
• 250 mbar a/25 kPa a/3.6 psi a	≤ (0.15 · r + 0.1)%
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 100 bar a/10 MPa a/1450 psi a	≤ (0.08 · r + 0.16)%
Long-term stability at ±30 °C (±54 °F)	In 5 years ≤ (0.25 · r)%
Step response time T_{63} (without electrical damping)	
• 250 mbar a/25 kPa a/3.6 psi a	Approx. 0.195 s
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 100 bar a/10 MPa a/1450 psi a	Approx. 0.145 s
Effect of mounting position (in pressure per change of angle)	≤ 0.7 mbar/0.07 kPa/0.010 psi per 10° incline (zero offset is possible with position error compensation)
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V
Operating conditions	
Temperature of medium	
• Measuring cell with silicone oil filling	-40 … +100 °C (-40 … +212 °F)
- Measuring cell 30 bar (435 psi)	-20 … +100 °C (-4 … +212 °F)
- Measuring cell 100 bar (1450 psi)	-20 … +100 °C (-4 … +212 °F)
• Measuring cell with inert oil	-20 … +100 °C (-4 … +212 °F)
• In conjunction with dust explosion protection	-40 … +85 °C (-4 … +185 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in areas subject to explosion hazard.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil	-40 … +85 °C (-40 … +185 °F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F); with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Design	
Weight	Approx. 3.9 kg (8.5 lb) with aluminum enclosure Approx. 5.8 kg (12.7 lb) with stainless steel enclosure
Material	
• Wetted parts materials	
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
- Process flanges and sealing plugs	Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel type plate (1.4404/316L)
- Pressure flange screws	Stainless steel ISO 3506-1 A4-70
- Mounting bracket	Steel, electrogalvanized steel, or stainless steel
Process connection	¼-18 NPT female thread and flat connection with 7/16-20 UNF fastening screw thread in accordance with EN 61518 or M10 fastening screw thread in accordance with DIN 19213 (M12 for PN 420 (MWP 6092 psi))
Electrical connection	Screw terminals Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)	
Displays and controls	
Keys	4 keys for operation directly on the device
Display	• With or without integrated display (optional) • Cover with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode
Ripple	$U_{SS} \leq 0.2$ V (47 … 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with the peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)	
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 to 30 V, 4 ... 20 mA
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	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
• Explosion protection according to CSA	Available soon
- Marking (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
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

[1] Han 8D is identical to Han 8U.

HART communication	
HART	230 ... 1100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

Selection and ordering data

	Article No.
Pressure transmitters for absolute pressure (differential pressure series)	
SITRANS P320 ↗	**7MF033 - □□□□□ - □□□□**
SITRANS P420 ↗	**7MF043 - □□□□□ - □□□□**
↗ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
Measuring cell filling	
Silicone oil	**1**
Inert filling liquid	**3**
Maximum measuring span	
250 mbar a (100.5 inH_2O a)	**G**
1 300 mbar a (522 inH_2O a)	**L**
5000 mbar a (72.5 psi a)	**P**
30 bar a (435 psi a)	**R**
100 bar a (1450 psi a)	**U**
Process connection	
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518)	**Q**
Oval flange, mounting thread: M10 (DIN 19213)	**R**
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation	**S**
Oval flange, mounting thread: M10 (DIN 19213) with lateral ventilation	**T**
Version for diaphragm seal with mounting thread $^7/_{16}$-20 UNF (IEC 61518)	**V**
Version for diaphragm seal with mounting thread M10 (DIN 19213)	**W**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	**1**
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408	**2**
Tantalum/tantalum, process flange stainless steel 316/1.4408	**4**
Monel 00/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408	**6**
Stainless steel 316L/1.4404, gold-plated, process flange stainless steel 316/1.4408	**8**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx) • 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (cover closed)	**0**
With display (cover closed)	**1**
With display (cover with glass pane)	**2**

Selection and ordering data

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/connector mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/connector mounted left	**A97**
Cable gland/connector mounted on right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009))	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	**D20**
FVMQ enclosure sealing	**D21**
IP66/IP68 degree of protection (not for device plugs M12 and Han)	**D30**
TAG label empty	**D40**
Without labeling of the measuring range on the TAG label	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (external)	**D71**
Adhesive labels on transport packaging (supplied by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Export approval CPA (China)	**E12**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)	**E21**
FM (USA and Canada)	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**

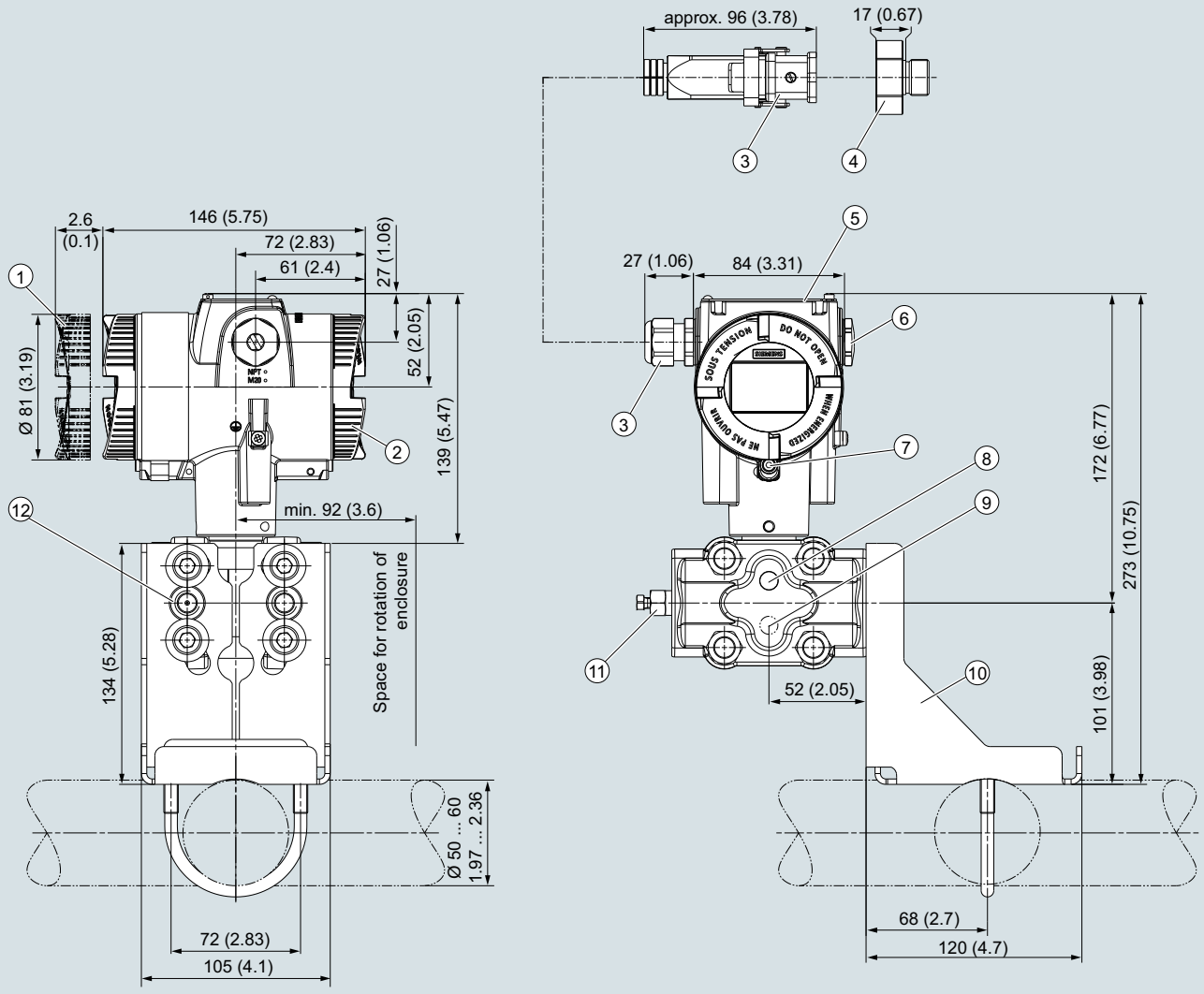
Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual seal	**E81**
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Mounting bracket	
Steel, galvanized	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Process flanges; screw plug with vent valve	
Welded in on right	**J08**
Welded in on left	**J09**
Glued in on right	**J10**
Glued in on left	**J11**
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J70**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J71**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J72**
• DN 15 PN 40, stainless steel 1.4571/316Ti	**J78**
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J73**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J74**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J75**
Flange connection options	
Flange connection and temperature extension	**J76**
Flange connection with epoxy resin coating	**J77**
Process flanges; special materials	
Reserved for 7MF7: without process flanges, without screws, without gaskets	**K00**
Process flange material alloy C22/2.4602	**K01**
Process flange material Monel 400/2.4360	**K02**
Process connection material PVDF, on the side ½-14 NPT	**K05**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	**K06**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	**K07**
Process flanges; process connection option	
Process flange with process connection G½ welded on	**K20**
Process connection NAM (ASTAVA)	**K21**
Process flanges chambered with gaskets	
1x chambered, graphite	**K40**
1x chambered, PTFE	**K41**
2x chambered, PTFE	**K42**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE	**K50**
O-ring, process flanges, FEP (with silicone core, approved for food)	**K51**
O-ring, process flanges, FFKM (FFPM)	**K52**
O-ring, process flanges, NBR	**K53**
O-ring, process flanges, EPDM	**K54**

Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	**K81**
Process flanges (+) - side front	**K82**
Process flange screws, process flange nuts, material Monel 400/2.4360	**K83**
Valve ¼-18 NPT, material same as process flanges	**K84**
Valve mounted on the side, measured medium: Gas	**K85**
Oval flange enclosed, gasket PTFE + mounting screws	**K86**
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U01**
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U02**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U03**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U04**

for absolute pressure (differential pressure series)

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, inHg, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special version Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

Dimensional drawings



1. Electronics side, local display
   (longer overall length for cover with glass pane)[1)]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3)] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2) 3)] device plug
   - M12 device plug[2) 3)]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch
   (only for "flameproof enclosure" type of protection)
8. Lateral ventilation for liquid measurement (Standard)
9. Lateral ventilation for gas measurement (order option K85)
10. Mounting bracket (optional)
11. Sealing plug with valve (optional)
12. Process connection: ¼-18 NPT (IEC 61518)

1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for absolute pressure (differential pressure series), dimensions in mm (inch)

Technical specifications

SITRANS P320 / SITRANS P420 for differential pressure and flow

Input

Measured variable	Differential pressure and flow		
Measuring span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	1 ... 20 mbar	160 bar	240 bar
	0.1 ... 2 kPa	16 MPa	24 MPa
	0.4019 … 8.037 inH_2O	2320 psi	3481 psi
	1 ... 60 mbar	160 bar	240 bar
	0.1 ... 6 kPa	16 MPa	24 MPa
	0.4019 … 24.11 inH_2O	2320 psi	3481 psi
	2.5 ... 250 mbar	160 bar	240 bar
	0.2 ... 25 kPa	16 MPa	24 MPa
	1.005 … 100.5 inH_2O	2320 psi	3481 psi
	6 ... 600 mbar	160 bar	240 bar
	0.6 ... 60 kPa	16 MPa	24 MPa
	2.41 … 241.1 inH_2O	2320 psi	3481 psi
	16 ... 1600 mbar	160 bar	240 bar
	1.6 ... 160 kPa	16 MPa	24 MPa
	6.43 … 643 inH_2O	2320 psi	3481 psi
	50 ... 5000 mbar	160 bar	240 bar
	5 ... 500 kPa	16 MPa	24 MPa
	20.09 … 2009 inH_2O	2320 psi	3481 psi
	0.3 ... 30 bar	160 bar	240 bar
	0.03 ... 3 MPa	16 MPa	24 MPa
	4.35 … 435 psi	2320 psi	3481 psi
	2.5 ... 250 mbar	420 bar	630 bar
	0.25 ... 25 kPa	42 MPa	63 MPa
	1.005 … 100.5 inH_2O	6092 psi	9137 psi
	6 ... 600 mbar	420 bar	630 bar
	0.6 ... 60 kPa	42 MPa	63 MPa
	2.41 … 241.1 inH_2O	6092 psi	9137 psi
	16 ... 1600 mbar	420 bar	630 bar
	1.6 ... 160 kPa	42 MPa	63 MPa
	6.43 … 643 inH_2O	6092 psi	9137 psi
	50 ... 5000 mbar	420 bar	630 bar
	5 ... 500 kPa	42 MPa	63 MPa
	20.09 … 2009 inH_2O	6092 psi	9137 psi
	0.3 ... 30 bar	420 bar	630 bar
	0.03 ... 3 MPa	42 MPa	63 MPa
	4.35 … 435 psi	6092 psi	9137 psi

Measuring limits		
• Low measuring limit		
- Measuring cell with silicone oil filling	-100% of the maximum measuring span (-33% for measuring cell 30 bar/3 MPa/435 psi PN 420) or 30 mbar a /3 kPa a /0.44 psi a	
- Measuring cell with inert liquid		
	For temperature of medium -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)	-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a
	For temperature of medium 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar with PN 420) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))	-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a
		30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C 3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F
- Measuring cell with FDA-compliant oil	For temperature of medium -10 °C < ϑ ≤ +100 °C (-14 °F < ϑ ≤ +212 °F)	-100% of maximum measuring range or 100 mbar a /10 kPa a /14.5 psi a
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)	
• Lower range value	Between the measuring limits (infinitely adjustable)	

SITRANS P320 / SITRANS P420 for differential pressure and flow		
Output	**HART**	
Output signal	4 ... 20 mA	
• Low saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA	
• High saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA	
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current	
Adjustable damping	0 … 100 s, continuously adjustable over remote operation	
	0 … 100 s, in increments of 0.1 s, adjustable over display	
• Current transmitter	3.55 … 22.8 mA	
• Failure signal	3.55 … 22.8 mA	
Load	Resistor R [Ω]	
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V	
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld))	
	R = 230 … 500 Ω (SIMATIC PDM)	
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)	
Physical bus	-	
Polarity-independent	-	
Measuring accuracy		
Reference conditions	• According to EN 60770-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)	
Conformity error at limit point setting, including hysteresis and repeatability		
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range	
• Linear characteristic		
- 20 mbar/2 kPa/0.29 psi	r ≤ 5: 5 < r ≤ 20:	≤ 0.075% ≤ (0.005 · r + 0.05)%
- 60 mbar/6 kPa/0.87 psi	r ≤ 5: 5 < r ≤ 60:	≤ 0.075% ≤ (0.005 · r + 0.05)%
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5: 5 < r ≤ 100:	≤ 0.065% (SITRANS P320) ≤ (0.004 · r + 0.045)% (SITRANS P320)
- 250 mbar/25 kPa/3.63 psi (PN 160) 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5: 5 < r ≤ 100:	≤ 0.04% (SITRANS P420) ≤ (0.004 · r + 0.045)% (SITRANS P420)
- 250 mbar/25 kPa/3.63 psi (PN 420)	r ≤ 5:	≤ 0.065% (SITRANS P420)
• Square-rooted characteristic (flow > 50%)		
- 20 mbar/2 kPa/0.29 psi	r ≤ 5: 5 < r ≤ 20:	≤ 0.075% ≤ (0.005 · r + 0.05)%
- 60 mbar/6 kPa/0.87 psi	r ≤ 5: 5 < r ≤ 60:	≤ 0.075% ≤ (0.005 · r + 0.05)%
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5: 5 < r ≤ 100:	≤ 0.065% (SITRANS P320) ≤ 0.04% (SITRANS P420) ≤ (0.004 · r + 0.045)%
• Square-rooted characteristic (flow 25 ... 50%)		
- 20 mbar/2 kPa/0.29 psi	r ≤ 5: 5 < r ≤ 20:	≤ 0.15% ≤ (0.01 · r + 0.1)%
- 60 mbar/6 kPa/0.87 psi	r ≤ 5: 5 < r ≤ 60:	≤ 0.15% ≤ (0.01 · r + 0.1)%
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5: 5 < r ≤ 100:	≤ 0.13% (SITRANS P320) ≤ 0.08% (SITRANS P420) ≤ (0.008 · r + 0.09)%

SITRANS P320 / SITRANS P420 for differential pressure and flow	
Influence of ambient temperature (in % per 28 °C (50 °F))	
- 20 mbar/2 kPa/0.29 psi	≤ (0.15 · r + 0.1)%
- 60 mbar/6 kPa/0.87 psi	≤ (0.075 · r + 0.1)%
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	≤ (0.025 · r + 0.125)% (SITRANS P320)
- 250 mbar/25 kPa/3.63 psi 5 bar/500 kPa/72.5 psi	≤ (0.025 · r + 0.0625)% (SITRANS P420)
- 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 30 bar/3 MPa/435 psi	≤ (0.0125 · r + 0.0625)% (SITRANS P420)
Effect of static pressure	
• on the lower range value	Zero-point correction is possible with position error compensation
- 20 mbar/2 kPa/0.29 psi	≤ (0.3 · r)% per 70 bar (SITRANS P320) ≤ (0.2 · r)% per 70 bar (SITRANS P420)
- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 30 bar/3 MPa/435 psi	≤ (0.1 · r)% per 70 bar
- 5 bar/500 kPa/72.5 psi	≤ (0.15 · r)% per 70 bar
• on the measuring span	
- 20 mbar/2 kPa/0.29 psi	≤ 0.2% per 70 bar
- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	≤ 0.1% per 70 bar
Long-term stability at ±30 °C (±54 °F)	Static pressure max. 70 bar/7 MPa/1015 psi
• 20 mbar/2 kPa/0.29 psi	≤ (0.2 · r)% per year
• 60 mbar/6 kPa/0.87 psi	In 5 years ≤ (0.25 · r)%
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi	In 5 years ≤ (0.125 · r)% In 10 years ≤ (0.15 · r)%
• 30 bar/3 MPa/435 psi	In 5 years ≤ (0.25 · r)% In 10 years ≤ (0.35 · r)%
Step response time T_{63} (without electrical damping for pressure rating PN 1600)	
• 20 mbar/2 kPa/0.29 psi	Approx. 0.160 s
• 60 mbar/6 kPa/0.87 psi	Approx. 0.150 s
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	Approx. 0.135 s
Effect of mounting position (in pressure per change of angle)	≤ 0.7 mbar/0.07 kPa/0.028 inH_2O per 10° incline (zero point correction is possible with position error compensation)
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V

SITRANS P320 / SITRANS P420 for differential pressure and flow	
Operating conditions	
Temperature of medium	
• Measuring cell with silicone oil filling	-40 … +100 °C (-40 … +212 °F)
- Measuring cell 30 bar (435 psi)	-20 … +100 °C (-4 … +212 °F)
• Measuring cell with inert oil	-20 … +100 °C (-4 … +212 °F)
• Measuring cell with FDA-compliant oil	-10 … +100 °C (14 … +212 °F)
• In conjunction with dust explosion protection	-40 … +85 °C (-4 … +185 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in areas subject to explosion hazard.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil	-40 … +85 °C (-40… +185 °F)
- Measuring cell with FDA-compliant oil	-10 … +85 °C (14 … +185 °F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Design	
Weight	Approx. 3.9 kg (8.5 lb) with aluminum enclosure Approx. 5.8 kg (12.7 lb) with stainless steel enclosure
Material	
• Wetted parts materials	
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
- Process flanges and sealing plugs	Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel type plate (1.4404/316L)
- Pressure flange screws	Stainless steel ISO 3506-1 A4-70
- Mounting bracket	Steel, electrogalvanized steel, or stainless steel
Process connection	¼-18 NPT female thread and flat connection with 7/16-20 UNF fastening screw thread in accordance with EN 61518 or M10 fastening screw thread in accordance with DIN 19213 (M12 for PN 420 (MWP 6092 psi))
Electrical connection	Screw terminals Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Keys	4 keys for operation directly on the device
Display	• With or without integrated display (optional) • Cover with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode
Ripple	$U_{SS} \leq 0.2$ V (47 … 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–

SITRANS P320 / SITRANS P420 for differential pressure and flow	
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
	For flow only
	For gases of fluid group 1 and liquids of fluid group 1; fulfills the basic safety requirements as per article 3, paragraph 1 (appendix 1); classified as category III, module H conformity evaluation by TÜV Nord
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with the peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 to 30 V, 4 ... 20 mA

SITRANS P320 / SITRANS P420 for differential pressure and flow	
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	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
• Explosion protection according to CSA	Available soon
- Marking (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
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

HART communication	
HART	230 ... 1100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

Selection and ordering data

	Article No.
Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)	
SITRANS P320 ↗	**7MF034 - ■■■■■ - ■■■■**
SITRANS P420 ↗	**7MF044 - ■■■■■ - ■■■■**
↗ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
Measuring cell filling	
Silicone oil	**1**
Inert liquid	**3**
Neobee oil	**4**
Maximum measuring span	
20 mbar (8.037 inH_2O)	**B**
60 mbar (24.11 inH_2O)	**D**
250 mbar (100.5 inH_2O)	**G**
600 mbar (241.1 inH_2O)	**H**
1 600 mbar (643 inH_2O)	**M**
5000 mbar (2009 inH_2O)	**P**
30 bar (435 psi)	**R**
Process connection	
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518)	**L**
Oval flange, mounting thread: M10 (PN 160) (DIN 19213)	**M**
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation	**N**
Oval flange, mounting thread: M10 (PN 160) (DIN 19213) with lateral ventilation	**P**
Version for diaphragm seal with mounting thread $^7/_{16}$-20 UNF (IEC 61518)	**V**
Version for diaphragm seal with mounting thread M10 (DIN 19213)	**W**
Version for diaphragm seal (level and capillary) with mounting thread $^7/_{16}$-20 UNF (IEC 61518)	**X**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	**1**
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408	**2**
Tantalum/tantalum, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**4**
Monel 00/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**6**
Stainless steel 316L/1.4404, gold-plated, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**8**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**

	Article No.
Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)	
SITRANS P320	**7MF034** ■ - ■■■■■ - ■■■
SITRANS P420	**7MF044** ■ - ■■■■■ - ■■■
Local operation/display	
Without display (cover closed)	**0**
With display (cover closed)	**1**
With display (cover with glass pane)	**2**

1

for differential pressure and flow

	Article No.
Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)	
SITRANS P320 ↗	**7MF035 - ■■■■■ - ■■■■**
SITRANS P420 ↗	**7MF045 - ■■■■■ - ■■■■**
↗ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
Measuring cell filling	
Silicone oil	**1**
Inert liquid	**3**
Neobee oil	**4**
Maximum measuring span	
250 mbar (100.5 inH_2O)	**G**
600 mbar (241.1 inH_2O)	**H**
1 600 mbar (643 inH_2O)	**M**
5000 mbar (2009 inH_2O)	**P**
30 bar (435 psi)	**R**
Process connection	
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518)	**L**
Oval flange, mounting thread: M12 (PN 420) (DIN 19213)	**M**
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation	**N**
Oval flange, mounting thread: M12 (PN 420) (DIN 19213) with lateral ventilation	**P**
Version for diaphragm seal with mounting thread $^7/_{16}$-20 UNF (IEC 61518)	**V**
Version for diaphragm seal with mounting thread M10 (DIN 19213)	**W**
Version for diaphragm seal (level and capillary) with mounting thread $^7/_{16}$-20 UNF (IEC 61518)	**X**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	**1**
Stainless steel 316L/1.4404, gold-plated, process flange stainless steel 316/1.4408	**8**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (cover closed)	**0**
With display (cover closed)	**1**
With display (cover with glass pane)	**2**

Selection and ordering data

Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/connector mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/connector mounted left	**A97**
Cable gland/connector mounted on right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009))	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	**D20**
FVMQ enclosure sealing	**D21**
IP66/IP68 degree of protection (not for device plugs M12 and Han)	**D30**
TAG label empty	**D40**
Without labeling of the measuring range on the TAG label	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Increase of pressure stage from PN 420 to PN 500 (tested according to IEC 61010. Only permissible for media of fluid group 2 acc. to DGRL. Not suitable for use with hazardous media.))	**D50**
Overvoltage protection up to 6 kV (external)	**D71**
Adhesive labels on transport packaging (supplied by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Export approval CPA (China)	**E12**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)	**E21**
FM (USA and Canada)	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**

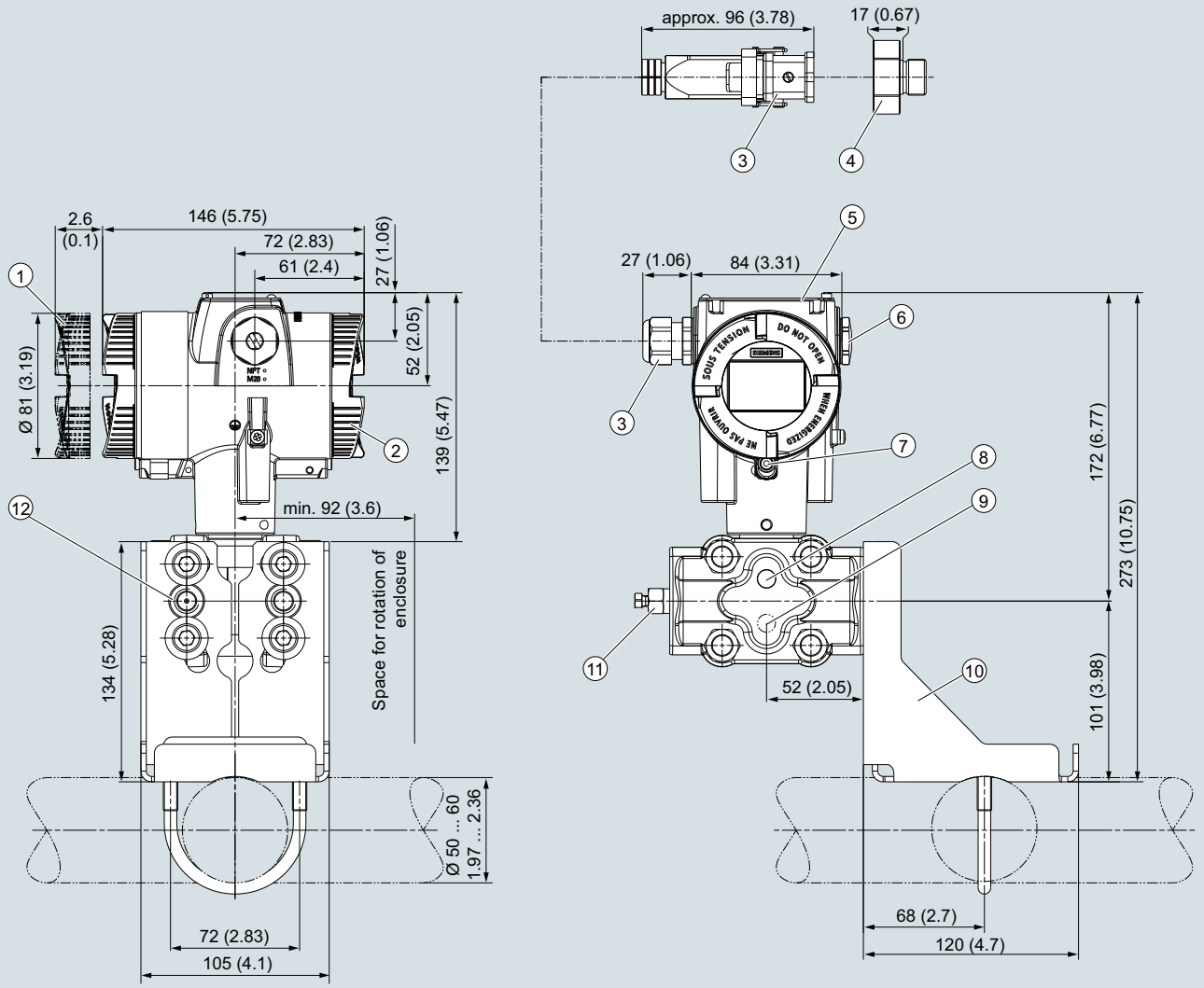
for differential pressure and flow

Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual seal	**E81**
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Mounting bracket	
Steel, galvanized	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Process flanges; screw plug with vent valve	
Welded in on right	**J08**
Welded in on left	**J09**
Glued in on right	**J10**
Glued in on left	**J11**
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J70**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J71**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J72**
• DN 15 PN 40, stainless steel 1.4571/316Ti	**J78**
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J73**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J74**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J75**
Flange connection options	
Flange connection and temperature extension	**J76**
Flange connection with epoxy resin coating	**J77**
Process flanges; special materials	
Reserved for 7MF7: without process flanges, without screws, without gaskets	**K00**
Process flange material alloy C22/2.4602	**K01**
Process flange material Monel 400/2.4360	**K02**
Process connection material PVDF, on the side ½-14 NPT	**K05**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	**K06**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	**K07**
Process flanges; process connection option	
Process flange with process connection G½ welded on	**K20**
Process connection NAM (ASTAVA)	**K21**
Process flanges chambered with gaskets	
1x chambered, graphite	**K40**
1x chambered, PTFE	**K41**
2x chambered, PTFE	**K42**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE	**K50**
O-ring, process flanges, FEP (with silicone core, approved for food)	**K51**
O-ring, process flanges, FFKM (FFPM)	**K52**
O-ring, process flanges, NBR	**K53**
O-ring, process flanges, EPDM	**K54**

Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	**K81**
Process flanges (+) - side front	**K82**
Process flange screws, process flange nuts, material Monel 400/2.4360	**K83**
Valve ¼-18 NPT, material same as process flanges	**K84**
Valve mounted on the side, measured medium: Gas	**K85**
Oval flange enclosed, gasket PTFE + mounting screws	**K86**
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U01**
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U02**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U03**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U04**

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, inHg, atm, torr	**Y01**
Square-rooted characteristic [VSLN2, MSLN2], example: VSLN2 Drop-down list: VSLN2, MSLN2	**Y02**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... . 5 m^3/s Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl, m^3/sec, m^3/h, m^3/d, l/sec, l/min, l/h, Ml/d, ft^3/sec, ft^3/h, ft^3/d, SCF/min, SCF/h, Nl/h, Nm^3/h, gal/sec, gal/min, gal/h, gal/d, Mgal/d, gal (UK)/sec, gal (UK)/min, gal (UK)/h, gal (UK)/d, bbl/sec, bbl/min, bbl/h, bbl/d, kg/sec, kg/min, kg/h, kg/d, g/sec, g/min, g/h, t/min, t/h, t/d, lb/sec, lb/min, lb/h, lb/d, ton/min, ton/h, ton/d, ton (UK)/h, ton (UK)/d.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special version Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

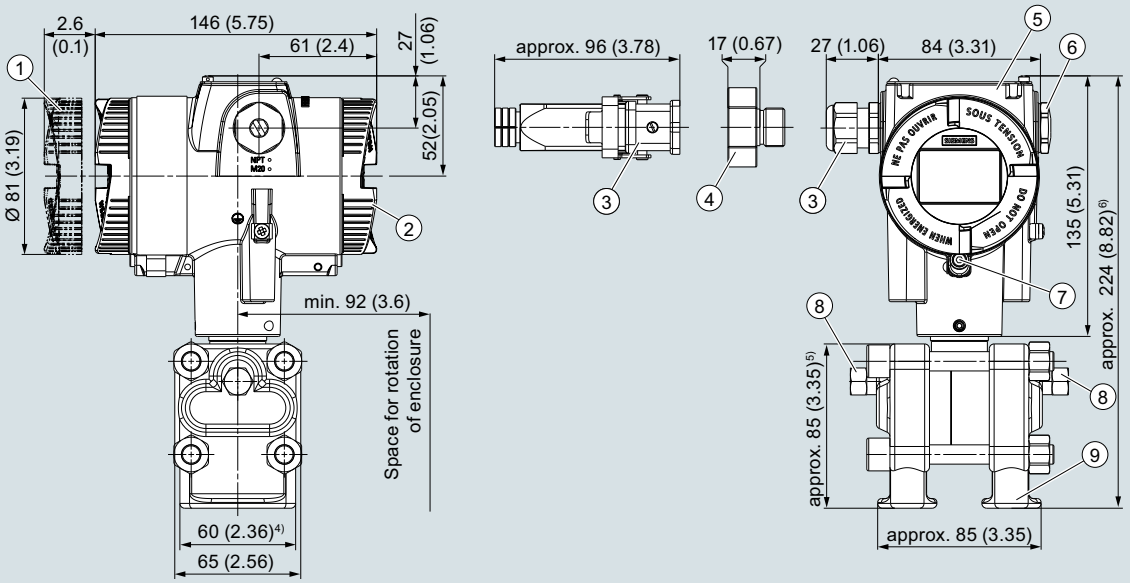
Dimensional drawings



1. Electronics side, local display (longer overall length for cover with glass pane)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2][3] device plug
   - M12 device plug[2][3]
4. Harting adapter
5. Cover over buttons and nameplate with general information
6. Blanking plug
7. Safety catch (only for "flameproof enclosure" type of protection)
8. Lateral ventilation for liquid measurement (Standard)
9. Lateral ventilation for gas measurement (order option K85)
10. Mounting bracket (optional)
11. Sealing plug with valve (optional)
12. Process connection: ¼-18 NPT (IEC 61518)

[1] In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for differential pressure and flow, dimensions in mm (inch)



1. Electronics side, local display
   (longer overall length for cover with inspection window)[1]
2. Connection side
3. Electrical connection:
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] device plug
   - M12 device plug[2] [3]
4. Harting adapter
5. Cover over buttons and nameplate
   with general information
6. Blanking plug
7. Safety catch
   (only for "flameproof enclosure" type of protection)
8. Sealing plug with valve (option)
9. Process connection: ¼-18 NPT (IEC 61518)

1) In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"
4) 74 mm (2.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
5) 91 mm (3.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
6) 226 mm (8.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

SITRANS P320/P420 pressure transmitter for differential pressure and flow with process covers for vertical differential pressure lines (option "K81"), dimensions in mm (inch)

Technical specifications

SITRANS P320 / SITRANS P420 for level			
Input			
Measured variable	Level		
Measuring span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	25 ... 250 mbar	See "Mounting flange"	
	2.5 ... 25 kPa		
	10 … 100.5 inH_2O		
	25 ... 600 mbar		
	2.5 ... 60 kPa		
	10 … 241 inH_2O		
	53 ... 1600 mbar		
	5.3 ... 160 kPa		
	21 … 643 inH_2O		
	166 ... 5000 mbar		
	16.6 ... 500 kPa		
	2.41 … 72.5 psi		
Measuring limits			
• Low measuring limit			
- Measuring cell with silicone oil filling	-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange		
- Measuring cell with inert oil	-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange		
- Measuring cell with FDA-compliant oil	-100% of max. measuring range or 100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of max. measuring span		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	**HART**		
Output signal	4 ... 20 mA		
• Low saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA		
• High saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA		
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current		
Adjustable damping	0 … 100 s, continuously adjustable over remote operation		
	0 … 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 … 22.8 mA		
• Failure signal	3.55 … 22.8 mA		
Load	Resistor R [Ω]		
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V		
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld))		
	R = 230 … 500 Ω (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		
Measuring accuracy			
Reference conditions	• According to EN 60770-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)		
Conformity error at limit point setting, including hysteresis and repeatability			
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range		
• Linear characteristic			
- 250 mbar/25 kPa/3.6 psi - 600 mbar/60 kPa/8.7 psi - 1600 mbar/160 kPa/23.21 psi - 5 bar/500 kPa/72.5 psi	r ≤ 5: 5 < r ≤ 10:	≤ 0.125% ≤ (0.007 · r + 0.09)%	

SITRANS P320 / SITRANS P420 for level	
Influence of ambient temperature in % per 28 °C (50 °F)	
• SITRANS P320	≤ (0.025 · r + 0.125)%
- 250 mbar/25 kPa/3.6 psi - 600 mbar/60 kPa/8.7 psi - 1600 mbar/160 kPa/23.21 psi - 5 bar/500 kPa/72.5 psi	
• SITRANS P420	≤ (0.025 · r + 0.0625)%
- 250 mbar/25 kPa/3.6 psi - 5 bar/500 kPa/72.5 psi	
- 600 mbar/60 kPa/8.7 psi - 1600 mbar/160 kPa/23.21 psi	≤ (0.125 · r + 0.0625)%
Effect of static pressure	
• on the lower range value	
- 250 mbar/25 kPa/3.63 psi	≤ (0.3 · r)% per nominal pressure
- 600 mbar/60 kPa/8.70 psi 1.6 bar/160 kPa/23.21 psi 5 bar/500 kPa/72.52 psi	≤ (0.15 · r)% per nominal pressure
• on the measuring span	≤ (0.1 · r)% per nominal pressure
Long-term stability at ±30 °C (±54 °F)	
• all measuring cells	In 5 years ≤ (0.25 · r)% static pressure max. 70 bar/7 MPa/1015 psi
Step response time T_{63} (without electrical damping)	Depending on the installed remote seal
Influence of mounting position	Depends on the fill fluid in the mounting flange
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V
Operating conditions	
Temperature of medium	
Measuring cell with silicone oil filling	• High-pressure side: See "Mounting flange" • Low-pressure side: -40 … +100 °C (-40 … +212 °F)
Ambient conditions	
• Ambient temperature/enclosure	Always consider the assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Vibration resistance	
• Reference conditions	Specifications apply to devices without mounting bracket
• General operating conditions	
- Oscillations (sine) IEC 60068-2-6	10 ... 58 Hz, 0.3 mm (0.01 inch) 58 ... 500 Hz, 20 m/s² (65.62 ft/s²) 1 octave/min 5 cycles/axis
- Continuous shocks (half-sine) IEC 60068-2-27	250 m/s² (820 ft/s²) 6 ms 2000 shocks/axis
- Noise (digitally controlled) IEC 60068-2-64	10 ... 200 Hz; 1 $(m/s^2)^2$/Hz (3.28 $(ft/s^2)^2$/Hz) 200 ... 500 Hz; 0.3 $(m/s^2)^2$/Hz (0.98 $(ft/s^2)^2$/Hz) 4 hours/axle
• Operating conditions for marine applications	
- IEC 60068-2-6 - DNVGL-CG-0339, clause 6 - Lloyd's Register Test Specification Number 1, section 12. - Bureau Veritas Pt C, Ch 3, Sec 6, Table 1, No 7	2 ... 25 Hz, 1.6 mm (0.06 inch) 25 ... 100 Hz, 40 m/s² (131.23 ft/s²) 1 octave/min

SITRANS P320 / SITRANS P420 for level		
Design		
Weight		
• According to EN (pressure transmitter with mounting flange, without tube)		
• According to ASME (pressure transmitter with mounting flange, without tube)		
Material		
• Wetted parts materials		
- High-pressure side	Seal diaphragm of mounting flange	Stainless steel, mat. no. 1.4404/316L, Monel 400, mat. no. 2.4360, Alloy B2, mat. no. 2.4617, Alloy C276, mat. no. 2.4819, Alloy C22, mat. no. 2.4602, tantalum, PTFE, PFA, ECTFE
	Sealing surface	Smooth according to EN 1092-1, form B1 or ASME B16.5 RF 125 … 250 AA for stainless steel 316L, EN 2092-1 form B2 or ASME B16.5 RFSF for the remaining materials
- Sealing material in the process flanges	For standard applications	Viton
	For underpressure applications on the mounting flange	Copper
- Low-pressure side	Seal diaphragm	Stainless steel, mat. no. 1.4404/316L
	Process flanges	Stainless steel, mat. no. 1.4408/316
	Process flanges screw	Stainless steel ISO 3506-1 A4-70
	O-ring	FPM (Viton)
• Non-wetted parts materials		
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel type plate (1.4404/316L)	
Pressure flange screws	Stainless steel ISO 3506-1 A4-70	
Measuring cell filling	Silicone oil	
• Mounting flange fill fluid	Silicone oil or other material	
Process connection		
• High-pressure side	Flange according to EN and ASME	
• Low-pressure side	¼-18 NPT female thread and flat connection with M10 fastening screw thread in accordance with DIN 19213 (M12 for PN 420 (MWP 6092 psi)) or 7/16-20 UNF in accordance with EN 61518	
Electrical connection	Screw terminals	
	Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12	
Displays and controls		
Keys	4 keys for operation directly on the device	
Display	• With or without integrated display (optional) • Cover with inspection window (optional)	
Auxiliary power U_H		
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode	
Ripple	U_{SS} ≤ 0.2 V (47 … 125 Hz)	
Noise	U_{eff} ≤ 1.2 mV (0.5 … 10 kHz)	
Auxiliary power	–	
Separate supply voltage	–	

SITRANS P320 / SITRANS P420 for level	
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for zones 20, 21, 22	
- Marking	Ex II 1D Ex tb IIIC T120 °C Da Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: U_n = 10.5 to 45 V, 4 ... 20 mA
• Dust explosion protection for zones 21, 22	
- Marking	Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with the peak values: U_i = 30 V, I_i = 101 mA, P_i = 760 mW U_i = 29 V, I_i = 110 mA, P_i = 800 mW
- Effective internal inductance/capacitance	L_i = 0.24 µH/C_i = 3.29 nF
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: U_n = 10.5 to 30 V, 4 ... 20 mA

for level

SITRANS P320 / SITRANS P420 for level	
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	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
• Explosion protection according to CSA	Available soon
- Marking (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
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

[1] Han 8D is identical to Han 8U.

HART communication	
HART	230 ... 1100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

Mounting flange	
Nominal diameter	Nominal pressure
• Acc. to EN 1092-1	
- DN 80	PN 40
- DN100	PN 16, PN 40
• According to ASME B16.5	
- 3 inch	Class 150, class 300
- 4 inch	Class 150, class 300

Selection and ordering data

	Article No.
Pressure transmitters for level	
SITRANS P320 ↗	**7MF0 3 6 ▪ - ▪▪▪▪ - ▪▪▪▪**
SITRANS P420 ↗	**7MF0 4 6 ▪ - ▪▪▪▪ - ▪▪▪▪**
↗ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
Measuring cell filling	
Silicone oil	**1**
Maximum measuring span	
250 mbar (100.5 inH_2O)	**G**
600 mbar (241 inH_2O)	**H**
1 600 mbar (643 inH_2O)	**M**
5000 mbar (72.5 psi)	**P**
Process connection	
Version for diaphragm seal with mounting thread $^7/_{16}$-20 UNF (IEC 61518): Remote seal 7MF0814 must be ordered separately.	**V**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	**0**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Intrinsic safety	**B**
Flameproof enclosure	**C**
Flameproof enclosure, intrinsic safety	**D**
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	**L**
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	**M**
Combination of options B, C and L (zone model)	**S**
Combination of options B, C and M (zone model, Class Division)	**T**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx) • 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (cover closed)	**0**
With display (cover closed)	**1**
With display (cover with glass pane)	**2**

Selection and ordering data

Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable entry/connector mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/connector mounted left	**A97**
Cable gland/connector mounted on right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009))	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional safety (IEC 61508) - SIL2/3	**C20**

Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	**D20**
FVMQ enclosure sealing	**D21**
IP66/IP68 degree of protection (not for device plugs M12 and Han)	**D30**
TAG label empty	**D40**
Without labeling of the measuring range on the TAG label	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (external)	**D71**
Adhesive labels on transport packaging (supplied by customer)	**D90**
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	**E00**
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	**E01**
CSA (USA and Canada)	**E06**
EAC	**E07**
FM	**E08**
KCC	**E09**
Export approval CPA (China)	**E12**
Explosion protection approvals	
ATEX (Europe)	**E20**
CSA (USA and Canada)	**E21**
FM (USA and Canada)	**E22**
IECEx (Worldwide)	**E23**
EACEx (GOST-R, -K, -B)	**E24**
INMETRO (Brazil)	**E25**
KCs (Korea)	**E26**
NEPSI (China)	**E27**
PESO (India)	**E28**
UKR Sepro (Ukraine)	**E30**
ATEX (Europe) and IECEx (Worldwide)	**E47**
CSA (Canada) and FM (USA)	**E48**
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	**E49**
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	**E50**
LR (Lloyds Register)	**E51**
BV (Bureau Veritas)	**E52**
ABS (American Bureau of Shipping)	**E53**
RMR (Russian Maritime Register)	**E55**
KR (Korean Register of Shipping)	**E56**
RINA (Registro Italiano Navale)	**E57**
CCS (China Classification Society)	**E58**
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	**E60**

Options	Order code
Append "-**Z**" to Article No., add order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	**E80**
Dual seal	**E81**
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	**E83**
NSF61 (drinking water)	**E84**
ACS (drinking water)	**E85**
Device settings	
Measuring span Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, inHg, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special version Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

for level

Selection and Ordering data		Article No.	Order code
Diaphragm seal ↗		7MF0814-	
Flange type design, direct connected to a SITRANS P transmitter for level 7MF03../7MF04.. (order separately) Scope of delivery: 1 off		■■■03-0■■■	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Connecting standard EN 1092-1			
Nominal diameter	**Nominal pressure**		
DN 40	PN 10/16/25/40	0DD	
	PN 63/100	0DF	
	PN 160	0DG	
DN 50	PN 10/16/25/40	0ED	
	PN 63/100	0EE	
	PN 160	0EF	
DN 80	PN 10/16/25/40	0GD	
	PN 100	0GF	
DN 100	PN 10/16	0HB	
	PN 25/40	0HD	
DN 125	PN 16	0JB	
	PN 40	0JD	
Connecting standard ASME B16.5			
Nominal diameter	**Nominal pressure**		
1½ inch	class 150	1LA	
	class 300	1LB	
	class 400/600	1LD	
	class 900/1500	1LF	
2 inch	class 150	1MA	
	class 300	1MB	
	class 400/600	1MD	
	class 900/1500	1MF	
3 inch	class 150	1PA	
	class 300	1PB	
	class 600	1PD	
	class 1500	1PF	
4 inch	class 150	1QA	
	class 300	1QB	
	class 400	1QD	
	class 1500	1QF	
5 inch	class 150	1RA	
	class 300	1RB	
	class 400	1RC	
Connecting standard J.I.S.			
Nominal diameter	**Nominal pressure**		
DN 50	10K	2ES	
	20k	2ET	
	50K	2EU	
DN 80	10K	2GS	
	20k	2GT	
	50K	2GU	
DN 100	10K	2HS	
	20k	2HT	
	50K	2HU	
Other version Add Order code and plain text		9AA	H1Y

Selection and Ordering data	Article No.	Order code
Diaphragm seal	7MF0814-	
Flange type design, direct connected to a SITRANS P transmitter for level 7MF03../7MF04.. (order separately) Scope of delivery: 1 off	■■■03-0■■■	■■■
Filling liquid		
Silicone oil M5	A	
Silicone oil M50	B	
High-temperature oil	C	
Halocarbon oil	D	
Food-grade oil (FDA listed)	E	
Other version, add Order code and plain text: Filling liquid: ...	Z	P1Y
Wetted parts materials		
Stainless steel 316L		
• Without coating	A	
• With PFA coating	D	
• With PTFE coating	E	0
• With ECTFFE coating	F	
Monel 400, 2.4360	G	
Hastelloy C276, 2.4819	J	
Tantalum	K	
Titanium, 3.7035	L	0
Nickel 201	M	0
Diaphragm Duplex, 1.4462	Q	
Diaphragm plus flange Duplex, 1.4462	R	
Stainless steel 316L with gold coating	S	0
Hastelloy C4, 2.4610	U	0
Hastelloy C22, 2.4602	V	0
Other version Add Order code and plain text	Z	8 Q1Y
Extension length		
• without	0	
• 50 mm (2")	1	
• 100 mm (4")	2	
• 150 mm (6")	3	
• 200 mm (8")	4	
• 250 mm (10")	5	
Other version Add Order code and plain text	Z	8 Q1Y

Selection and Ordering data	Article No.	Order code
Diaphragm seal	7MF0814-	
Flange type design, direct connected to a SITRANS P transmitter for level 7MF03../7MF04.. (order separately) Scope of delivery: 1 off	03-0	
Customer-specific extension length		
Wetted parts stainless steel without coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		A 1
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		A 2
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		A 3
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		A 4
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		A 5
Wetted parts stainless steel with ECTFE coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		F 1
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		F 2
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		F 3
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		F 4
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		F 5
Wetted parts stainless steel with PFA coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		D 1
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		D 2
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		D 3
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		D 4
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		D 5
• Wetted parts Monel 400		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		G 1
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		G 2
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		G 3
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		G 4
• Wetted parts Hastelloy C276		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		J 1
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		J 2
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		J 3
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		J 4

Selection and Ordering data	Article No.	Order code
Diaphragm seal	7MF0814-	
Flange type design, direct connected to a SITRANS P transmitter for level 7MF03../7MF04.. (order separately) Scope of delivery: 1 off	03-0	
• Wetted parts Tantalum		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		K 1
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		K 2
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		K 3
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		K 4

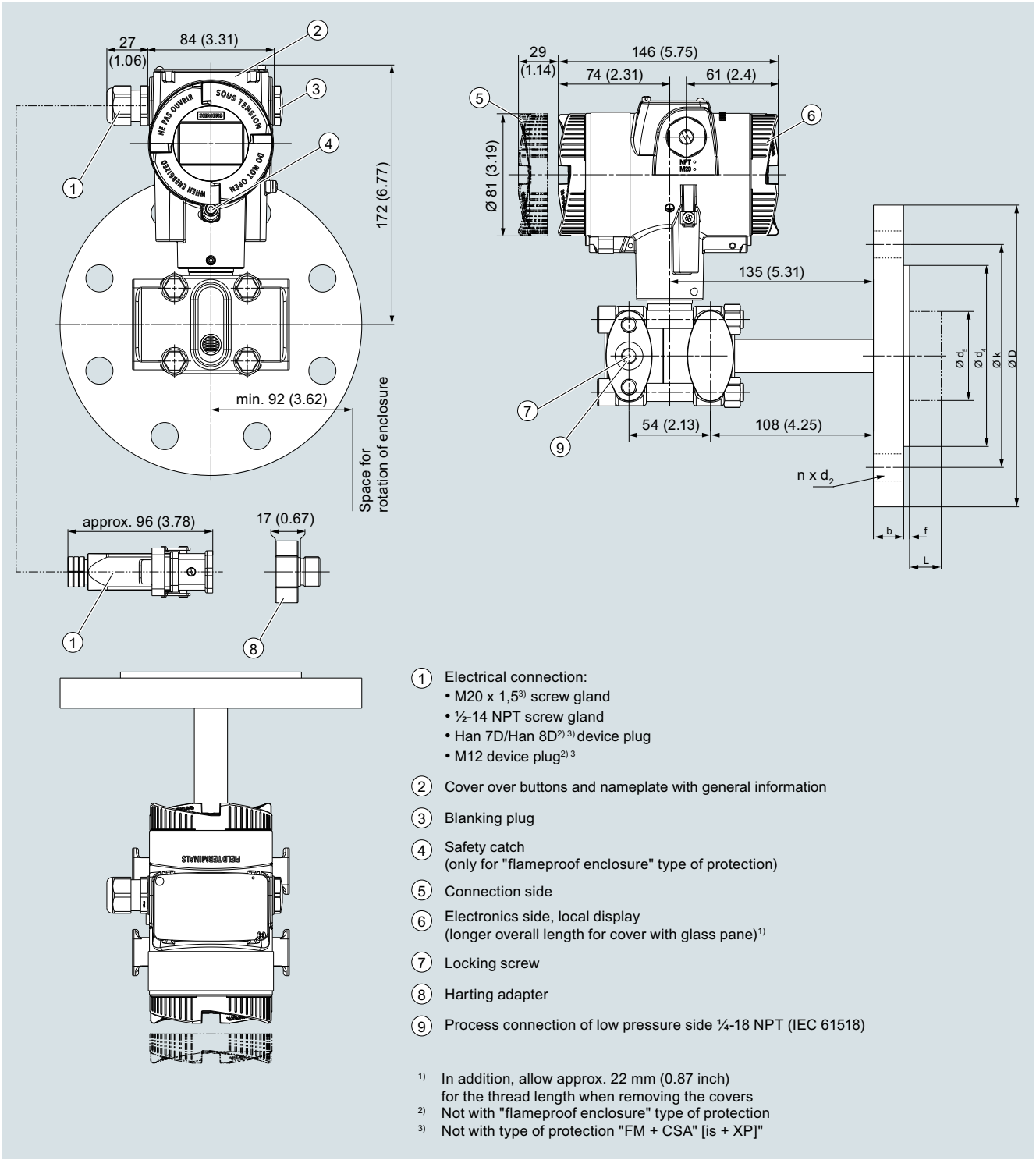
for level

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Factory certificates	
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**
Inspection certificate according to EN 10204-3.1 for main body and diaphragm	**C12**
Manufacturer code according to NACE (MR 0103-2012 and MR 0175-2009) (only in combination with wetted parts made of stainless steel 316 L and Hastelloy)	**C13**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Factory certificate on the FDA listing of the oil according to EN 10204-2.2	**C17**
Factory certificate functional safety (SIL2/3), suitability of devices for use according to IEC 61508 and IEC 61511 (contains SIL declaration of conformity)	**C20**
Accessories	
Spark arrestor (for differential pressure and level transmitter)	**D62**
Low-temperature version (for Silicon Oil M50 only)	**D67**
Negative pressure services	
Negative pressure service (for differential pressure transmitters)	**D83**
Extended negative pressure services (for differential pressure transmitters)	**D88**
General product approvals without explosion proof approvals	
Oil-and grease-free cleaned version (for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-and grease-free cleaned version (not for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)	**E87**
Sealing surface	
Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)	**M50**
Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)	**M54**
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)	**M64**
Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)	
• DN 40	**M71**
• DN 50	**M72**
• DN 80	**M73**
• DN 100	**M74**
• DN 125	**M75**
Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)	
• DN 40	**M77**
• DN 50	**M78**
• DN 80	**M79**
• DN 100	**M80**
• DN 125	**M81**
Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)	
• DN 50	**M84**
• DN 80	**M85**
• DN 100	**M86**
• DN 125	**M87**

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Remote seal connection	
Elongated pipe, 150 mm (5.9 inch) instead of 100 mm (3.9 inch)	**S05**
Elongated pipe, 200 mm (7.9 inch) instead of 100 mm (3.9 inch)	**S06**
Customer-specific tube length	
Customer-specific tube length (specify in plain text)	**Y44**
Specification of process conditions[1)]	
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

1) See also "Specification of process conditions for selection and ordering data", page 1/337.

Dimensional drawings



1. Electrical connection:
   - M20 x 1,5[3] screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] device plug
   - M12 device plug[2] [3]
2. Cover over buttons and nameplate with general information
3. Blanking plug
4. Safety catch
   (only for "flameproof enclosure" type of protection)
5. Connection side
6. Electronics side, local display
   (longer overall length for cover with glass pane)[1]
7. Locking screw
8. Harting adapter
9. Process connection of low pressure side ¼-18 NPT (IEC 61518)

[1] In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

SITRANS P320/P420 pressure transmitter for level, including mounting flange, dimensions in mm (inch)

for level

Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 40	PN 10/16/ 25/40	16	150	18	88	38	30	42	2	110	4	0, 50, 100, 150 or 200
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/ 25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/ 25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

Connection according to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	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)		inch (mm)
1½ inch	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	
	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	
2 inch	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3 inch	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4 inch	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5 inch	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

Process connection according to J.I.S

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with tube	d_M without tube	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)		mm (inch)
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 or 200 (0, 2, 3.94, 5.94 or 7.87)
	20K	16 (0.63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Internal diameter of seal according to DIN 2690

d_M: Effective diaphragm diameter

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 measuring spans from 0.01 bar to 700 bar (0.15 psi to 10153 psi) for DS III with HART interface
- Nominal measuring range from 1 bar to 700 bar (14.5 psi to 10153 psi) for DS III with PROFIBUS PA and FOUNDATION Fieldbus interface
- 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 programmed locally using the 3 control buttons or 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.

Measuring span (infinitely adjustable)
for DS III with HART: 0.01 bar to 700 bar (0.15 psi to 10153 psi)

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

Pressure transmitters for absolute pressure

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

Measuring span (infinitely adjustable)
for DS III with HART: 8.3 mbar a ... 100 bar a (0.12 ... 1450 psi a)

Nominal measuring range
for DS III with PROFIBUS PA and FOUNDATION Fieldbus:
250 mbar a ... 100 bar a (3.6 ... 1450 psi 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"))

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

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

Pressure transmitters for level

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

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

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

Nominal diameter of the mounting flange

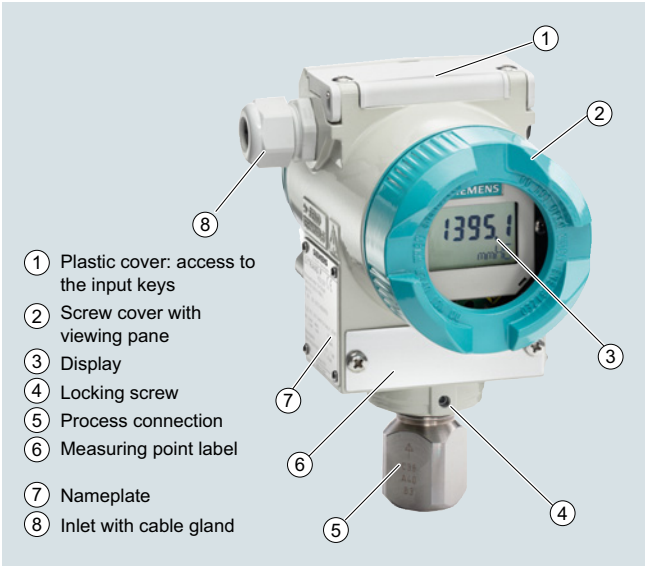
- DN 80 or DN 100
- 3 inch or 4 inch

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

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

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

Design



Front view

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

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

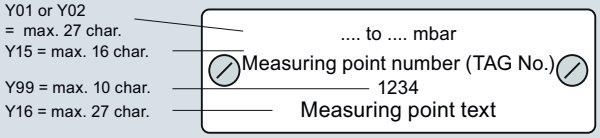
The approval label is located on the opposite side.

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

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the enclosure 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.

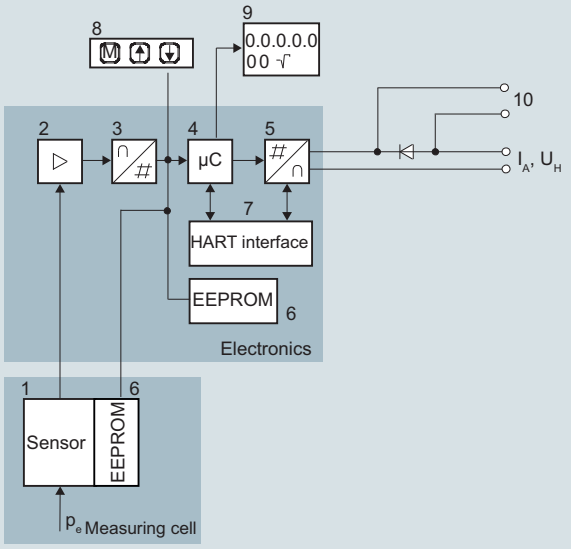
At the top of the enclosure is a plastic cover (1), which hides the input keys.

Example for an attached measuring point label



Function

Operation of electronics with HART communication



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

Function diagram of electronics

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

The diode circuit (10) protects against incorrect polarity.

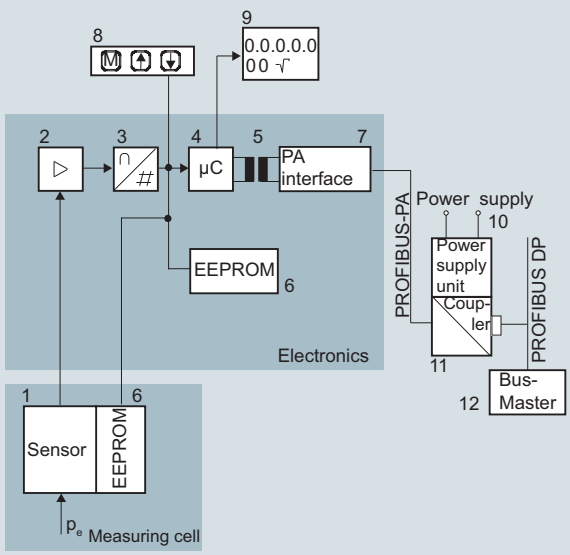
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

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

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

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

Operation of electronics with PROFIBUS PA communication



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

Function diagram of electronics

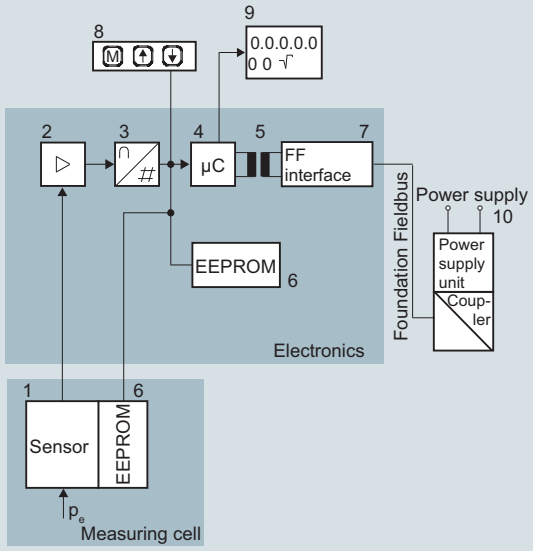
The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected,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

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

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

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

Operation of electronics with FOUNDATION Fieldbus communication



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

Function diagram of electronics

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

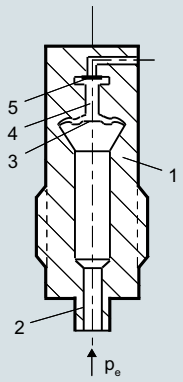
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

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

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

Mode of operation of the measuring cells

Measuring cell for gauge pressure

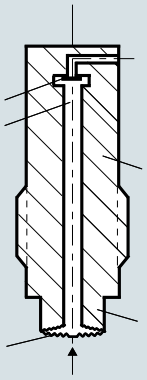


1	Measuring cell
2	Process connection
3	Seal diaphragm
4	Filling liquid
5	Silicon pressure sensor
p_e	Pressure as input variable

Measuring cell for gauge pressure, function diagram

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

Measuring cell for gauge pressure with front-flush diaphragm

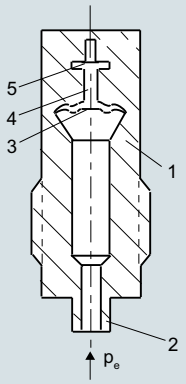


1	Measuring cell
2	Process connection
3	Seal diaphragm
4	Filling liquid
5	Silicon pressure sensor
p_e	Pressure as input variable

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

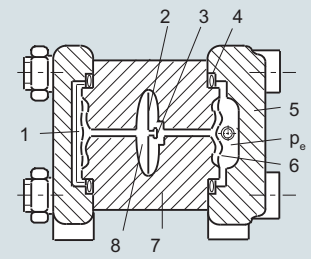


1 Measuring cell
2 Process connection
3 Seal diaphragm
4 Filling liquid
5 Silicon absolute pressure sensor
p_e Absolute pressure as input variable

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

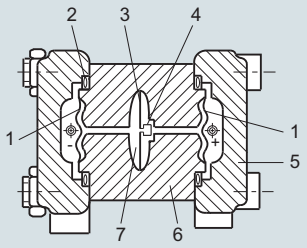
Measuring cell for absolute pressure from differential pressure series, function diagram

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

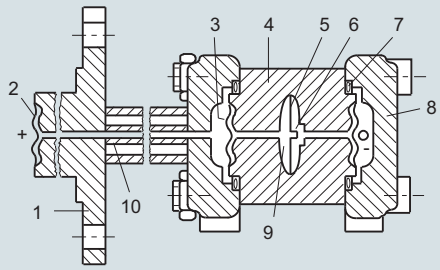
Measuring cell for differential pressure and flow, function diagram

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 differential pressure.

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

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 (5) is flexed until the seal diaphragm rests on the body of the measuring cell (4), thus protecting the silicon pressure sensor from overloads.

Parameterization DS III

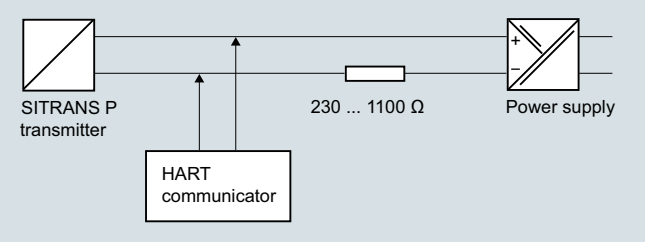
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

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

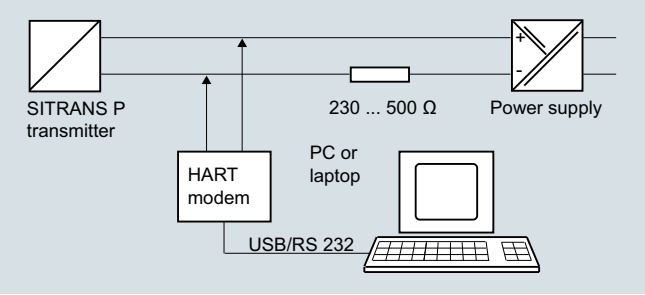
Parameterization using HART

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



Communication between a HART Communicator and a pressure transmitter

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



HART communication between a PC communicator and a pressure transmitter

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

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

Adjustable parameters, DS III with HART

Parameters	Input keys (DS III HART)	HART communication
Lower range value	x	x
Upper range value	x	x
Electrical damping	x	x
Lower range value without application of a pressure ("Blind setting")	x	x
Upper range value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
Current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x[1)]
Type of dimension and actual dimension	x	x
Characteristic (linear / square-rooted)	x[2)]	x[2)]
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

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

Diagnostic functions for DS III with HART

- Zero correction display
- Event counter
- Limit transmitter
- Saturation alarm
- Slave pointer
- 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_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
volume flow	m^3/d, m^3/h, m^3/s, l/min, l/s, ft^3/d, ft^3/min, ft^3/s, US gallon/min, US gallon/s
Mass flow	t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/d, g/h, g/min, g/s, lb/d, lb/h, lb/min, lb/s, LTon/d, LTon/h, STon/d, STon/h, STon/min
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

Parameterization through PROFIBUS PA interface

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

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

Parameterization through FOUNDATION Fieldbus interface

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

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

Adjustable parameters for DS III with PROFIBUS PA and FOUNDATION Fieldbus

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

Technical description

Diagnostic functions for DS III with PROFIBUS PA and FOUNDATION Fieldbus

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

Physical dimensions available for the display

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

Technical specifications

SITRANS P, DS III series for gauge pressure

Input

Measured variable	Gauge pressure			
Measuring span (fully adjustable) or nominal measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**		
(for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	8.3 ... 250 mbar 0.83 ... 25 kPa 0.12 ... 3.6 psi	250 mbar 25 kPa 3.6 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 psi	10 bar 1 MPa 145 psi
	0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
	0.63 ... 63 bar 63 ... 6300 kPa 9.1 ... 914 psi	63 bar 6300 kPa 914 psi	67 bar 6.7 MPa 972 psi	100 bar 10 MPa 1450 psi
	1.6 ... 160 bar 0.16 ... 16 MPa 23 ... 2321 psi	160 bar 16 MPa 2321 psi	167 bar 16.7 MPa 2422 psi	250 bar 25 MPa 3626 psi
	4 ... 400 bar 0.4 ... 40 MPa 58 ... 5802 psi	400 bar 40 MPa 5802 psi	400 bar 40 MPa 5802 psi	600 bar 60 MPa 8702 psi
	7 ... 700 bar 0.7 ... 70 MPa 102 ... 10153 psi	700 bar 70 MPa 10153 psi	800 bar 80 MPa 11603 psi	800 bar 80 MPa 11603 psi
Lower measuring limit (for 250mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant upt to 30 mbar a/3 kPa a/0.44 psi a.)				
• Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a			
• Measuring cell with inert filling liquid	30 mbar a/3 kPa a/0.44 psi a			
Upper measuring limit	100% of max. measuring span (max. 100 bar/10 MPa/1450 psi for oxygen measurement) ambient temperature/temperature of medium 60 °C (140 °F)			

Output	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-
Load		
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V	-
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) bzw. R_B = 230 ... 1100 Ω (HART-Communicator)	-
Physical bus	-	IEC 61158-2
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.	
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)	

for gauge pressure

SITRANS P, DS III series for gauge pressure	
Measuring accuracy	Acc. to IEC 60770-1
Reference conditions	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Silicone oil filling • Room temperature 25 °C (77 °F)
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range
Error in measurement at limit setting incl. hysteresis and reproducibility	
• Linear characteristic	
- 250 mbar/25 kPa/3.6 psi	$r \leq 1.25$: ≤ 0.065 % $1.25 < r \leq 30$: ≤ (0.008 · r + 0.055) %
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi	$r \leq 5$: ≤ 0.065 % $5 < r \leq 100$: ≤ (0.004 · r + 0.045) %
- 400 bar/40 MPa/5802 psi 700 bar/70 MPa/10152 psi	$r \leq 3$: ≤ 0.075 % $3 < r \leq 10$: ≤ (0.0029 · r + 0.071) % $10 < r \leq 100$: ≤ (0.005 · r + 0.05) %
Influence of ambient temperature (in percent per 28 °C (50 °F))	
• 250 mbar/25 kPa/3.6 psi	≤ (0.16 · r + 0.1) %
• 1 bar/100 kPa/14.5 psi	≤ (0.05 · r + 0.1) %
• 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	≤ (0.025 · r + 0.125) %
• 700 bar/70 MPa/10152 psi	≤ (0.08 · r + 0.16) %
Long-term stability (temperature change ± 30 °C (± 54 °F))	
• 250 mbar/25 kPa/3.6 psi	≤ (0.25 · r) % per year
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi	≤ (0.25 · r) % in 5 years
• 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	≤ (0.125 · r) % in 5 years
• 700 bar/70 MPa/10152 psi	≤ (0.25 · r) % in 5 years
Effect of mounting position	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° inclination (zero point correction is possible with position error compensation)
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range

SITRANS P, DS III series for gauge pressure		
Operating conditions		
Degree of protection		
• according to EN 60529	IP66 (optional IP66/IP68)	
• according to NEMA 250	Type 4X	
Temperature of medium		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with inert filling liquid		
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	-40 ... +85 °C (-40 ... +185 °F)	
- 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi 700 bar/70 MPa/10152 psi	-20 ... +100 °C (-4 ... +212 °F)	
• Measuring cell with Neobee fill fluid (FDA-compliant)	-10 ... +100 °C (+14 ... +212 °F)	
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
• Ambient temperature (silicone oil and inert oil)		
- Transmitter	-40 ... +85 °C (-40 ... +185 °F)	
- Display readable	-30 ... +85 °C (-22 ... +185 °F)	
• Ambient temperature (Neobee fill fluid)		
- Transmitter	-10 ... +85 °C (+14 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Relative humidity 0 ... 100 %/Condensation permissible, suitable for use in the tropics	
• Electromagnetic Compatibility		
- Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21	
Design		
Weight (without options)	Die-cast aluminum: ≈ 2.0 kg (≈ 4.4 lb) Stainless steel precision casting: ≈ 4.6 kg (≈ 10.1 lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
• Connection shank	Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4602	
• Oval flange	Stainless steel, mat. no. 1.4404/316L	
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819	
Measuring cell filling	Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))	
Process connection	Connection shank G½B to DIN EN 837-1, female thread ½ -14 NPT or oval flange (PN 160 (MAWP 2320 psi)) to DIN 19213 with mounting thread M10 or $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518	
Material of mounting bracket		
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)	
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)	
Power supply U_H	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply	-	Supplied through bus
Separate supply voltage	-	Not necessary
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/ FOUNDATION Fieldbus
Certificates and approvals		
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 13 ATEX 2007 X	
- Marking	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 174 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC	To circuits with values: U_H = 9 ... 32 V DC
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Marking	Ex II 2 D Ex tb IIIC T120°C Db	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC; P_{max} = 1.2 W	To circuits with values: U_H = 9 ... 32 V DC; P_{max} = 1 W
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	U_m = 45 V	U_m = 32 V
- Connections (Ex ic)	To circuits with values: U_i = 45 V	FISCO supply unit ic: U_o = 17.5 V, I_o = 570 mA Linear barrier: U_o = 32 V, I_o = 132 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion protection acc. to FM	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	

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

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

1

for gauge pressure

Selection and Ordering data		Article No.
Pressure transmitter for gauge pressure, SITRANS P DS III with HART		↗ 7MF4033 - ■■■■■ - ■■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Inert liquid [1]	grease-free to cleanliness level 2	3
FDA compliant fill fluid[2]		
• Neobee oil	normal	4
Measuring span (min. ... max.)		
8.3 ... 250 mbar	(0.12 ... 3.6 psi)	A
0.01 ... 1 bar	(0.15 ... 14.5 psi)	B
0.04 ... 4 bar	(0.58 ... 58 psi)	C
0.16 ... 16 bar	(2.32 ... 232 psi)	D
0.63 ... 63 bar	(9.14 ... 914 psi)	E
1.6 ... 160 bar	(23.2 ... 2320 psi)	F
4.0 ... 400 bar	(58.0 ... 5802 psi)	G
7.0 ... 700 bar	(102.0 ...10153 psi)	J
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" **(recommended version)** [3] [4] [5] [6]		Y 1
Version for diaphragm seals in conjunction with process connector "G½B connection shank"" [3] [4] [5] [6]		Y 0
Process connection		
• Connection shank G½B to EN 837-1		0
• Female thread ½-14 NPT		1
• Stainless steel oval flange with process connection (Oval flange has no female thread)		
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518		2
- Mounting thread M10 to DIN 19213		3
- Mounting thread M12 to DIN 19213		4
• Male thread M20 x 1.5		5
• Male thread ½ -14 NPT		6
Non-wetted parts materials		
• Enclosure made of die-cast aluminium		0
• Enclosure stainless steel precision casting[7]		3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		

Selection and Ordering data	Article No.
Pressure transmitter for gauge pressure, SITRANS P DS III with HART	7MF4033 - ■■■■■ - ■■■■
Explosion protection	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)"[8]	D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[9]	P
- "Ex nA/ic (Zone 2)"[10]	E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[9][11]	R
• FM + CSA intrinsic safe (is)[12]	F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[9][11][12]	S
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)"[8][12]	N C
Electrical connection / cable entry	
• Screwed gland M20 x1 .5	B
• Screwed gland ½-14 NPT	C
• Device plug Han 7D (plastic enclosure) incl. mating connector[13]	D
• Device plugs M12 (stainless steel)[13][14]	F
Display	
• Without display	0
• Without visible display (display concealed, setting: mA)	1
• With visible display (setting: mA)	6
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)	7

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

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

1) For oxygen application, add Order code E10.
2) Available for measuring ranges 1 ... 63 bar.
3) When also ordering the quality test 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.
4) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
5) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403.-..Y..-.... and 7MF4900-1...-.B
6) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
7) Not in conjunction with Electrical connection "Device plug Han 7D".
8) Without cable gland, with blanking plug
9) With enclosed cable gland Ex ia and blanking plug
10) Configurations with device plugs Han and M12 are only available in Ex ic.
11) Only in connection with IP66.
12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
13) Only in connection with Ex approval A, B or E.
14) M12 delivered without cable socket

Selection and Ordering data		Article No.
Pressure transmitter for gauge pressure		
SITRANS P DS III with PROFIBUS PA (PA) ↗		7MF4034-
SITRANS P DS III with FOUNDATION Fieldbus (FF) ↗		7MF4035-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		■■■■■-■■■■
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Inert liquid[1]	grease-free to cleanliness level 2	3
FDA compliant fill fluid[2]		
• Neobee oil	normal	4
Nominal measuring range		
250 mbar	(3.6 psi)	A
1 bar	(14.5 psi)	B
4 bar	(58 psi)	C
16 bar	(232 psi)	D
63 bar	(914 psi)	E
160 bar	(2320 psi)	F
400 bar	(5802 psi)	G
700 bar	(10153 psi)	J
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" **(recommended version)** [3) 4) 5) 6)]		Y1
Version for diaphragm seals in conjunction with process connector "G½B connection shank"" [3) 4) 5) 6)]		Y0
Process connection		
• Connection shank G½B to EN 837-1		0
• Female thread ½-14 NPT		1
• Stainless steel oval flange with process connection (Oval flange has no female thread) [7)]		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		2
- Mounting thread M10 to DIN 19213		3
- Mounting thread M12 to DIN 19213		4
• Male thread M20 x 1.5		5
• Male thread ½ -14 NPT		6
Non-wetted parts materials		
• Enclosure made of die-cast aluminium		0
• Enclosure stainless steel precision casting		3
Version		
• Standard version, German label inscription, setting of pressure unit: bar		1
• International version, English label inscription, setting of pressure unit: psi		2
• Chinese version, English label inscription, setting of pressure unit: kPa		3
All versions include DVD with compact operating instructions in various EU languages.		

Selection and Ordering data	Article No.
Pressure transmitter for gauge pressure	
SITRANS P DS III with PROFIBUS PA (PA)	7MF4034-
SITRANS P DS III with FOUNDATION Fieldbus (FF)	7MF4035-
	■■■■■-■■■■
Explosion protection	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)"[8)]	D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[9)]	P
- "Ex nA/ic (Zone 2)"[10)]	E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[9) 11)]	R
• FM + CSA intrinsic safe (is)[12)]	F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[9)11)12)]	S
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)"[8)12)]	NC
Electrical connection/cable entry	
• Screwed gland M20 x 1.5	B
• Screwed gland ½-14 NPT	C
• Device plugs M12 (stainless steel)[13)14)]	F
Display	
• Without display	0
• Without visible display (display concealed, setting: bar)	1
• With visible display (setting: bar)	6
• with customer-specific display (setting as specified, Order code "Y21" required)	7

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

1) For oxygen application, add Order code E10.
2) Available for measuring ranges 1 ... 63 bar.
3) When also ordering the quality test 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.
4) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
5) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403.-..Y..-.... and 7MF4900-1...-.B
6) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
7) M10 fastening thread: Max. measuring span 160 bar (2320 psi) 7/16-20 UNF and M12 fastening thread: Max. measuring span 400 bar (5802 psi)
8) Without cable gland, with blanking plug.
9) With enclosed cable gland Ex ia and blanking plug.
10) Configurations with device plugs Han and M12 are only available in Ex ic.
11) Only in connection with IP66.
12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
13) M12 delivered without cable socket.
14) Only in connection with Ex approval A, B, E or F.

1

for gauge pressure

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:				
• Steel	**A01**	✓	✓	✓
• Stainless steel 304	**A02**	✓	✓	✓
• Stainless steel 316L	**A03**	✓	✓	✓
Device plugs[1]				
• Han 7D (metal)	**A30**	✓		
• Han 8D (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
• Han 8D (metal)	**A33**	✓		
Cable sockets for device plugs M12 (metal (CuZn))	**A50**	✓	✓	✓
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
• Cyrillic (russian)	**B16**	✓	✓	✓
English rating plate Pressure units in inH_20 and/or psi	**B21**	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)[2]	**C11**	✓	✓	✓
Inspection certificate[3] Acc. to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	**C14**	✓	✓	✓
Inspection certificate (EN 10204-3.1) PMI test of parts in contact with medium	**C15**	✓	✓	✓
Functional safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C20**	✓		
Functional safety (PROFIsafe) Certificate and PROFIsafe protocol	**C21**[4]		✓	
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C23**	✓		
PED for Russia with initial calibration mark	**C99**	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	✓		
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)	**D07**	✓	✓	✓
Degree of protection IP66/IP68 (only for M20x1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Supplied with oval flange (1 item), PTFE packing and screws in thread of oval flange	**D37**	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	**D59**	✓	✓	✓
Use in or on zone 1D/2D[5] (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-.B.. Ex ia)" and IP66)	**E01**	✓	✓	✓
Oxygen application (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))	**E10**	✓	✓	✓
Export approval Korea	**E11**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
CRN approval Canada (Canadian Registration Number)	**E22**[6]	✓	✓	✓
Dual seal	**E24**	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.B..)	**E25**[7]	✓	✓	✓
"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.D..)	**E26**[7]	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.P..)	**E28**[7]	✓	✓	
Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-.B..)	**E45**[7]	✓	✓	✓
Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-.D..)	**E46**[7]	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-.B..)	**E5**[7]	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-.D..)	**E56**[7]	✓	✓	✓
Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.E..)	**E57**[7]	✓	✓	✓
Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.R..)	**E58**[7]	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-.[B, D]..-Z + E11)	**E70**[7]	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia) (only for transmitter 7MF4...-.....-.B..)	**E80**	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia) (only for transmitter 7MF4...-.....-.D..)	**E81**	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia) (only for transmitter 7MF4...-.....-.E..)	**E82**	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia) (only for transmitter 7MF4...-.....-.R..)	**E83**	✓	✓	✓
Two coats of lacquer on enclosure and cover (PU on epoxy)	**G10**	✓	✓	✓
Transient protector 6 kV (lightning protection)	**J01**	✓	✓	✓
Process connection Astava	**J06**	✓	✓	✓

Selection and Ordering data	Order code			
Further designs Add "**-Z**" to Article No. and specify Order code.		**HART**	**PA**	**FF**
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	**S10**	✓	✓	✓
• Lloyds Register (LR)	**S11**	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	**S12**	✓	✓	✓
• American Bureau of Shipping (ABS)	**S14**	✓	✓	✓
• Russian Maritime Register (RMR)	**S16**	✓	✓	✓
• Korean Register of Shipping (KR)	**S17**	✓	✓	✓

1) Device plug Han IP65

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

4) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

6) Cannot be ordered with remote seal.

7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

Selection and Ordering data	Order code			
Additional data Please add "**-Z**" to Article No. and specify Order code(s) and plain text.		**HART**	**PA**	**FF**
Measuring range to be set Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	**Y01**	✓	✓[1]	
Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15:	**Y15**[2]	✓	✓	✓
Measuring point text (entry in device variable) Max. 27 characters, specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART address (TAG) Max. 8 characters, specify in plain text: Y17:	**Y17**	✓		
Setting of pressure indication in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H_2O*), inH_2O*), ftH_2O*), mmHG, inHG, psi, Pa, kPa, MPa, g/cm², kg/cm², Torr, ATM or % *) ref. temperature 20 °C	**Y21**	✓	✓	✓
Setting of pressure indication in non-pressure units[3] Specify in plain text: Y22: ..... up to ..... l/min, m³/h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	**Y22 + Y01**	✓		
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	**Y25**		✓	✓
Damping adjustment in seconds (0 ... 100 s)	**Y30**	✓	✓	✓

Factory mounting of valve manifolds, see accessories.

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

✓ = available

Ordering example

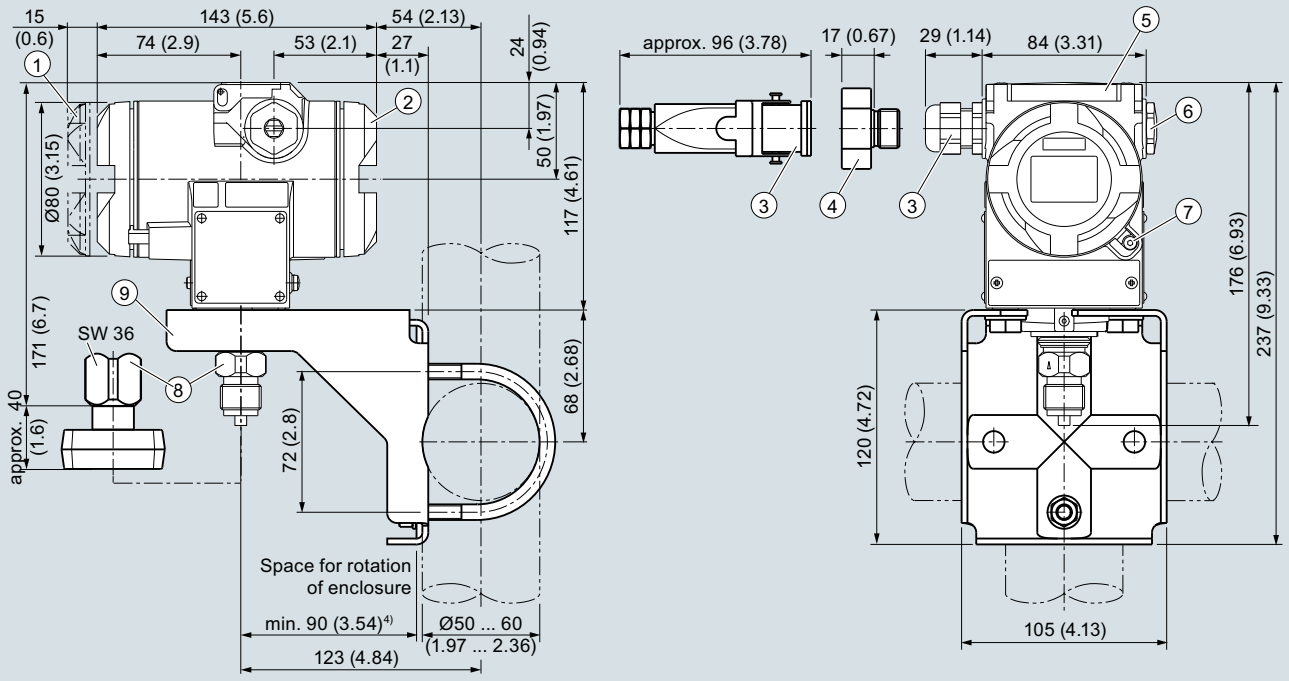
Item line:	7MF4033-1EA00-1AA7-Z
B line:	A01 + Y01 + Y21
C line:	Y01: 10 ... 20 bar (145 ... 290 psi)
C line:	Y21: bar (psi)

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

2) If you do not wish to have any text engraved for Y15, then do not make any further text entries as "Y15:".

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 M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/8D device plug[2] [3]
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 G½B 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) Minimum distance for rotating

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

Technical specifications

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

Input of gauge pressure, with front-flush diaphragm

Measured variable	Gauge pressure, front-flush

Measuring span (continuously adjustable) or nominal measuring range, max. operating pressure and max. test pressure

HART	PROFIBUS PA/ FOUNDATION Fieldbus		
Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi)
0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 psi	10 bar 1 MPa 145 psi
0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
0.63 ... 63 bar 63 ... 6300 kPa 9.1 ... 914 psi	63 bar 6300 kPa 914 psi	67 bar 6.7MPa 972 psi	100 bar 10 MPa 1450 psi

Lower measuring limit	
• Measuring cell with silicone oil filling	100 mbar a/10 kPa a/1.45 psi a
• Measuring cell with inert filling liquid	100 mbar a/10 kPa a/1.45 psi a
• Measuring cell with Neobee	100 mbar a/10 kPa a/1.45 psi a
Upper measuring limit	100 % of max. measuring span

Input of absolute pressure, with front-flush diaphragm

Measured variable	Absolute pressure, front-flush

Measuring span (continuously adjustable) or nominal measuring range, max. operating pressure and max. test pressure

HART	PROFIBUS PA/ FOUNDATION Fieldbus		
Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
43.34 ... 1300 mbar a 4.33 ... 130 kPa a 17 ... 525 inH_2O a	1300 mbar a 130 kPa a 525 inH_2O a	2.6 bar a 260 kPa a 37.7 psi a	10 bar a 1 MPa a 145 psi a
160 ... 5000 mbar a 16 ... 500 kPa a 2.32 ... 72.5 psi a	5000 mbar a 500 kPa a 72.5 psi a	10 bar a 1 MPa a 145 psi a	30 bar a 3 MPa a 435 psi a
1 ... 30 bar a 0.1 ... 3 MPa a 14.6 ... 435 psi a	30 bar a 3 MPa a 435 psi a	45 bar a 4.5 MPa a 653 psi a	100 bar a 10 MPa a 1450 psi a

Depending on the process connection, the measuring span may differ from these values

Lower measuring limit	0 mbar a/0 kPa a/0 psi a
Upper measuring limit	100 % of max. measuring span

Output	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-
Load		
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V	-
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)	-
Physical bus	-	IEC 61158-2
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.	
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)	

SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm		
Measuring accuracy	Acc. to IEC 60770-1	
Reference conditions (All error data refer always refer to the set span)	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Silicone oil filling • Room temperature 25 °C (77 °F)	
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range	
Error in measurement at limit setting incl. hysteresis and reproducibility		
• Linear characteristic	**Gauge pressure, front-flush**	**Absolute pressure, front-flush**
- r ≤ 5	≤ 0.075 %	-
- 5 < r ≤ 100	≤ (0.005 · r + 0.05) %	-
- r ≤ 10	-	≤ 0.2 %
- 10 < r ≤ 30	-	≤ 0.4 %
Influence of ambient temperature (in percent per 28 °C (50 °F))	≤ (0.08 · r + 0.16) %	≤ (0.16 · r + 0.24) %
Effect of ambient temperature (in pressure per temperature change)		
• Temperature difference between medium temperature and ambient temperature	3 mbar/0.3 kPa/0.04 psi per 10 K	
Long-term stability (temperature change ± 30 °C (± 54 °F))	≤ (0.25 · r) % in 5 years	
Effect of mounting position (in pressure per change in angle)	0.4 mbar/0.04 kPa/0.006 per 10° inclination (zero point correction is possible with position error compensation)	
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V	
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range	
Operating 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	-40 ... +85 °C (-40 ... +185 °F)	
• Transmitter	-40 ... +85 °C (-40 ... +185 °F)	
• Display readable	-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)) (for high temperature oil: -10 ... + 85 °C (14 ... 185 °F))	
Climatic class		
• Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
Degree of protection		
• according to EN 60529	IP66 (optional IP66/IP68)	
• according to NEMA 250	Type 4X	
Electromagnetic Compatibility		
• Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21	
Medium conditions	The max. medium temperature of the front-flush process connections is to be taken into account in accordance with the relevant connection standards (e. g. DIN 32676, DIN 11851 etc.).	
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 for gauge pressure version with front-flush diaphragm)	-40 ... +200 °C (-40 ... +392 °F)	
• Measuring cell with Neobee oil, with temp. decoupler (only for gauge pressure version with flush-mounted diaphragm)	-10 ... +200 °C (14 ... 392 °F)	
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)	
• Measuring cell with high-temperature oil (only for gauge pressure version with front-flush diaphragm)	-10 ... +250 °C (14 ... 482 °F)	

SITRANS P DS III series for gauge and absolute pressure, with front-flush diaphragm		
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 or Hastelloy C276, mat. no. 2.4819	
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 acc. to 3A; R_a-values ≤ 0.8 µm (32 µ-inch)/welds R_a) ≤ 0.8 µm (32 µ-inch)	
Power supply U_H	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply	-	Supplied through bus
Separate supply voltage	-	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 and absolute pressure, with front-flush diaphragm		
Certificates and approvals		
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 13 ATEX 2007 X	
- Marking	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC	To circuits with values: U_H = 9 ... 32 V DC
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Dust explosion protection for zone 21/22	Ex II 2 D Ex tb IIIC T120°C Db	
- 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 W
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	U_m = 45 V	U_m = 32 V
- Connections (Ex ic)	To circuits with values: U_i = 45 V	FISCO supply unit ic: U_o = 17.5 V, I_o = 570 mA Linear barrier: U_o = 32 V, I_o = 132 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion protection acc. to FM	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

Hygiene version

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

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

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

1

for gauge/absolute pressure, with front-flush diaphragm

Selection and Ordering data		Article No.
Pressure transmitter for gauge and absolute pressure, front-flush diaphragm, SITRANS P DS III HART ↗		7MF4133-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Inert liquid		3
FDA compliant fill fluid		
• Neobee oil	normal	4
Measuring span (min. ... max.)		
0.01 ... 1 bar	(0.15 ... 14.5 psi)	B
0.04 ... 4 bar	(0.58 ... 58 psi)	C
0.16 ... 16 bar	(2.32 ... 232 psi)	D
0.63 ... 63 bar	(9.14 ... 914 psi)	E
43.34 ... 1300 mbar a[1]	(0.63 ... 18.86 psi a)[1]	S
0.17 ... 5 bar a[1]	(2.43 ... 72.5 psi a)[1]	T
1 ... 30 bar a[1]	(4.35 ... 435 psi 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		
• Enclosure made of die-cast aluminium		0
• Enclosure stainless steel precision casting		3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
- "Explosion-proof (Ex d)" [3]		D
- „Ex nA/ic (Zone 2)"[4]		E
• FM + CSA intrinsic safe (is)[5]		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[5][6][7]		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)"[3][5]		N C
Electrical connection/cable entry		
• Inner thread M20 x 1.5		B
• Female thread ½-14 NPT		C
• Device plug Han 7D (plastic enclosure) incl. mating connector[8]		D
• Device plugs M12 (stainless steel)[9] [10]		F

Selection and Ordering data	Article No.
Pressure transmitter for gauge and absolute pressure, front-flush diaphragm, SITRANS P DS III HART	7MF4133-
Display	
• Without display	0
• Without visible display (display concealed, setting: mA)	1
• With visible display (setting: mA)	6
• With customer-specific display (setting as specified, Order code "Y21" or "Y22" required)	7

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

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

1) Not with temperature decoupler P00, not for process connections R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.
2) Only available for flanges with options M.., N.. and Q..
3) Without cable gland, with blanking plug
4) Configurations with device plugs Han and M12 are only available in Ex ic.
5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
6) Only in connection with IP66.
7) With enclosed cable gland Ex ia and blanking plug.
8) Only in connection with Ex approval A, B or E.
9) Only in connection with Ex approval A, B, E or F.
10) M12 delivered without cable socket

Selection and Ordering data		Article No.
Pressure transmitter P for gauge and absolute pressure, front-flush diaphragm:		
SITRANS P DS III with PROFIBUS PA (PA) ↗		**7MF4134-**
SITRANS P DS III with FOUNDATION Fieldbus (FF) ↗		**7MF4135-**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		■■■■■-■■■■
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	**1**
Inert liquid		**3**
FDA compliant fill fluid		
• Neobee oil	normal	**4**
Nominal measuring range		
1 bar	(14.5 psi)	**B**
4 bar	(58 psi)	**C**
16 bar	(232 psi)	**D**
63 bar	(914 psi)	**E**
1300 mbar a[1]	(18.86 psi a)[1]	**S**
5 bar a[1]	(72.5 psi a)[1]	**T**
30 bar a[1]	(435 psi 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		
• Enclosure made of die-cast aluminium		**0**
• Enclosure stainless steel precision casting		**3**
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		**1**
• International version, English plate inscription, setting for pressure unit: bar		**2**
• Chinese version, English plate inscription, setting for pressure unit: Pascal		**3**
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None		**A**
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		**B**
- "Explosion-proof (Ex d)"[3]		**D**
- „Ex nA/ic (Zone 2)"[4]		**E**
• FM + CSA intrinsic safe (is)[5]		**F**
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[5][6][7]		**S**
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)"[3][5] (available soon)		**NC**
Electrical connection/cable entry		
• Screwed gland M20 x 1.5		**B**
• Screwed gland ½-14 NPT		**C**
• Device plugs M12 (stainless steel)[8] [9]		**F**

Selection and Ordering data	Article No.
Pressure transmitter P for gauge and absolute pressure, front-flush diaphragm:	
SITRANS P DS III with PROFIBUS PA (PA)	**7MF4134-**
SITRANS P DS III with FOUNDATION Fieldbus (FF)	**7MF4135-**
	■■■■■-■■■■
Display	
• Without display	**0**
• Without visible display (display concealed, setting: bar)	**1**
• With visible display (setting: bar)	**6**
• With customer-specific display (setting as specified, Order code "Y21" required)	**7**

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

1) Not with temperature decoupler P00, not for process connections R01, R02, R04, R10 and R11, and can only be ordered in conjunction with silicone oil.
2) Only available for flanges with options M.., N.. and Q.
3) Without cable gland, with blanking plug
4) Configurations with device plugs Han and M12 are only available in Ex ic.
5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
6) Only in connection with IP66.
7) With enclosed cable gland Ex ia and blanking plug.
8) Only in connection with Ex approval A, B, E or F.
9) M12 delivered without cable socket

1

for gauge/absolute pressure, with front-flush diaphragm

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Device plugs[1]				
• Han 7D (metal)	**A30**	✓		
• Han 8D (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
• Han 8D (metal)	**A33**	✓		
Cable sockets for device plugs M12 (metal (CuZn))	**A50**	✓	✓	✓
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
• Cyrillic (russian)	**B16**	✓	✓	✓
English rating plate Pressure units in inH_20 and/or psi	**B21**	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	**C14**	✓	✓	✓
Functional safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C20**	✓		
Functional safety (PROFIsafe) Certificate and PROFIsafe protocol	**C21**[2]		✓	
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C23**	✓		
PED for Russia with initial calibration mark	**C99**	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	✓		
Degree of protection IP66/IP68 (only for M20x1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	**D59**	✓	✓	✓
Oxygen application (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))	**E10**	✓	✓	✓
Export approval Korea	**E11**	✓	✓	✓
CRN approval Canada (Canadian Registration Number)	**E22**[3]	✓	✓	✓
Dual seal	**E24**	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.B..)	**E25**[4]	✓	✓	✓
"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.D..)	**E26**[4]	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.P..)	**E28**[4]	✓	✓	
Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-.B..)	**E45**[4]	✓	✓	✓
Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-.D..)	**E46**[4]	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-.B..)	**E55**[4]	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-.D..)	**E56**[4]	✓	✓	✓
Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.E..)	**E57**[4]	✓	✓	✓
Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.R..)	**E58**[4]	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-.[B, D]..-Z + E11)	**E70**[4]	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)	**E80**	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)	**E81**	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	**E82**	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	**E83**	✓	✓	✓
Two coats of lacquer on enclosure and cover (PU on epoxy)	**G10**	✓	✓	✓
Transient protector 6 kV (lightning protection)	**J01**	✓	✓	✓
Flanges to EN 1092-1, Form B1				
• DN 25, PN 40[5]	**M11**	✓	✓	✓
• 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[5]	**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 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[6]	**R01**	✓	✓	✓
• G 1"-A, front-flush[6]	**R02**	✓	✓	✓
• G 2"-A, front-flush	**R04**	✓	✓	✓
Tank connection[7]				
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 Article No. and specify Order code.				
Sanitary process connection according DIN 11851 (Dairy connection with slotted union nut)				
• 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 65/2.5", PN 10	**N15**	✓	✓	✓
• Clamp 2" ISO 2852 PN 16	**N22**	✓	✓	✓
• Clamp 3" ISO 2852 PN 16	**N23**	✓	✓	✓
Varivent connection EHEDG compliant				
• Type N = 68 for Varivent enclosure DN 40 ... 125 and 1½" ... 6", PN 40	**N28**	✓	✓	✓
Temperature decoupler up to 200 °C[8] for version with front-flush diaphragm	**P00**	✓	✓	✓
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 EHEDG compliant				
• 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 EHEDG compliant				
• 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 Article No. and specify Order code.				
Sanitary process connection to NEUMO Bio-Connect clamp connection EHEDG compliant				
• 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**	✓	✓	✓
Bio-Control sanitary process connection				
• DN 50, PN 16	**Q53**	✓	✓	✓
• DN 65, PN 16	**Q54**	✓	✓	✓
Sanitary process connection to NEUMO Bio-Connect S flange connection				
• DN 2", PN 16	**Q72**	✓	✓	✓
Aseptic threaded socket to DIN 11864-1 Form A				
• DN 50, PN 25	**N33**	✓	✓	✓
• DN 65, PN 25	**N34**	✓	✓	✓
• DN 80, PN 25	**N35**	✓	✓	✓
• DN 100, PN 25	**N36**	✓	✓	✓
Aseptic flange with notch to DIN 11864-2 Form A				
• DN 50, PN 16	**N43**	✓	✓	✓
• DN 65, PN 16	**N44**	✓	✓	✓
• DN 80, PN 16	**N45**	✓	✓	✓
• DN 100, PN 16	**N46**	✓	✓	✓
Aseptic flange with groove to DIN 11864-2 Form A				
• DN 50, PN 16	**N43 + P11**	✓	✓	✓
• DN 65, PN 16	**N44 + P11**	✓	✓	✓
• DN 80, PN 16	**N45 + P11**	✓	✓	✓
• DN 100, PN 16	**N46 + P11**	✓	✓	✓
Aseptic clamp with groove to DIN 11864-3 Form A				
• DN 50, PN 25	**N53**	✓	✓	✓
• DN 65, PN 25	**N54**	✓	✓	✓
• DN 80, PN 16	**N55**	✓	✓	✓
• DN 100, PN 16	**N56**	✓	✓	✓

1) Device plug Han IP65
2) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H.
3) Cannot be ordered with remote seal.
4) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.
5) Special seal in Viton included in the scope of delivery. FKM; temperature range -20 ... +200 °C (-4 ... +392 °C)
6) Cannot be combined with Order code P00. Can only be ordered with silicone oil measuring cell filling.
7) The weldable socket can be ordered under accessories.
8) 3A and EHEDG compliant. The maximum permissible temperatures of the medium depend on the respective cell fillings (see medium conditions).

for gauge/absolute pressure, with front-flush diaphragm

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

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

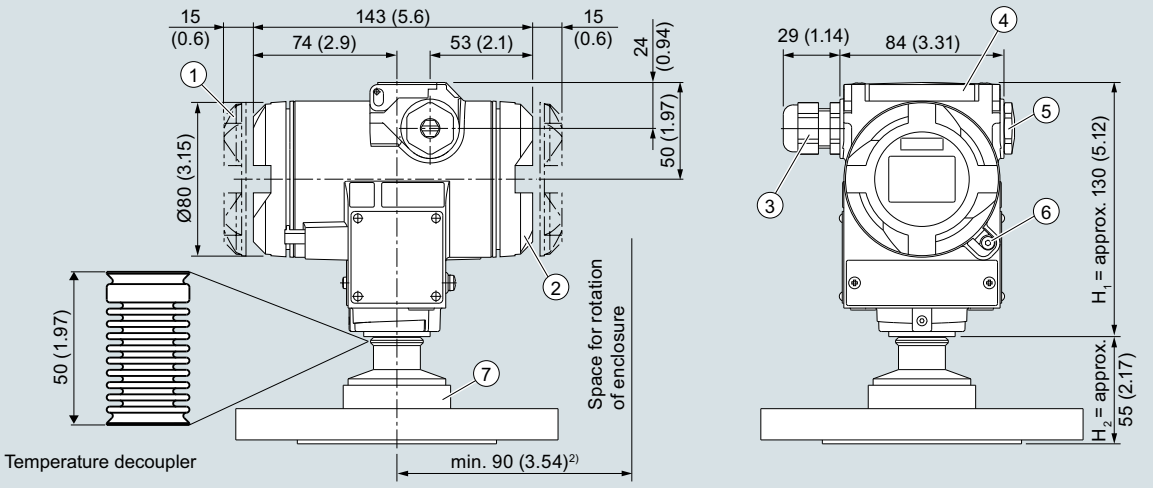
✓ = available

ordering example

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

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

Dimensional drawings



1. 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 device plug
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)
2) Allow approx. 20 mm (0.79 inch) thread length to permit unscrewing
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

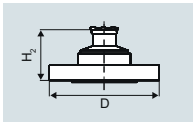
Only the height H_2 is indicated in the dimensions of the flanges.

for gauge/absolute pressure, with front-flush diaphragm

Flanges according to EN and ASME

Flange according to EN

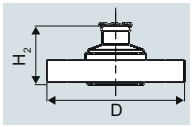
EN 1092-1



Order code	DN	PN	∅D	H_2
M11	25	40	115 mm (4.5")	Approx. 52 mm (2")
M13	40	40	150 mm (5.9")	
M23	40	100	170 mm (6.7")	
M04	50	16	165 mm (6.5")	
M14	50	40	165 mm (6.5")	
M06	80	16	200 mm (7.9")	
M16	80	40	200 mm (7.9")	

Flanges according to ASME

ASME B16.5

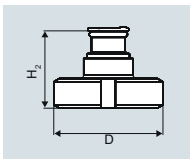


Order code	DN	PN	∅D	H_2
M40	1"	150	110 mm (4.3")	Approx. 52 mm (2")
M41	1½"	150	130 mm (5.1")	
M42	2"	150	150 mm (5.9")	
M43	3"	150	190 mm (7.5")	
M44	4"	150	230 mm (9.1")	
M46	1½"	300	155 mm (6.1")	
M47	2"	300	165 mm (6.5")	
M48	3"	300	210 mm (8.1")	
M49	4"	300	255 mm (10.0")	

NuG and pharmaceutical connections

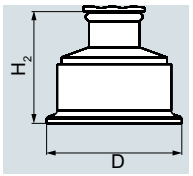
Connections to DIN

DIN 11851 (milk pipe union with slotted union nut)



Order code	DN	PN	∅D	H_2
N04	50	25	92 mm (3.6")	Approx. 52 mm (2")
N06	80	25	127 mm (5.0")	

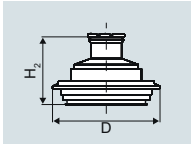
Tri-Clamp nach DIN 32676



Order code	DN	PN	∅D	H_2
N14	50	16	64 mm (2.5")	Approx. 52 mm (2")
N15	65	10	91 mm (3.6")	

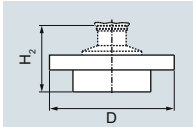
Other connections

Varivent connection



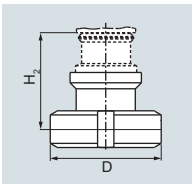
Order code	DN	PN	∅D	H_2
N28	40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

Sanitary process connection to DRD



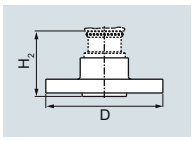
Order code	DN	PN	∅D	H_2
M32	50	40	105 mm (4.1")	Approx. 52 mm (2")

Sanitary process screw connection to NEUMO Bio-Connect



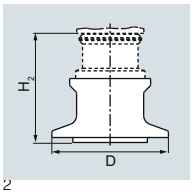
Order code	DN	PN	∅D	H_2
Q05	50	16	82 mm (3.2")	Approx. 52 mm (2")
Q06	65	16	105 mm (4.1")	
Q07	80	16	115 mm (4.5")	
Q08	100	16	145 mm (5.7")	
Q13	2"	16	82 mm (3.2")	
Q14	2½"	16	105 mm (4.1")	
Q15	3"	16	105 mm (4.1")	
Q16	4"	16	145 mm (5.7")	

Sanitary process connection to NEUMO Bio-Connect flange connection



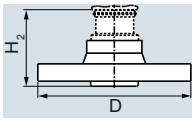
Order code	DN	PN	∅D	H_2
Q23	50	16	110 mm (4.3")	Approx. 52 mm (2")
Q24	65	16	140 mm (5.5")	
Q25	80	16	150 mm (5.9")	
Q26	100	16	175 mm (6.9")	
Q31	2"	16	100 mm (3.9")	
Q32	2½"	16	110 mm (4.3")	
Q33	3"	16	140 mm (5.5")	
Q34	4"	16	175 mm (6.9")	

Sanitary process connection to NEUMO Bio-Connect clamp connection



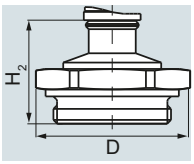
Order code	DN	PN	∅D	H_2
Q39	50	16	77.4 mm (3.0")	Approx. 52 mm (2")
Q40	65	10	90.9 mm (3.6")	
Q41	80	10	106 mm (4.2")	
Q42	100	10	119 mm (4.7")	
Q48	2½"	16	90.9 mm (3.6")	
Q49	3"	10	106 mm (4.2")	
Q50	4"	10	119 mm (4.7")	

Sanitary process connection to NEUMO Bio-Connect S flange connection



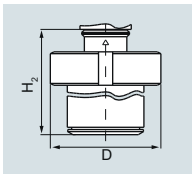
Order code	DN	PN	∅D	H_2
Q72	2"	16	125 mm (4.9")	Approx. 52 mm (2")

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



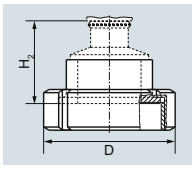
Order code	DN	PN	∅D	H_2
R01	¾"	60	37 mm (1.5")	Approx. 45 mm (1.8")
R02	1"	60	48 mm (1.9")	Approx. 47 mm (1.9")
R04	2"	60	78 mm (3.1")	Approx. 52 mm (2")

Tank connection TG 52/50 and TG52/150



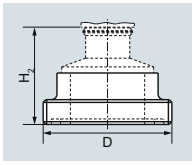
Order code	DN	PN	∅D	H_2
R10	25	40	63 mm (2.5")	Approx. 63 mm (2.5")
R11	25	40	63 mm (2.5")	Approx. 170 mm (6.7")

SMS socket with union nut



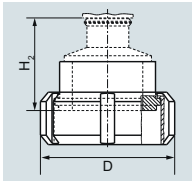
Order code	DN	PN	∅D	H_2
M67	2"	25	84 mm (3.3")	Approx. 52 mm (2")
M68	2½"	25	100 mm (3.9")	
M69	3"	25	114 mm (4.5")	

SMS threaded socket



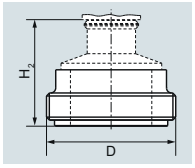
Order code	DN	PN	∅D	H_2
M73	2"	25	70 x 1/6 mm	Approx. 52 mm (2")
M74	2½"	25	85 x 1/6 mm	
M75	3"	25	98 x 1/6 mm	

IDF socket with union nut



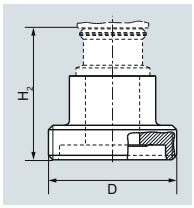
Order code	DN	PN	∅D	H_2
M82	2"	25	77 mm (3")	Approx. 52 mm (2")
M83	2½"	25	91 mm (3.6")	
M84	3"	25	106 mm (4.2")	

IDF threaded socket



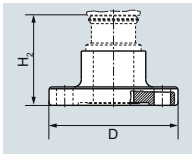
Order code	DN	PN	∅D	H_2
M92	2"	25	64 mm (2.5")	Approx. 52 mm (2")
M93	2½"	25	77.5 mm (3.1")	
M94	3"	25	91 mm (3.6")	

Aseptic threaded socket to DIN 11864-1 Form A



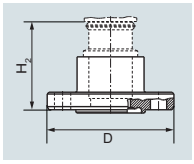
Order code	DN	PN	∅D	H_2
N33	50	25	78 x 1/6"	Approx. 52 mm (2")
N34	65	25	95 x 1/6"	
N35	80	25	110 x ¼"	
N36	100	25	130 x ¼"	

Aseptic flange with notch to DIN 11864-2 Form A



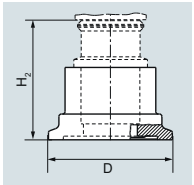
Order code	DN	PN	∅D	H_2
N43	50	16	94	Approx. 52 mm (2")
N44	65	16	113	
N45	80	16	133	
N46	100	16	159	

Aseptic flange with groove to DIN 11864-2 Form A



Order code	DN	PN	∅D	H_2
N43 + P11	50	16	94	Approx. 52 mm (2")
N44 + P11	65	16	113	
N45 + P11	80	16	133	
N46 + P11	100	16	159	

Aseptic clamp with groove to DIN 11864-3 Form A



Order code	DN	PN	∅D	H_2
N53	50	25	77.5	Approx. 52 mm (2")
N54	65	25	91	
N55	80	16	106	
N56	100	16	130	

Technical specifications

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

Input				
Measured variable	Absolute pressure			
Measuring span (fully adjustable) or nominal measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**		
	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	8.34 ... 250 mbar a 0.83 ... 25 kPa a 3.35 ... 100 inH_2O a	250 mbar a 25 kPa a 100 inH_2O a	1.5 bar a 150 kPa a 21.8 psi a	6 bar a 600 kPa a 87 psi a
	43.34 ... 1300 mbar a 4.33 ... 130 kPa a 17.42 ... 522.4 inH_2O a	1300 mbar a 130 kPa a 525 inH_2O a	2.6 bar a 260 kPa a 37.7 psi a	10 bar a 1 MPa a 145 psi a
	170 ... 5000 mbar a 17 ... 500 kPa a 2.43 ... 72.5 psi a	5000 mbar a 500 kPa a 72.5 psi a	10 bar a 1 MPa a 145 psi a	30 bar a 3 MPa a 435 psi a
	1 ... 30 bar a 0.1 ... 3 MPa a 14.6 ... 435 psi a	30 bar a 3 MPa a 435 psi a	45 bar a 4.5 MPa a 653 psi a	100 bar a 10 MPa a 1450 psi a
	5,34 ... 160 bar a 0.53 ... 16 MPa a 77.4 ... 2321 psi a	160 bar a 16 MPa a 2321 psi	167 bar a 16,7 MPa a 2422 psi	250 bar a 25 MPa a 3626 psi
	13.34 ... 400 bar a 1.3 ... 40 MPa a 193.4 ... 5802 psi a	400 bar a 40 MPa a 5802 psi a	400 bar a 40 MPa a 5802 psi a	600 bar a 60 MPa a 8702 psi a
	23.34 ... 700 bar a 2.33 ... 70 MPa a 338.43 ... 10153 psi a	700 bar a 70 MPa a 10153 psi a	800 bar a 80 MPa a 11603 psi a	800 bar a 80 MPa a 11603 psi a
Lower measuring limit				
• Measuring cell with silicone oil filling	0 mbar a/0 kPa a/0 psi a			
• Measuring cell with inert filling liquid				
- for temperature of medium -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)	30 mbar a/3 kPa a/0.44 psi a			
- for temperature of medium 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))	30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C 3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C 0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F			
Upper measuring limit	100 % of max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)			
Lower range value	Between the measuring limits (fully adjustable)			
Output	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**		
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal		
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-		
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-		
Load				
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V	-		
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)	-		
Physical bus	-	IEC 61158-2		
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.			
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)			

SITRANS P DS III series for absolute pressure (from the gauge pressure series)	
Measuring accuracy	Acc. to IEC 60770-1
Reference conditions (All error data refer always refer to the set span)	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Silicone oil filling • Room temperature 25 °C (77 °F)
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range
Error in measurement at limit setting incl. hysteresis and reproducibility	
• Linear characteristic	
- r ≤ 10	≤ 0.1 %
- 10 < r ≤ 30	≤ 0.2 %
Influence of ambient temperature (in percent per 28 °C (50 °F))	
• 250 mbar a/25 kPa a/3.6 psi a	≤ (0.15 · r + 0.1) %
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 100 bar a/10 MPa a/1450 psi a 160 bar a/16 MPa a/2321 psi a 400 bar a/40 MPa a/5802 psi a 700 bar a/50 MPa a/10152 psi a	≤ (0.08 · r + 0.16) %
Long-term stability (temperature change ± 30 °C (± 54 °F))	≤ (0.25 · r) % in 5 years
Effect of mounting position (in pressure per change in angle)	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° inclination (zero point correction is possible with position error compensation)
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range
Operating conditions	
Degree of protection	
• according to EN 60529	IP66 (optional IP66/IP68)
• according to NEMA 250	Type 4X
Temperature of medium	
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) with 30 bar a measuring cell
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)
Ambient conditions	
• Ambient temperature	
- Transmitter	-40 ... +85 °C (-40 ... +185 °F)
- Display readable	-30 ... +85 °C (-22 ... +185 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
• Climatic class	
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics
• Electromagnetic Compatibility	
- Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21

SITRANS P DS III series for absolute pressure (from the gauge pressure series)		
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. 2.4602	
• Oval flange	Stainless steel, mat. no. 1.4404/316L	
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819	
Measuring cell filling	Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))	
Process connection	Connection shank G½B to 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 IEC 61518/DIN EN 61518	
Material of mounting bracket		
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)	
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)	
Power supply U_H	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate supply voltage	-	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 absolute pressure (from the gauge pressure series)		
Certificates and approvals	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 13 ATEX 2007 X	
- Marking	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC	To circuits with values: U_H = 9 ... 32 V DC
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 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 Ex tb IIIC T120°C Db	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC; P_{max} = 1.2 W	To circuits with values: U_H = 9 ... 32 V DC; P_{max} = 1 W
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	U_m = 45 V	U_m = 32 V
- Connection (Ex ic)	To circuits with values: U_i = 45 V	FISCO supply unit ic: U_o = 17.5 V, I_o = 570 mA Linear barrier: U_o = 32 V, I_o = 132 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion protection acc. to FM	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	

for absolute pressure (from gauge pressure series)

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
- Specification of a container characteristic with	Max. 30 nodes
- Square-rooted characteristic for flow measurement	Yes
- Gradual volume suppression and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or over parameterizable ramp function

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

Selection and Ordering data		Article No.
Pressure transmitters for absolute pressure from gauge pressure series SITRANS P DS III with HART		↗ 7MF4233 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Inert liquid[1]	grease-free to cleanliness level 2	3
Measuring span (min. ... max.)		
8.34 ... 250 mbar a	(0.13 ... 3.63 psi a)	D
43.34 ... 1300 mbar a	(0.63 ... 18.86 psi a)	F
0.17 ... 5 bar a	(2.43 ... 72.5 psi a)	G
1 ... 30 bar a	(14.6 ... 435 psi a)	H
5.34 ... 160 bar a [2]	(77.4 ... 2 321 psi a)	L
13.34 ... 400 bar a [2]	(193.4 ... 5 802 psi a)	M
23.34 ... 700 bar a [2]	(338.43 ... 10 153 psi a)	N
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" **(recommended version)** [3) 4) 5) 6) 7)]		Y 1
Version for diaphragm seals in conjunction with process connector "G½B connection shank" [3) 4) 5) 6) 7)]		Y 0
Process connection		
• Connection shank G½B to EN 837-1		0
• Female thread ½-14 NPT		1
• Stainless steel oval flange with process connection (Oval flange has no female thread)		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		2
- Mounting thread M10 to DIN 19213		3
- Mounting thread M12 to DIN 19213		4
• Male thread M20 x 1.5		5
• Male thread ½ -14 NPT		6
Non-wetted parts materials		
• Enclosure made of die-cast aluminium		0
• Enclosure stainless steel precision casting[8)]		3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
- "Explosion-proof (Ex d)"[9)]		D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[10)]		P
- "Ex nA/ic (Zone 2)"[11)]		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"[10)12)]		R
• FM + CSA intrinsic safe (is)[13)]		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[10)12)13)]		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)"[9)13)]		N C

Selection and Ordering data	Article No.
Pressure transmitters for absolute pressure from gauge pressure series SITRANS P DS III with HART	7MF4233 -
Electrical connection/cable entry	
• Screwed gland M20x1.5	B
• Screwed gland ½-14 NPT	C
• Device plug Han 7D (plastic enclosure) incl. mating connector[14)]	D
• Device plugs M12 (stainless steel) [15) 16)]	F
Display	
• Without display	0
• Without visible display (display concealed, setting: mA)	1
• With visible display (setting: mA)	6
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)	7

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

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

1) For oxygen application, add Order code E10.
2) Available soon
3) Version 7MF4233-1DY... only up to max. measuring span 200 mbar a (80 inH_2O a).
4) When also ordering the quality test 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.
5) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
6) The diaphragm seal is to be specified with a separate order number and must be included wiht the transmitter order number, for example 7MF423.-..Y..-.... and 7MF4900-1...-.B
7) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
8) Not in conjunction with Electrical connection "device plug Han 7D".
9) Without cable gland, with blanking plug.
10) With enclosed cable gland Ex ia and blanking plug.
11) Configurations with device plugs Han and M12 are only available in Ex ic.
12) Only in connection with IP66.
13) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
14) Only in connection with Ex apporval A, B or E.
15) Only in connection with Ex apporval A, B, E or F.
16) M12 delivered without cable socket

1

for absolute pressure (from gauge pressure series)

Selection and Ordering data		Article No.
Pressure transmitters for absolute pressure from gauge pressure series		
SITRANS P DS III with PROFIBUS PA (PA) ↗		7 M F 4 2 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF) ↗		7 M F 4 2 3 5 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		■■■■■ - ■■■■
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Inert liquid[1]	grease-free to cleanliness level 2	3
Nominal measuring range		
250 mbar a	(3.63 psi a)	D
1300 mbar a	(18.86 psi a)	F
5 bar a	(72.5 psi a)	G
30 bar a	(435 psi a)	H
160 bar a [2]	(2 321 psi a)	L
400 bar a [2]	(5 802 psi a)	M
700 bar a [2]	(10 153 psi a)	N
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" **(recommended version)** [3) 4) 5) 6) 7)]		Y 1
Version for diaphragm seals in conjunction with process connector "G½B connection shank"" [3) 4) 5) 6) 7)]		Y 0
Process connection		
• Connection shank G½B to EN 837-1		0
• Female thread ½-14 NPT		1
• Stainless steel oval flange with process connection (Oval flange has no female thread)		
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518		2
- Mounting thread M10 to DIN 19213		3
- Mounting thread M12 to DIN 19213		4
• Male thread M20 x 1.5		5
• Male thread ½ -14 NPT		6
Non-wetted parts materials		
• Enclosure made of die-cast aluminium		0
• Enclosure stainless steel precision casting		3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		

Selection and Ordering data	Article No.
Pressure transmitters for absolute pressure from gauge pressure series	
SITRANS P DS III with PROFIBUS PA (PA)	7 M F 4 2 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)	7 M F 4 2 3 5 -
	■■■■■ - ■■■■
Explosion protection	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)"[8)]	D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[9)]	P
- "Ex nA/ic (Zone 2)" [10)]	E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[9) 11)]	R
• FM + CSA intrinsic safe (is)[12)]	F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[9)11)12)]	S
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)"[8)12)]	N C
Electrical connection/cable entry	
• Screwed gland M20 x 1.5	B
• Screwed gland ½-14 NPT	C
• Device plugs M12 (stainless steel)[13) 14)]	F
Display	
• Without display	0
• Without visible display (display concealed, setting: bar)	1
• With visible display (setting: bar)	6
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)	7

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

1) For oxygen application, add Order code E10.
2) Available soon
3) Version 7MF4233-1DY... only up to max. measuring span 200 mbar a (2.9 psi a).
4) When also ordering the quality test 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.
5) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
6) The diaphragm seal is to be specified with a separate order number and must be included wiht the transmitter order number, for example 7MF423.-..Y..-.... and 7MF4900-1...-.B
7) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
8) Without cable gland, with blanking plug.
9) With enclosed cable gland Ex ia and blanking plug.
10) Configurations with device plugs Han and M12 are only available in Ex ic.
11) Only in connection with IP66.
12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
13) Only in connection with Ex approval A, B, E or F.
14) M12 delivered without cable socket.

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Article No. and specify Order code.				
Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:				
• Steel	**A01**	✓	✓	✓
• Stainless steel 304	**A02**	✓	✓	✓
• Stainless steel 316L	**A03**	✓	✓	✓
Device plugs[1]				
• Han 7D (metal)	**A30**	✓		
• Han 8D (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
• Han 8D (metal)	**A33**	✓		
Cable sockets for device plugs M12 (metal (CuZn))	**A50**	✓	✓	✓
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
• Cyrillic (russian)	**B16**	✓	✓	✓
English rating plate Pressure units in inH_20 and/or psi	**B21**	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)[2]	**C11**	✓	✓	✓
Inspection certificate[3] Acc. to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	**C14**	✓	✓	✓
Inspection certificate (EN 10204-3.1) PMI test of parts in contact with medium	**C15**	✓	✓	✓
Functional safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C20**	✓		
Functional safety (PROFIsafe) Certificate and PROFIsafe protocol	**C21**[4]		✓	
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C23**	✓		
PED for Russia with initial calibration mark	**C99**	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	✓		
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)	**D07**	✓	✓	✓
Degree of protection IP66/IP68 (only for 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**	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	**D59**	✓	✓	✓
Use in or on zone 1D/2D[5] (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-.B.. Ex ia) and IP65)	**E01**	✓	✓	✓
Oxygen application (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))	**E10**	✓	✓	✓
Export approval Korea	**E11**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Article No. and specify Order code.				
CRN approval Canada (Canadian Registration Number)	**E22**[6]	✓	✓	✓
Dual seal	**E24**	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.B..)	**E25**[7]	✓	✓	✓
"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.D..)	**E26**[7]	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.P..)	**E28**[7]	✓	✓	
Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-.B..)	**E45**[7]	✓	✓	✓
Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-.D..)	**E46**[7]	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-.B..)	**E55**[7]	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-.D..)	**E56**[7]	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.E..)	**E57**[7]	✓	✓	✓
Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.R..)	**E58**[7]	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-.[B, D]..-Z + E11)	**E70**[7]	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)	**E80**	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)	**E81**	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	**E82**	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	**E83**	✓	✓	✓
Two coats of lacquer on enclosure and cover (PU on epoxy)	**G10**	✓	✓	✓
Transient protector 6 kV (lightning protect.)	**J01**	✓	✓	✓
Oval flange NAM (ASTAVA)	**J06**	✓	✓	✓
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	**S10**	✓	✓	✓
• Lloyds Register (LR)	**S11**	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	**S12**	✓	✓	✓
• American Bureau of Shipping (ABS)	**S14**	✓	✓	✓
• Russian Maritime Register (RMR)	**S16**	✓	✓	✓
• Korean Register of Shipping (KR)	**S17**	✓	✓	✓

1) Device plug Han IP65

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

4) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H.

5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

6) Cannot be ordered with remote seal.

7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

for absolute pressure (from gauge pressure series)

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

Factory mounting of valve manifolds, see accessories.

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

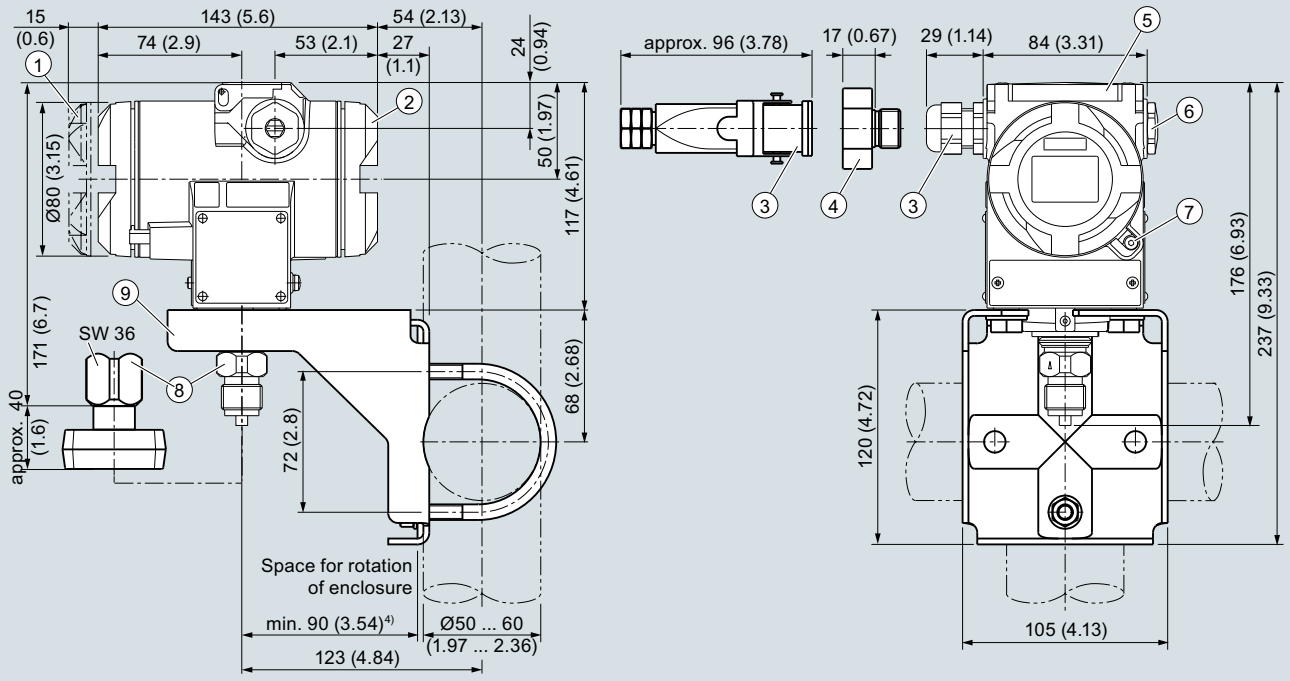
✓ = available

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

2) Only absolute pressure units selectable. Negative pressure values not permitted.

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 M20 x 1,5 or Screwed gland ½-14 NPT or Han 7D/8D device plug[2] [3]
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 G½B 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) Minimum distance for rotating

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

Technical specifications

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

Input			
Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or nominal measuring range, max. operating pressure (in accordance with 97/23/EC Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**	
	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)
	8.34 ... 250 mbar a 0.834 ... 25 kPa a 3 ... 100 inH_2O a	250 mbar a 25 kPa a 100 inH_2O a	32 bar a 3.2 MPa a 464 psi a
	43.34 ... 1300 mbar a 4.33 ... 130 kPa a 17 ... 525 inH_2O a	1300 mbar a 130 kPa a 525 inH_2O a	32 bar a 3.2 MPa a 464 psi a
	170 ... 5000 mbar a 17 ... 500 kPa a 2.43 ... 72.5 psi a	5000 mbar a 500 kPa a 72.5 psi a	32 bar a 3.2 MPa a 464 psi a
	1 ... 30 bar a 0.1 ... 3 MPa a 14.6 ... 435 psi a	30 bar a 3 MPa a 435 psi a	160 bar a 16 MPa a 2320 psi a
	5.3 ... 100 bar a 0.5 ... 10 MPa a 76.9 ... 1450 psi a	100 bar a 10 MPa a 1450 psi a	160 bar a 16 MPa a 2320 psi a
Lower measuring limit			
• Measuring cell with silicone oil filling	0 mbar a/0 kPa a/0 psi a		
• Measuring cell with inert filling liquid			
- for temperature of medium -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)	30 mbar a/3 kPa a/0.44 psi a		
- for temperature of medium 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))	30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C 3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C 0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F		
Upper measuring limit	100 % of max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)		
Lower range value	Between the measuring limits (fully adjustable)		
Output	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**	
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal	
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-	
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-	
Load			
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V	-	
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)	-	
Physical bus	-	IEC 61158-2	
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.		
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)		

SITRANS P, DS III for absolute pressure (from the differential pressure series)	
Measuring accuracy	Acc. to IEC 60770-1
Reference conditions (All error data refer always refer to the set span)	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Silicone oil filling • Room temperature 25 °C (77 °F)
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range
Error in measurement at limit setting incl. hysteresis and reproducibility	
• Linear characteristic	
- r ≤ 10	≤ 0.1 %
- 10 < r ≤ 30	≤ 0.2 %
Influence of ambient temperature (in percent per 28 °C (50 °F))	
• 250 mbar a/25 kPa a/3.6 psi a	≤ (0.15 · r + 0.1) %
• 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 100 bar a/10 MPa a/1450 psi a	≤ (0.08 · r + 0.16) %
Long-term stability (temperature change ± 30 °C (± 54 °F))	≤ (0.25 · r) % in 5 years
Effect of mounting position (in pressure per change in angle)	≤ 0.7 mbar/0.07 kPa/0.010 psi per 10° inclination (zero point correction is possible with position error compensation)
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range
Operating conditions	
Degree of protection	
• according to EN 60529	IP66 (optional IP66/IP68)
• according to NEMA 250	Type 4X
Temperature of medium	
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)
Ambient conditions	
• Ambient temperature	
- Transmitter	-40 ... +85 °C (-40 ... +185 °F)
- Display readable	-30 ... +85 °C (-22 ... +185 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
• Climatic class	
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics
• Electromagnetic Compatibility	
- Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21

for absolute pressure (from differential pressure series)

SITRANS P, DS III for absolute pressure (from the differential pressure series)		
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. 2.4602 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 100 bar (1450 psi) 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/DIN EN 61518	
Material of mounting bracket		
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)	
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)	
Power supply U_H	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate supply voltage	-	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 (from the differential pressure series)		
Certificates and approvals	**HART**	**PROFIBUS PA/ FOUNDATION Field-bus**
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 13 ATEX 2007 X	
- Marking	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC	To circuits with values: U_H = 9 ... 32 V DC
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 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 Ex tb IIIC T120°C Db	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC; P_{max} = 1.2 W	To circuits with values: U_H = 9 ... 32 V DC; P_{max} = 1 W
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	U_m = 45 V	U_m = 32 V
- Connection (Ex ic)	To circuits with values: U_i = 45 V	FISCO supply unit ic: U_o = 17.5 V, I_o = 570 mA Linear barrier: U_o = 32 V, I_o = 132 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion protection acc. to FM	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	

for absolute pressure (from differential pressure series)

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

FOUNDATION Fieldbus communication	
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic
- Electrical damping, adjustable	0 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

Selection and Ordering data		Article No.
Pressure transmitters for absolute pressure from differential pressure series, SITRANS P DS III with HART		7MF4333-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Inert liquid[1]	grease-free to cleanliness level 2	3
Measuring span (min. ... max.)		
8.34 ... 250 mbar a	(0.13 ... 3.63 psi a)	D
43.34 ... 1300 mbar a	(0.63 ... 18.86 psi a)	F
0.17 ... 5 bar a	(2.43 ... 72.5 psi a)	G
1 ... 30 bar a	(14.6 ... 435 psi a)	H
5.3 ... 100 bar a	(76.9 ... 1450 psi a)	K E
Wetted parts materials		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Tantalum	Tantalum	E
Monel	Monel	H
Gold	Gold	L
Version for diaphragm seal[2) 3) 4) 5) 6)]		Y
Process connection		
Female thread ¼-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518		2
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		0
• Vent on side of process flange [7)]		
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518		6
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		4
Non-wetted parts materials		
process flange screws	Electronics enclosure	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting[8)]	3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
- "Explosion-proof (Ex d)"[9)]		D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" [10)]		P
- "Ex nA/ic (Zone 2)"[11)]		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"[10)12)]		R
• FM + CSA intrinsic safe (is)[13)]		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[10)12)13)]		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)" [9)13)]		N C

Selection and Ordering data	Article No.
Pressure transmitters for absolute pressure from differential pressure series, SITRANS P DS III with HART	7MF4333-
Electrical connection/cable entry	
• Screwed gland M20 x 1.5	B
• Screwed gland ½-14 NPT	C
• Device plug Han 7D (plastic enclosure) incl. mating connector[14)]	D
• Device plugs M12 (stainless steel) [15) 16)]	F
Display	
• Without display	0
• Without visible display (display concealed, setting: mA)	1
• With visible display (setting: mA)	6
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)	7

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

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

1) For oxygen applications, add Order code E10.
2) Version 7MF4333-1DY... only up to max. measuring span 200 mbar a (2.9 psi a).
3) When also ordering the quality test 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.
4) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
5) The diaphragm seal is to be specified with a separate order number and must be included wiht the transmitter order number, for example 7MF433.-..Y..-.... and 7MF4900-1...-.B
6) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
7) Not for measuring span "5.3 ... 100 bar a (76.9 ... 1450 psi a)". Position of the top vent valve in the process flange (see dimensional drawing).
8) Not in conjunction with Electrical connection "device plug Han 7D".
9) Without cable gland, with blanking plug
10) With enclosed cable gland Ex ia and blanking plug
11) Configurations with device plugs Han and M12 are only available in Ex ic.
12) Only in connection with IP66.
13) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
14) Only in connection with Ex apporval A, B or E.
15) Only in connection with Ex approval A, B, E or F.
16) M12 delivered without cable socket.

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for absolute pressure (from differential pressure series)

Selection and Ordering data	Article No.
Pressure transmitter for absolute pressure from differential pressure series	
SITRANS P DS III with PROFIBUS PA (PA) ↗	7MF4334-
SITRANS P DS III with FOUNDATION Fieldbus (FF) ↗	7MF4335-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	■■■■■-■■■■
Measuring cell filling / **Measuring cell cleaning**	
Silicone oil / normal	1
Inert liquid[1] / grease-free to cleanliness level 2	3
Nominal measuring range	
250 mbar a (3.63 psi a)	D
1300 mbar a (18.86 psi a)	F
5 bar a (72.5 psi a)	G
30 bar a (435 psi a)	H
100 bar a (1450 psi a)	K E
Wetted parts materials Seal diaphragm / Parts of measuring cell	
Stainless steel / Stainless steel	A
Hastelloy / Stainless steel	B
Hastelloy / Hastelloy	C
Tantalum / Tantalum	E
Monel / Monel	H
Gold / Gold	L
Version as diaphragm seal [2) 3) 4) 5) 6)]	Y
Process connection	
Female thread ¼-18 NPT with flange connection	
• Sealing screw opposite process connection	
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518	2
- Mounting thread M10 to DIN 19213 (only for replacement requirement)	0
• Vent on side of process flange [7)]	
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518	6
- Mounting thread M10 to DIN 19213 (only for replacement requirement)	4
Non-wetted parts materials process flange screws / Electronics enclosure	
Stainless steel / Die-cast aluminum	2
Stainless steel / Stainless steel precision casting	3
Version	
• Standard version, German plate inscription, setting for pressure unit: bar	1
• International version, English plate inscription, setting for pressure unit: bar	2
• Chinese version, English plate inscription, setting for pressure unit: Pascal	3
All versions include DVD with compact operating instructions in various EU languages.	
Explosion protection	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)"[8)]	D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)" [9)]	P
- "Ex nA/ic (Zone 2)"[10)]	E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[9) 11)]	R
• FM + CSA intrinsic safe (is)[12)]	F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[9)11)12)]	S
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)" [8)12)]	NC

Selection and Ordering data	Article No.
Pressure transmitter for absolute pressure from differential pressure series	
SITRANS P DS III with PROFIBUS PA (PA)	7MF4334-
SITRANS P DS III with FOUNDATION Fieldbus (FF)	7MF4335-
	■■■■-■■■■
Electrical connection/cable entry	
• Screwed gland M20 x 1.5	B
• Screwed gland ½-14 NPT	C
• Device plugs M12 (stainless steel)[13)14)]	F
Display	
• Without display	0
• Without visible display (display concealed, setting: bar)	1
• With visible display (setting: bar)	6
• With customer-specific display (setting as specified, Order code "Y21" required)	7

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

1) For oxygen application, add Order code E10.
2) Version 7MF4334-1DY... only up to max. measuring span 200 mbar a (80 inH_2O a).
3) When also ordering the quality test 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.
4) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
5) The diaphragm seal is to be specified with a separate order number and must be included wiht the transmitter order number, for example 7MF433.-..Y..-.... and 7MF4900-1...-.B
6) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
7) Not for nominal measuring range 100 bar a (1450 psi a). Position of the top vent valve in the process flange (see dimensional drawing).
8) Without cable gland, with blanking plug
9) With enclosed cable gland Ex ia and blanking plug
10) Configurations with device plugs Han and M12 are only available in Ex ic.
11) Only in connection with IP66.
12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
13) 11Only in connection with Ex approval A, B, E or F.
14) M12 delivered without cable socket

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:				
• Steel	**A01**	✓	✓	✓
• Stainless steel 304	**A02**	✓	✓	✓
• Stainless steel 316L	**A03**	✓	✓	✓
O-rings for process flanges (instead of FPM (Viton))				
• PTFE (Teflon)	**A20**	✓	✓	✓
• FEP (with silicone core, approved for food)	**A21**	✓	✓	✓
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	**A22**	✓	✓	✓
• NBR (Buna N)	**A23**	✓	✓	✓
Device plugs[1]				
• Han 7D (metal)	**A30**	✓		
• Han 8D (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
• Han 8D (metal)	**A33**	✓		
Sealing screw ¼-18 NPT, with vent valve in mat. of process flanges	**A40**	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))	**A50**	✓	✓	✓
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
• Cyrillic (russian)	**B16**	✓	✓	✓
English rating plate Pressure units in in$H_2$0 and/or psi	**B21**	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)[2]	**C11**	✓	✓	✓
Inspection certificate[3] Acc. to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	**C14**	✓	✓	✓
Inspection certificate (EN 10204-3.1) PMI test of parts in contact with medium	**C15**	✓	✓	✓
Functional safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C20**	✓		
Functional safety (PROFIsafe) Certificate and PROFIsafe protocol	**C21**[4]		✓	
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C23**	✓		
PED for Russia with initial calibration mark	**C99**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	✓		
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	**D07**	✓	✓	✓
Degree of protection IP66/IP68 (only for M20 x 1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Supplied with oval flange (1 item), PTFE packing and screws in thread of process flange	**D37**	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	**D59**	✓	✓	✓

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for absolute pressure (from differential pressure series)

Selection and Ordering data	Order code			
Further designs Add "**-Z**" to Article No. and specify Order code.		HART	PA	FF
Use in or on zone 1D/2D[5]	**E01**	✓	✓	✓
(only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-.B.. Ex ia)" and IP66)				
Oxygen application	**E10**	✓	✓	✓
(In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))				
Export approval Korea	**E11**	✓	✓	✓
CRN approval Canada (Canadian Registration Number)	**E22**[6]	✓	✓	✓
Dual seal	**E24**	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil)	**E25**[7]	✓	✓	✓
(only for transmitter 7MF4...-.....-.B..)				
"Flameproof" explosion protection according to INMETRO (Brazil)	**E26**[7]	✓	✓	✓
(only for transmitter 7MF4...-.....-.D..)				
Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil)	**E28**[7]	✓	✓	
(only for transmitter 7MF4...-.....-.P..)				
Ex Approval IEC Ex (Ex ia)	**E45**[7]	✓	✓	✓
(only for transmitter 7MF4...-.....-.B..)				
Ex Approval IEC Ex (Ex d)	**E46**[7]	✓	✓	✓
(only for transmitter 7MF4...-.....-.D..)				
Explosion-proof "Intrinsic safety" to NEPSI (China)	**E55**[7]	✓	✓	✓
(only for transmitter 7MF4...-.....-.B..)				
Explosion protection "Explosion-proof" to NEPSI (China)	**E56**[7]	✓	✓	✓
(only for transmitter 7MF4...-.....-.D..)				
Explosion-proof "Zone 2" to NEPSI (China)	**E57**[7]	✓	✓	✓
(only for transmitter 7MF4...-.....-.E..)				
Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China)	**E58**[7]	✓	✓	✓
(only for transmitter 7MF4...-.....-.R..)				
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea)	**E70**[7]	✓	✓	✓
(only for transmitter 7MF4...-.....-.[B, D]..-Z + E11)				
Ex-protection Ex ia according to EAC Ex (Russia)	**E80**	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)	**E81**	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	**E82**	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	**E83**	✓	✓	✓
Two coats of lacquer on enclosure and cover (PU on epoxy)	**G10**	✓	✓	✓
Interchanging of process connection side	**H01**	✓	✓	✓
Vent on side for gas measurements	**H02**	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines	**H03**	✓	✓	✓
(not together with K01, K02 and K04)[8]				

Selection and Ordering data	Order code			
Further designs Add "**-Z**" to Article No. and specify Order code.		HART	PA	FF
Transient protector 6 kV (lightning protection)	**J01**	✓	✓	✓
Chambered graphite gasket for process flange	**J02**	✓	✓	✓
Chambered PTFE graphite gasket	**J03**	✓	✓	✓
EPDM O-rings for process flange with approval (WRC/WRAS)	**J05**	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)[9]	**J08**	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)[9]	**J09**	✓	✓	✓
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) For ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible	**K04**	✓	✓	✓
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	**S10**	✓	✓	✓
• Lloyds Register (LR)	**S11**	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	**S12**	✓	✓	✓
• American Bureau of Shipping (ABS)	**S14**	✓	✓	✓
• Russian Maritime Register (RMR)	**S16**	✓	✓	✓
• Korean Register of Shipping (KR)	**S17**	✓	✓	✓

1) Device plug Han IP65

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

4) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

6) Cannot be ordered with remote seal.

7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

8) Not suitable for connection of remote seals.

9) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

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

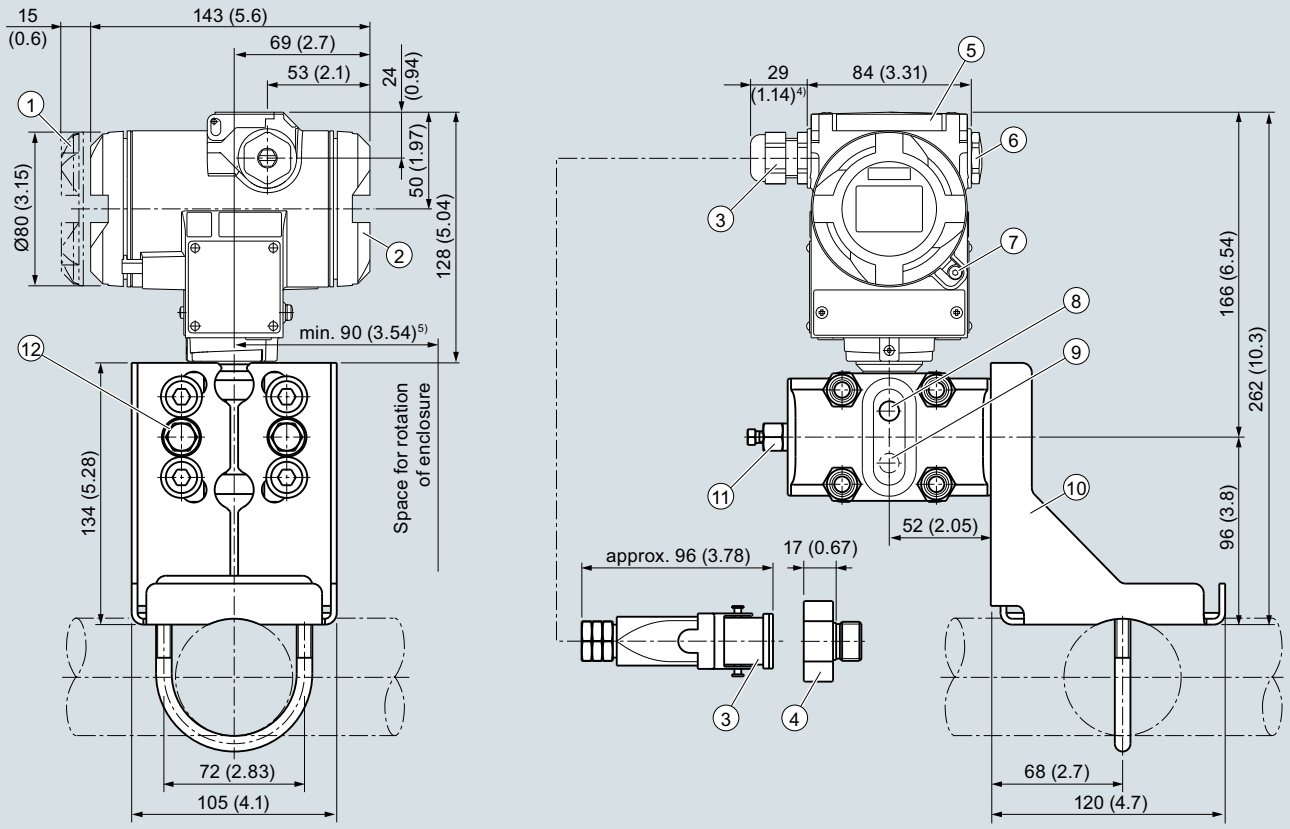
Factory mounting of valve manifolds, see accessories.

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

✓ = available

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.
2) Only absolute pressure units selectable. Negative pressure values not permitted.
3) Preset values can only be changed over SIMATIC PDM.

Dimensional drawings



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

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

SITRANS 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

Input

Measured variable: Differential pressure and flow

Measuring span (infinitely adjustable) or nominal measuring range and maximum operating pressure (pursuant to 2014/68/EU Pressure Equipment Directive)

HART	**PROFIBUS PA/ FOUNDATION Fieldbus**	
Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)
1 ... 20 mbar 0.1 ... 2 kPa 0.4 ... 8 inH_2O	20 mbar 2 kPa 8 inH_2O	32 bar 3.2 MPa 464 psi
1 ... 60 mbar 0.1 ... 6 kPa 0.4 ... 24 inH_2O	60 mbar 6 kPa 24.1 inH_2O	160 bar 16 MPa 2320 psi
2.5 ... 250 mbar 0.2 ... 25 kPa 1 ... 100 inH_2O	250 mbar 25 kPa 100 inH_2O	
6 ... 600 mbar 0.6 ...60 kPa 2.4 ... 240 inH_2O	600 mbar 60 kPa 240 inH_2O	
16 ... 1600 mbar 1.6 ...160 kPa 6.4 ... 642 inH_2O	1600 mbar 160 kPa 642 inH_2O	
50 ... 5000 mbar 5 ...500 kPa 20 ... 2000 inH_2O	5000 mbar 500 kPa 2000 inH_2O	
0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi	
2.5 ... 250 mbar 0.2 ... 25 kPa 1 ... 100 inH_2O	250 mbar 25 kPa 100 inH_2O	420 bar 42 MPa 6091 psi
6 ... 600 mbar 0.6 ...60 kPa 2.4 ... 240 inH_2O	600 mbar 60 kPa 240 inH_2O	(500 bar/50 MPa/7250 psi can be ordered optionally with Order Code D56)
16 ... 1600 mbar 1.6 ...160 kPa 6.4 ... 642 inH_2O	1600 mbar 160 kPa 642 inH_2O	
50 ... 5000 mbar 5 ...500 kPa 20 ... 2000 inH_2O	5000 mbar 500 kPa 2000 inH_2O	
0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi	

Lower measuring limit

- Measuring cell with silicone oil filling: -100 % of max. measuring span (-33 % with measuring cell 30 bar/3 MPa/435 psi) or 30 mbar a/3 kPa a/0.44 psi a
- Measuring cell with inert filling liquid
  - for temperature of medium -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F): -100 % of max. measuring span (-33 % with measuring cell 30 bar/3 MPa/435 psi) or 30 mbar a/3 kPa a/0.44 psi a
  - for temperature of medium 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi)): 30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C
3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C
0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F

Upper measuring limit: 100 % of max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)

Lower range value: Between the measuring limits (fully adjustable)

SITRANS P, DS III for differential pressure and flow		
Output	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA (with order code D05)	-
Load		
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V	-
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)	-
Physical bus	-	IEC 61158-2
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.	
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)	
Measuring accuracy	Acc. to IEC 60770-1	
Reference conditions (All error data refer always refer to the set span)	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Silicone oil filling • Room temperature 25 °C (77 °F)	
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range	
Error in measurement at limit setting incl. hysteresis and reproducibility		
• Linear characteristic		
- 20 mbar/2 kPa/0.29 psi	r ≤ 5 : ≤ 0.075 % 5 < r ≤ 10 : ≤ (0.0029 · r + 0.071) % 10 < r ≤ 20 : ≤ (0.0045 · r + 0.071) %	
- 60 mbar/6 kPa/0.87 psi	r ≤ 5 : ≤ 0.075 % 5 < r ≤ 60 : ≤ (0.005 · r + 0.05) %	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5 : ≤ 0.065 % 5 < r ≤ 100 : ≤ (0.004 · r + 0.045) %	
• Square-rooted characteristic (flow > 50 %)		
- 20 mbar/2 kPa/0.29 psi	r ≤ 5 : ≤ 0.075 % 5 < r ≤ 10 : ≤ (0.0029 · r + 0.071) % 10 < r ≤ 20 : ≤ (0.0045 · r + 0.071) %	
- 60 mbar/6 kPa/0.87 psi	r ≤ 5 : ≤ 0.075 % 5 < r ≤ 60 : ≤ (0.005 · r + 0.05) %	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5 : ≤ 0.065 % 5 < r ≤ 100 : ≤ (0.004 · r + 0.045) %	
• Square-rooted characteristic (flow > 25 ... 50 %)		
- 20 mbar/2 kPa/0.29 psi	r ≤ 5 : ≤ 0.15 % 5 < r ≤ 10 : ≤ (0.0058 · r + 0.142) % 10 < r ≤ 20 : ≤ (0.009 · r + 0.142) %	
- 60 mbar/6 kPa/0.87 psi	r ≤ 5 : ≤ 0.015 % 5 < r ≤ 60 : ≤ (0.01 · r + 0.1) %	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	r ≤ 5 : ≤ 0.13 % 5 < r ≤ 100 : ≤ (0.008 · r + 0.09) %	

SITRANS P, DS III for differential pressure and flow	
Measuring accuracy (continued)	Acc. IEC 60770-1
Influence of ambient temperature (in percent per 28 °C (50 °F))	
• 20 mbar/2 kPa/0.29 psi	≤ (0.15 · r + 0.1) %
• 60 mbar/6 kPa/0.87 psi	≤ (0.075 · r + 0.1) %
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	≤ (0.025 · r + 0.125) %
Influence of static pressure	
• on the lower range value	
- 20 mbar/2 kPa/0.29 psi	≤ (0.15 · r) % per 32 bar (zero offset is possible with position error adjustment)
- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi	≤ (0.1 · r) % per 70 bar (zero offset is possible with position error adjustment)
- 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	≤ (0.2 · r) % per 70 bar (zero offset is possible with position error adjustment)
• on the measuring span	
- 20 mbar/2 kPa/0.29 psi	≤ 0.2 % per 32 bar
- 60 mbar/6 kPa/0.87 psi 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	≤ 0.14 % per 70 bar
Long-term stability (temperature change ± 30 °C (± 54 °F))	Static pressure max. 70 bar/7 MPa/ 1015 psi
• 20 mbar/2 kPa/0.29 psi	≤ (0.2 · r) % per year
• 60 mbar/6 kPa/0.87 psi 30 bar/3 MPa/435 psi	≤ (0.25 · r) % in 5 years
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi	≤ (0.125 · r) % in 5 years
Effect of mounting position (in pressure per change in angle)	≤ 0.7 mbar/0.07 kPa/0.028 inH_2O per 10° inclination (zero offset is possible with position error adjustment)
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range

SITRANS P, DS III for differential pressure and flow		
Operating conditions		
Degree of protection		
• according to EN 60529	IP66 (optional IP66/IP68)	
• according to NEMA 250	Type 4X	
Temperature of medium		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) with 30 bar measuring cell	
• Measuring cell with inert filling liquid	-20 ... +100 °C (-4 ... +212 °F)	
• Measuring cell with Neobee fill fluid (FDA-compliant)	-10 ... +100 °C (+14 ... +212 °F)	
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
• Ambient temperature (silicone oil and inert oil)		
- Transmitter	-40 ... +85 °C (-40 ... +185 °F) -20 ... +85 °C (-4 ... +185 °F) with 30 bar measuring cell	
- Display readable	-30 ... +85 °C (-22 ... +185 °F)	
• Ambient temperature (Neobee fill fluid)		
- Transmitter	-10 ... +85 °C (+14 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
• Electromagnetic Compatibility		
- Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21	
Design		
Weight (without options)	Die-cast aluminum: ≈ 4.5 kg (≈ 9.9 lb) Stainless steel precision casting: ≈ 7.1 kg (≈ 15.6 lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AlSi12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold	
• Process flanges and sealing screw	Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602 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 oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))	
Process connection	Female thread ¼-18 NPT and flange connection with mounting thread M10 to DIN 19213 or $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518	
Material of mounting bracket		
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)	
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)	
Power supply U_H	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply	-	Supplied through bus
Separate supply voltage	-	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 differential pressure and flow		
Certificates and approvals	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**
Classification according to PED 2014/68/EU	• PN 32/160 (MAWP 464/2320 psi) for gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice) • PN 420 (MAWP 6092) for gases of fluid group 1 and liquids of fluid group 1; complies with basic safety requirements of Article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord.	
Explosion protection		
• Intrinsic safety "i"	PTB 13 ATEX 2007 X	
- Marking	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC	To circuits with values: U_H = 9 ... 32 V DC
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Dust explosion protection for zone 21/22	PTB 01 ATEX 2055	
- Marking	Ex II 2 D Ex tb IIIC T120°C Db	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC; P_{max} = 1.2 W	To circuits with values: U_H = 9 ... 32 V DC; P_{max} = 1 W
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	U_m = 45 V	U_m = 32 V
- Connection (Ex ic)	To circuits with values: U_i = 45 V	FISCO supply unit ic: U_o = 17.5 V, I_o = 570 mA Linear barrier: U_o = 32 V, I_o = 132 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion protection acc. to FM	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	

for differential pressure and flow

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

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

Selection and Ordering data		Article No.
SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi)	↗	7MF4433 -
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Inert liquid[1]	grease-free to cleanliness level 2	3
FDA compliant fill fluid [2]		
• Neobee oil	normal	4
Measuring span (min. ... max.)		
PN 32 (MAWP 464 psi)		
1 ... 20 mbar[3]	(0.4 ... 8 inH_2O)	B
PN 160 (MAWP 2320 psi)		
1 ... 60 mbar	(0.4 ... 24 inH_2O)	C
2.5 ... 250 mbar	(1.004 ... 100.4 inH_2O)	D
6 ... 600 mbar	(2.4 ... 240 inH_2O)	E
16 ... 1600 mbar	(6.4 ... 642 inH_2O)	F
50 ... 5000 mbar	(20 ... 2000 inH_2O)	G
0.3 ... 30 bar	(4.35 ... 435 psi)	H
Wetted parts materials		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Tantalum[4]	Tantalum	E
Monel[4]	Monel	H
Gold[4]	Gold	L
Version for diaphragm seal[5] [6] [7] [8]		Y
Process connection		
Female thread ¼-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		2
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		0
• Vent on side of process flange [3]		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		6
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		4
Non-wetted parts materials		
process flange screws	Electronics enclosure	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting[9]	3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		

Selection and Ordering data	Article No.
SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 32/160 (MAWP 464/2320 psi)	7MF4433 -
Explosion protection	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)"[10]	D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[11]	P
- "Ex nA/ic (Zone 2)"[12]	E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"[11][13]	R
• FM + CSA intrinsic safe (is)[14]	F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[11][13][14]	S
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)"[10][14]	N C
Electrical connection/cable entry	
• Screwed gland M20 x 1.5	B
• Screwed gland ½-14 NPT	C
• Device plug Han 7D (plastic enclosure) incl. mating connector[15][16]	D
• Device plugs M12 (stainless steel)[17][18]	F
Display	
• Without display	0
• Without visible display (display concealed, setting: mA)	1
• With visible display (setting: mA)	6
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)	7

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

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

1) For oxygen application, add Order code E10.

2) Available for measuring ranges 250 mbar ... 5 bar.

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

4) Not in conjunction with max. measuring span 20 and 60 mbar (8.03 and 24.09 inH_2O))

5) When also ordering the quality test 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.

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

7) The diaphragm seal is to be specified with a separate order number and must be included wiht the transmitter order number, for example 7MF443.-..Y..-.... and 7MF4900-1...-.B

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

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

10) Without cable gland, with blanking plug

11) With enclosed cable gland Ex ia and blanking plug

12) Configurations with device plugs Han and M12 are only available in Ex ic.

13) Only in connection with IP66.

14) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.

15) Only in connection with Ex apporval A, B or E.

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

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

18) M12 delivered without cable socket.

1

for differential pressure and flow

Selection and Ordering data	Article No.
Pressure transmitters for differential pressure and flow PN 32/160 (MAWP 464/2320 psi)	
SITRANS P DS III with PROFIBUS PA (PA) ↗	**7MF4434-**
SITRANS P DS III with FOUNDATION Fieldbus (FF) ↗	**7MF4435-**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	■■■■■-■■■■
Measuring cell filling / **Measuring cell cleaning**	
Silicone oil / normal	1
Inert liquid[1] / grease-free to cleanliness level 2	3
FDA compliant fill fluid [2]	
• Neobee oil / normal	4
Nominal measuring range	
PN 32 (MAWP 464 psi)	
20 mbar [3] / (8.03 inH_2O)	B
PN 160 (MAWP 2320 psi)	
60 mbar / (24 inH_2O)	C
250 mbar / (100 inH_2O)	D
600 mbar / (240 inH_2O)	E
1600 mbar / (642 inH_2O)	F
5 bar / (2000 inH_2O)	G
30 bar / (435 psi)	H
Wetted parts materials	
(stainless steel process flanges)	
Seal diaphragm / Parts of measuring cell	
Stainless steel / Stainless steel	A
Hastelloy / Stainless steel	B
Hastelloy / Hastelloy	C
Tantalum [4] / Tantalum	E
Monel[4] / Monel	H
Gold [4] / Gold	L
Version as diaphragm seal [5] [6] [7] [8]	Y
Process connection	
Female thread ¼-18 NPT with flange connection	
• Sealing screw opposite process connection	
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518	2
- Mounting thread M10 to DIN 19213 (only for replacement requirement)	0
• Venting on side of process flanges[3]	
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518	6
- Mounting thread M10 to DIN 19213 (only for replacement requirement)	4
Non-wetted parts materials	
process flange screws / Electronics enclosure	
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 DVD (no Order code selectable)	2
Version	
• Standard version, German plate inscription, setting for pressure unit: bar	1
• International version, English plate inscription, setting for pressure unit: bar	2
• Chinese version, English plate inscription, setting for pressure unit: Pascal	3
All versions include DVD with compact operating instructions in various EU languages.	

Selection and Ordering data	Article No.
Pressure transmitters for differential pressure and flow PN 32/160 (MAWP 464/2320 psi)	
SITRANS P DS III with PROFIBUS PA (PA)	**7MF4434-**
SITRANS P DS III with FOUNDATION Fieldbus (FF)	**7MF4435-**
	■■■■-■■■■
Explosion protection	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)"[9]	D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[10]	P
- "Ex nA/ic (Zone 2)" [11]	E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[10][12]	R
• FM + CSA intrinsic safe (is)[13]	F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX)+ Zone 1D/2D[10][12][13]	S
• With FM + CSA, Type of protection:	
- "Intrinsic Safe and Explosion Proof (is + xp)"[9][13]	NC
Electrical connection/cable entry	
• Screwed gland M20 x 1.5	B
• Screwed gland ½-14 NPT	C
• Device plugs M12 (stainless steel)[14] [15]	F
Display	
• Without display	0
• Without visible display (display concealed, setting: bar)	1
• With visible display (setting: bar)	6
• With customer-specific display (setting as specified, Order code "Y21" required)	7

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

1) For oxygen application, add Order code E10.
2) Available for measuring ranges 250 mbar ... 5 bar.
3) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).
4) Not in conjunction with max. measuring span 20 and 60 mbar (8.03 and 24.09 inH_2O))
5) 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.
6) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
7) The diaphragm seal is to be specified with a separate order number and must be included wiht the transmitter order number, for example 7MF443.-..Y..-.... and 7MF4900-1...-.B
8) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
9) Without cable gland, with blanking plug.
10) With enclosed cable gland Ex ia and blanking plug.
11) Configurations with device plugs Han and M12 are only available in Ex ic.
12) Only in connection with IP66.
13) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
14) Only in connection with Ex approval A, B, E or F.
15) M12 delivered without cable socket

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:				
• Steel	**A01**	✓	✓	✓
• Stainless steel 304	**A02**	✓	✓	✓
• Stainless steel 316L	**A03**	✓	✓	✓
O-rings for process flanges (instead of FPM (Viton))				
• PTFE (Teflon)	**A20**	✓	✓	✓
• FEP (with silicone core, approved for food)	**A21**	✓	✓	✓
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	**A22**	✓	✓	✓
• NBR (Buna N)	**A23**	✓	✓	✓
Device plugs[1]				
• Han 7D (metal)	**A30**	✓		
• Han 8D (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
• Han 8D (metal)	**A33**	✓		
Sealing screws (2 units) ¼-18 NPT, with vent valve in mat. of process flanges	**A40**	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))	**A50**	✓	✓	✓
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
• Cyrillic (russian)	**B16**	✓	✓	✓
English rating plate Pressure units in inH_2O and/or psi	**B21**	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)[2]	**C11**	✓	✓	✓
Inspection certificate[3] to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate to EN 10204-2.2	**C14**	✓	✓	✓
Inspection certificate (EN 10204-3.1) PMI test of parts in contact with medium	**C15**	✓	✓	✓
Functional safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C20**	✓		
Functional safety (PROFIsafe) Certificate and PROFIsafe protocol	**C21**[4]		✓	
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C23**	✓		
PED for Russia with initial calibration mark	**C99**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	✓		
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	**D07**	✓	✓	✓
Degree of protection IP66/IP68 (only for M20 x 1.5 and ½-14 NPT)	**D12**	✓	✓	✓
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**	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	**D59**	✓	✓	✓
Use in or on zone 1D/2D[5]	**E01**	✓	✓	✓
(only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-.B.. Ex ia)"and IP66)				
Overfilling safety device for flammable and non-flammable liquids (max. PN 32 (MAWP 464 psi), basic device with type of protection "Intrinsic safety (Ex 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. 100 bar (1450 psi) at 60°C (140 °F))	**E10**	✓	✓	✓
Export approval Korea	**E11**	✓	✓	✓
CRN approval Canada (Canadian Registration Number)	**E22**[6]	✓	✓	✓
Dual seal	**E24**	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.B..)	**E25**[7]	✓	✓	✓
"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.D..)	**E26**[7]	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.P..)	**E28**[7]	✓	✓	
Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-.B..)	**E45**[7]	✓	✓	✓
Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-.D..)	**E46**[7]	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-.B..)	**E55**[7]	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-.D..)	**E56**[7]	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.E..)	**E57**[7]	✓	✓	✓
Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.R..)	**E58**[7]	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-.[B, D]..-Z + E11)	**E70**[7]	✓	✓	✓

for differential pressure and flow

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Ex-protection Ex ia according to EAC Ex (Russia)	**E80**	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)	**E81**	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	**E82**	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	**E83**	✓	✓	✓
Two coats of lacquer on enclosure 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[8])	**H03**	✓	✓	✓
Transient protector 6 kV (lightning protection)	**J01**	✓	✓	✓
Chambered graphite gasket for process flange	**J02**	✓	✓	✓
Chambered PTFE graphite gasket	**J03**	✓	✓	✓
EPDM O-rings for process flange with approval (WRC/WRAS)	**J05**	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display[9])	**J08**	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)[9]	**J09**	✓	✓	✓
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), for ½-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible	**K04**	✓	✓	✓
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	**S10**	✓	✓	✓
• Lloyds Register (LR)	**S11**	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	**S12**	✓	✓	✓
• American Bureau of Shipping (ABS)	**S14**	✓	✓	✓
• Russian Maritime Register (RMR)	**S16**	✓	✓	✓
• Korean Register of Shipping (KR)	**S17**	✓	✓	✓

Factory mounting of valve manifolds, see accessories.

✓ = available

1) Device plug Han IP65

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

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

4) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H

5) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

6) Cannot be ordered with remote seal.

7) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

8) Not suitable for connection of remote seal.

9) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

Selection and Ordering data	Order code	HART	PA	FF
Additional data Please add "**-Z**" to Article No. and specify Order code(s) and plain text.				
Measuring range to be set Specify in plain text:				
• in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	**Y01**	✓	✓[1]	
• in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	**Y02**	✓		
Stainless steel tag plate and entry in device variable (measuring point description) Max. 16 characters, specify in plain text: Y15:	**Y15**	✓	✓	✓
Measuring point text (entry in device variable) Max. 27 char., specify in plain text: Y16:	**Y16**	✓	✓	✓
Entry of HART address (TAG) Max. 8 char., specify in plain text: Y17:	**Y17**	✓		
Setting of pressure indicator in pressure units Specify in plain text (standard setting: bar): Y21: mbar, bar, kPa, MPa, psi, ... Note: The following pressure units can be selected: bar, mbar, mm H_2O*), inH_2O*), ftH_2O*), mmHG, inHG, psi, Pa, kPa, MPa, g/cm², kg/cm², Torr, ATM or % *) ref. temperature 20 °C	**Y21**	✓	✓	✓
Setting of pressure indicator in non-pressure units[2] Specify in plain text: Y22: ..... up to ..... l/min, m³/h, m, USgpm, ... (specification of measuring range in pressure units "Y01" or "Y02" is essential, unit with max. 5 characters)	**Y22[3]** + **Y01** *or* **Y02**	✓		
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	**Y25**		✓	✓
Damping adjustment in seconds (0 ... 100 s)	**Y30**	✓	✓	✓

Factory mounting of valve manifolds, see accessories.

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

✓ = available

1) Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.

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

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

Selection and Ordering data		Article No.
SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)	↗	**7MF4533 -**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	**1**
Inert liquid[1]	grease-free to cleanliness level 2	**3**
Measuring span (min. ... max.)		
2.5 ... 250 mbar	(1.004 ... 100 inH_2O)	**D**
6 ... 600 mbar	(2.4 ... 240 inH_2O)	**E**
16 ... 1600 mbar	(6.4 ... 642 inH_2O)	**F**
50 ... 5000 mbar	(20 ... 2000 inH_2O)	**G**
0.3 ... 30 bar	(4.35 ... 435 psi)	**H**
Wetted parts materials		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	**A**
Hastelloy	Stainless steel	**B**
Gold[2]	Gold	**L**
Version for diaphragm seal [3) 4) 5) 6)]		**Y**
Process connection		
Female thread ¼-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		**3**
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		**1**
• Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing)		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		**7**
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		**5**
Non-wetted parts materials		
process flange screws	Electronics enclosure	
Stainless steel	Die-cast aluminum	**2**
Stainless steel	Stainless steel precision casting[7)]	**3**
Version		
• Standard version, German plate inscription, setting for pressure unit: bar)		**1**
• International version, English plate inscription, setting for pressure unit: bar		**2**
• Chinese version, English plate inscription, setting for pressure unit: Pascal		**3**
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None		**A**
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		**B**
- "Explosion-proof (Ex d)"[8)]		**D**
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[9)]		**P**
- "Ex nA/ic (Zone 2)"[10)]		**E**
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"[9)11)]		**R**
• FM + CSA intrinsic safe (is)[12)]		**F**
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[9)11)12)]		**S**
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)" [8)12)], max PN 360		**NC**

Selection and Ordering data	Article No.
SITRANS P DS III with HART pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)	**7MF4533 -**
Electrical connection/cable entry	
• Screwed gland M20x1.5	**B**
• Screwed gland ½-14 NPT	**C**
• Device plug Han 7D (plastic enclosure) incl. mating connector[13)14)]	**D**
• Device plugs M12 (stainless steel)[15) 16)]	**F**
Display	
• Without display	**0**
• Without visible display (display concealed, setting: mA)	**1**
• With visible display (setting: mA)	**6**
• with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)	**7**

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

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

1) For oxygen application, add Order code E10.
2) Not in conjunction with max. measuring span 600 mbar (240.9 inH_2O)
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 inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
5) The diaphragm seal is to be specified with a separate order number and must be included wiht the transmitter order number, for example 7MF453.-..Y..-.... and 7MF4900-1....-.B
6) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
7) Not in conjunction with Electrical connection "device plug Han 7D".
8) Without cable gland, with blanking plug
9) With enclosed cable gland Ex ia and blanking plug
10) Configurations with device plugs Han and M12 are only available in Ex ic.
11) Only in connection with IP66.
12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
13) Only in connection with Ex approval A, B or E.
14) Permissible only for crimp-contact of conductor cross-section 1 mm^2
15) Only in connection with Ex approval A, B, E or F.
16) M12 delivered without cable socket.

for differential pressure and flow

Selection and Ordering data	Article No.
Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)	
SITRANS P DS III with PROFIBUS PA (PA) ↗	7MF4534-
SITRANS P DS III with FOUNDATION Fieldbus (FF) ↗	7MF4535-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	

Measuring cell filling	Measuring cell cleaning	
Silicone oil	normal	1
Inert liquid[1]	grease-free to cleanliness level 2	3
Nominal measuring range		
250 mbar	(100 inH_2O)	D
600 mbar	(240 inH_2O)	E
1600 mbar	(642 inH_2O)	F
5 bar	(2000 inH_2O)	G
30 bar	(435 psi)	H
Wetted parts materials		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Gold [2]	Gold	L
Version for diaphragm seal [3] [4] [5] [6]		Y
Process connection		
Female thread ¼-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		3
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		1
• Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing).		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		7
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		5
Non-wetted parts materials		
Process flange screws	Electronics enclosure	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting	3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3

All versions include DVD with compact operating instructions in various EU languages.

Selection and Ordering data	Article No.
Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)	
SITRANS P DS III with PROFIBUS PA (PA)	7MF4534-
SITRANS P DS III with FOUNDATION Fieldbus (FF)	7MF4535-
Explosion protection	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)"[7]	D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[8]	P
- "Ex nA/ic (Zone 2)" [9]	E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[8] [10]	R
• FM + CSA intrinsic safe (is)[11]	F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX)+ Zone 1D/2D[9] [10] [11]	S
• With FM + CSA, Type of protection:	
- "Intrinsic safety and explosion-proof (is + xp)"[7] [11], max PN 360	NC
Electrical connection/cable entry	
• Screwed gland M20 x 1.5	B
• Screwed gland ½-14 NPT	C
• Device plugs M12 (stainless steel) [12] [13]	F
Display	
• Without (display hidden)	0
• Without visible display (display concealed, setting: bar)	1
• With visible display (setting: bar)	6
• With customer-specific display (setting as specified, Order code "Y21" required)	7

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

1) For oxygen application, add Order code E10.
2) Not in conjunction with max. measuring span 600 mbar (240.9 inH_2O)
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 inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
5) The diaphragm seal is to be specified with a separate order number and must be included wiht the transmitter order number, for example 7MF453.-..Y..-.... and 7MF4900-1....-.B
6) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
7) Without cable gland, with blanking plug.
8) With enclosed cable gland Ex ia and blanking plug.
9) Configurations with device plugs Han and M12 are only available in Ex ic.
10) Only in connection with IP66.
11) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
12) Only in connection with Ex approval A, B, E or F.
13) M12 delivered without cable socket

Selection and Ordering data	Order code	HART	PA	FF
Further designs Add "**-Z**" to Article No. and specify Order code.				
Pressure transmitter with mounting bracket (1x fixing angle, 2 x nut, 2 x U-washer or 1 x bracket, 2 x nut, 2 x U-washer) made of:				
• Steel	**A01**	✓	✓	✓
• Stainless steel 304	**A02**	✓	✓	✓
• Stainless steel 316L	**A03**	✓	✓	✓
O-rings for process flanges (instead of FPM (Viton))				
• PTFE (Teflon)	**A20**	✓	✓	✓
• FEP (with silicone core, approved for food)	**A21**	✓	✓	✓
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	**A22**	✓	✓	✓
• NBR (Buna N)	**A23**	✓	✓	✓
Device plugs[1]				
• Han 7D (metal)	**A30**	✓		
• Han 8D (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
• Han 8D (metal)	**A33**	✓		
Sealing screws (2 units) ¼-18 NPT, with valve in mat. of process flanges	**A40**	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))	**A50**	✓	✓	✓
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
• Cyrillic (russian)	**B16**	✓	✓	✓
English rating plate Pressure units in inH_2O and/or psi	**B21**	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	**C14**	✓	✓	✓
Inspection certificate (EN 10204-3.1) PMI test of parts in contact with medium	**C15**	✓	✓	✓
Functional safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C20**	✓		
Functional safety (PROFIsafe) Certificate and PROFIsafe protocol	**C21**[2]		✓	
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C23**	✓		
PED for Russia with initial calibration mark	**C99**	✓	✓	✓

Selection and Ordering data	Order code			
Setting of the upper saturation limit of the output signal to 22.0\ mA	**D05**	✓		
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	**D07**	✓	✓	✓
Degree of protection IP66/IP68 (only for M20 x 1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Nominal pressure rating PN 500 (MAWP 7250 psi) (Only for measuring cell 600 mbar ... 30 bar (240 inH_2O ... 435 psi), SIL- and Ex-options not possible))[3]	**D56**	✓		
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	**D59**	✓	✓	✓
Use in or on zone 1D/2D[4] (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-.B.. Ex ia)"and IP66)	**E01**	✓	✓	✓
Export approval Korea	**E11**	✓	✓	✓
CRN approval Canada (Canadian Registration Number)	**E22**[5]	✓	✓	✓
Dual seal	**E24**	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.B..)	**E25**[6]	✓	✓	✓
"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.D..)	**E26**[6]	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.P..)	**E28**[6]	✓	✓	
Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-.B..)	**E45**[6]	✓	✓	✓
Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-.D..)	**E46**[6]	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-.B..)	**E55**[6]	✓	✓	✓
Ex prot. "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-.D..)	**E56**[6]	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.E..)	**E57**[6]	✓	✓	✓
Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.R..)	**E58**[6]	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-.[B, D]..-Z + E11)	**E70**[6]	✓	✓	✓
Ex-protection Ex ia acc. to EAC Ex (Russia)	**E80**	✓	✓	✓
Ex-protection Ex d acc. to EAC Ex (Russia)	**E81**	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	**E82**	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	**E83**	✓	✓	✓

for differential pressure and flow

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Article No. and specify Order code.				
Two coats of lacquer on enclosure and cover (PU on epoxy)	**G10**	✓	✓	✓
Interchanging of process connection side	**H01**	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines	**H03**	✓	✓	✓
Transient protector 6 kV (lightning protection)	**J01**	✓	✓	✓
Chambered graphite gasket for process flange	**J02**	✓	✓	✓
EPDM O-rings for process flange with approval (WRC/WRAS)	**J05**	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)[7)]	**J08**	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)[7)]	**J09**	✓	✓	✓
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	**S10**	✓	✓	✓
• Lloyds Register (LR)	**S11**	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	**S12**	✓	✓	✓
• American Bureau of Shipping (ABS)	**S14**	✓	✓	✓
• Russian Maritime Register (RMR)	**S16**	✓	✓	✓
• Korean Register of Shipping (KR)	**S17**	✓	✓	✓

1) Device plug Han IP65
2) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H
3) Tested according to IEC 61010. Only for media of the group of fluids 2 in accordance with PED permissible. Not for use with dangerous media suitable.
4) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.
5) Cannot be ordered with remote seal.
6) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.
7) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

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

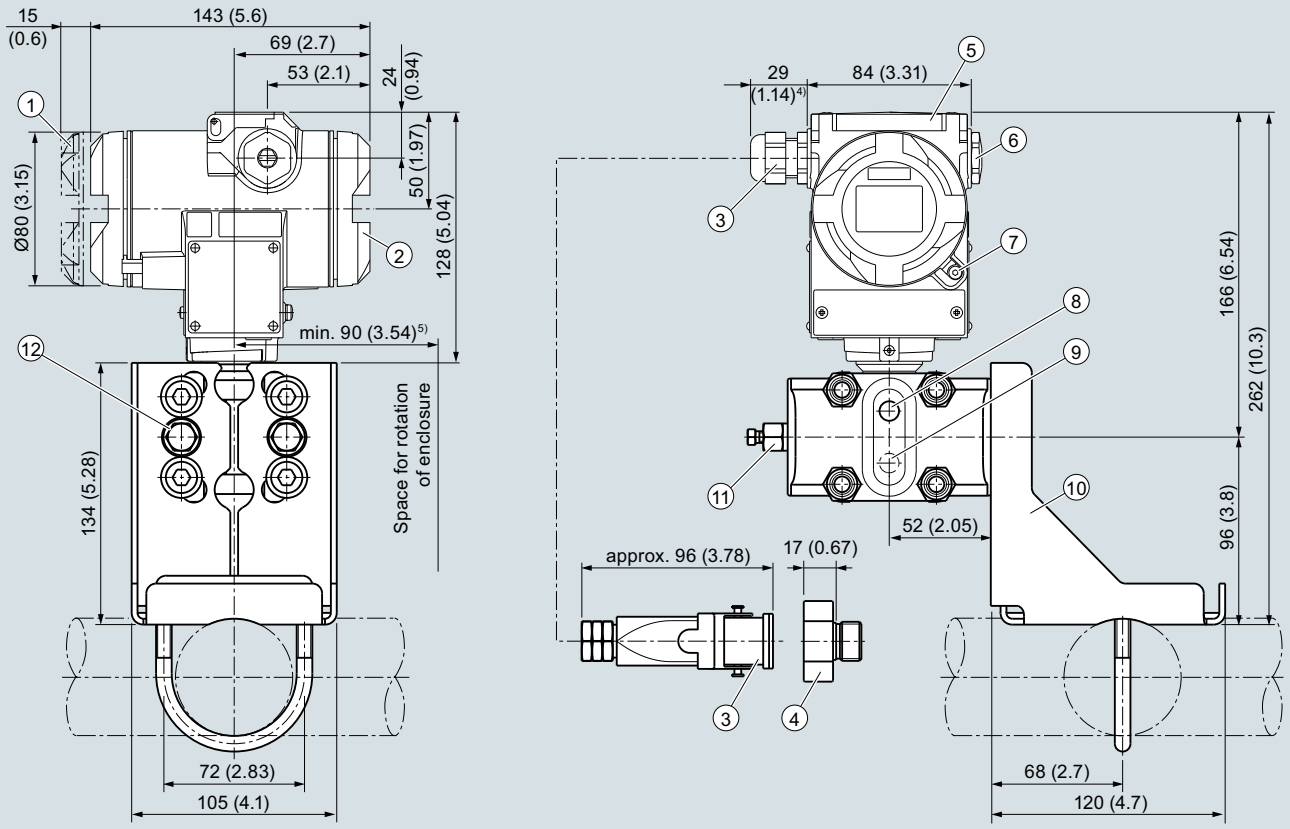
Factory mounting of valve manifolds, see accessories.

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

✓ = available

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

Dimensional drawings

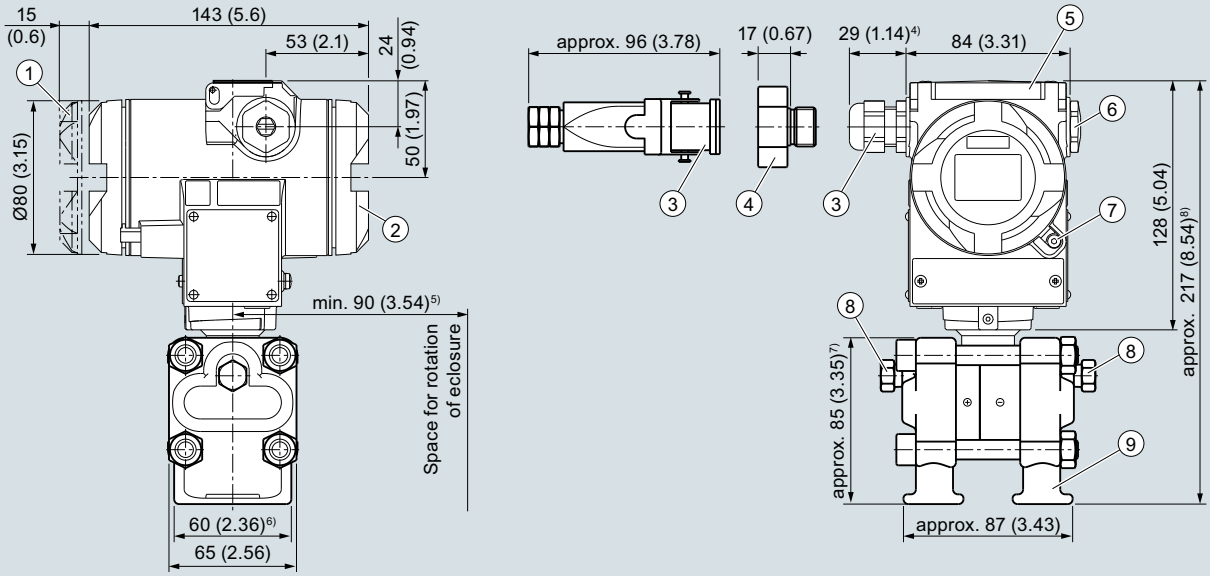


1. Electronics side, local display (longer overall length for cover with inspection window)[1]
2. Connection side[1]
3. Electrical connection:
   - Pg 13.5 screw gland (adapter)[2] [3]
   - M20 x 1,5 screw gland
   - ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] device plug
4. Harting adapter
5. Cover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

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

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

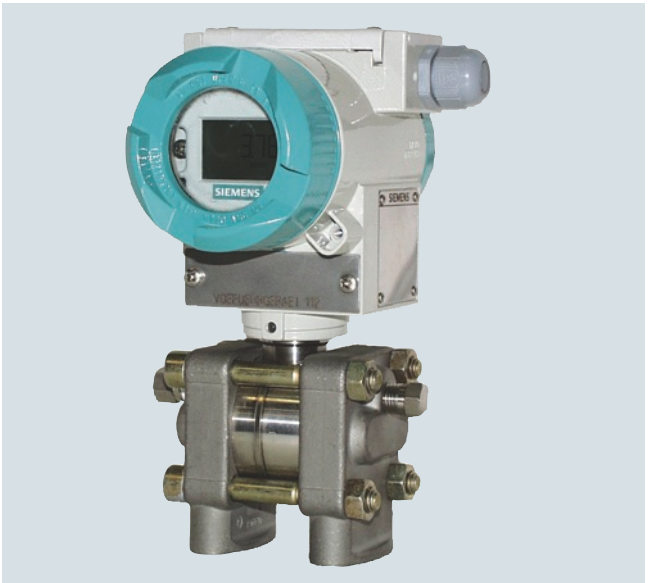
for differential pressure and flow



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

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

SITRANS 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			
Input			
Measured variable	Level		
Measuring span (infinitely adjustable) or nominal measuring range and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**	
	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)
	25 ... 250 mbar 2.5 ... 25 kPa 10 ... 100 inH_2O	250 mbar 25 kPa 100 inH_2O	See "Mounting flange"
	25 ... 600 mbar 2.5 ...60 kPa 10 ... 240 inH_2O	600 mbar 60 kPa 240 inH_2O	
	53 ... 1600 mbar 5.3 ...160 kPa 21 ... 640 inH_2O	1600 mbar 160 kPa 642 inH_2O	
	160 ... 5000 mbar 16 ...500 kPa 2.32 ... 72.5 psi	5000 mbar 500 kPa 72.5 psi	
Lower measuring limit			
• Measuring cell with silicone oil filling	-100 % of max. measuring span or 30 mbar a/3 kPa a/0.44 psi a depending on mounting flange		
• Measuring cell with inert filling liquid	-100 % of max. measuring span or 30 mbar a/3 kPa a/0.44 psi a depending on mounting flange		
Upper measuring limit	100 % of max. measuring span		
Lower range value	Between the measuring limits (fully adjustable)		
Output	**HART**		**PROFIBUS PA/FOUNDATION Fieldbus**
Output signal	4 ... 20 mA		Digital PROFIBUS PA and FOUNDATION Fieldbus signal
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-
Load			
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V		-
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)		-
Physical bus	-		IEC 61158-2
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.		
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)		

for level

SITRANS P DS III for level	
Measuring accuracy	Acc. to IEC 60770-1
Reference conditions	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Silicone oil filling • Room temperature 25 °C (77 °F)
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range
Error in measurement at limit setting incl. hysteresis and reproducibility	
• Linear characteristic	
- 250 mbar/25 kPa/3.6 psi	r ≤ 5 : ≤ 0.125 % 5 < r ≤ 10 : ≤ (0.007 · r + 0.09) %
- 600 mbar/60 kPa/8.7 psi	r ≤ 5 : ≤ 0.125 % 5 < r ≤ 25 : ≤ (0.007 · r + 0.09) %
- 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi	r ≤ 5 : ≤ 0.125 % 5 < r ≤ 30 : ≤ (0.007 · r + 0.09) %
Influence of ambient temperature (in percent per 28 °C (50 °F))	
• 250 mbar/25 kPa/3.6 psi	≤ (0.4 · r + 0.16) %
• 600 mbar/60 kPa/8.7 psi	≤ (0.24 · r + 0.16) %
• 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi	≤ (0.2 · r + 0.16) %
Influence of static pressure	
• on the lower range value	
- 250 mbar/25 kPa/3.6 psi	≤ (0.3 · r) % per nominal pressure
- 600 mbar/60 kPa/8.7 psi	≤ (0.15 · r) % per nominal pressure
- 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi	≤ (0.1 · r) % per nominal pressure
• on the measuring span	≤ (0.1 · r) % per nominal pressure
Long-term stability (temperature change ± 30 °C (± 54 °F))	≤ (0.25 · r)% in 5 years static pressure max. 70 bar/7 MPa/1015 psi
Effect of mounting position	Depending on filling liquid of mounting flange
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range
Operating conditions	
Degree of protection	
• according to EN 60529	IP66 (optional IP66/IP68)
• according to NEMA 250	Type 4X
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[1)] °C (-40 ... +212[1)] °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	
- Transmitter	-40 ... +85 °C (-40 ... +185 °F)
- -Display readable	-30 ... +85 °C (-22 ... +185 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
• Climatic class	
- Condensation	Relative humidity 0 ... 100 %, condensation permissible, suitable for use in the tropics
• Electromagnetic Compatibility	
- Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21

SITRANS P DS III for level		
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, W.-Nr. 1.4404/316L - coated with PFA - coated with PTFE - coated with ECTFE - gold plated • Monel 400, mat. no. 2.4360 • Hastelloy C276, mat. no 2.4619 • Hastelloy C4, mat. no. 2.4602 • Hastelloy C22, mat. no. 2.4602 • Tantalum • Titanium, mat. no. 3.7035 • Nickel 201 • Duplex 2205, mat. no. 1.4462	
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/DIN EN 61518	
Power supply U_H	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate supply voltage	-	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		
Certificates and approvals	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 13 ATEX 2007 X	
- Marking	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC	To circuits with values: U_H = 9 ... 32 V DC
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 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 Ex tb IIIC T120°C Db	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC; P_{max} = 1.2 W	To circuits with values: U_H = 9 ... 32 V DC; P_{max} = 1 W
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	U_m = 45 V	U_m = 32 V
- Connection (Ex ic)	To circuits with values: U_i = 45 V	FISCO supply unit ic: U_o = 17.5 V, I_o = 570 mA Linear barrier: U_o = 32 V, I_o = 132 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion protection acc. to FM	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) This value may be increased if the process connection is sufficiently insulated.

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

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

for level

Selection and Ordering data		Article No.
Pressure transmitter for level, SITRANS P DS III with HART ↗		7MF4633-
		▢▢Y▢▢-▢▢▢▢
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Measuring span (min. ... max.)		
25 ... 250 mbar	(10 ... 100 inH_2O)	D
25 ... 600 mbar	(10 ... 240 inH_2O)	E
53 ... 1600 mbar	(21 ... 642 inH_2O)	F
0.16 ... 5 bar	(64.3 ... 2000 inH_2O)	G
Process connection of low-pressure side		
Female thread ¼-18 NPT with flange connection		
• Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		2
• Mounting thread M10 to DIN 19213 (only for replacement requirement)		0
Non-wetted parts materials		
process flange screws	Electronics enclosure	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting[1]	3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar)		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
- "Explosion-proof (Ex d)"[2]		D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[3]		P
- "Ex nA/ic (Zone 2)" [4]		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"[3][5]		R
• FM + CSA intrinsic safe (is)[6]		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[3][5][6]		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)"[1][6]		NC
Electrical connection/cable entry		
• Screwed gland M20x1.5		B
• Screwed gland ½-14 NPT		C
• Device plug Han 7D (plastic enclosure) incl. mating connector[7]		D
• Device plugs M12 (stainless steel) [8] [9]		F
Display		
• Without display		0
• Without visible display (display concealed, setting: mA)		1
• With visible display (setting mA)		6
• With customer-specific display (setting as specified, Order code "Y21" or "Y22" required)		7

Ordering information

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

ordering example

Item line 1:	7MF4633-1EY20-1AA1-Z
B line:	Y01
C line:	Y01: 80 to 143 mbar (1.16 to 2.1 psi)
Item line 2:	7MF4912-3GE01

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

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

1) Not in conjunction with Electrical connection "device plug Han 7D".
2) Without cable gland, with blanking plug.
3) With enclosed cable gland Ex ia and blanking plug.
4) Configurations with device plugs Han and M12 are only available in Ex ic.
5) Only in connection with IP66.
6) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
7) Only in connection with Ex approval A, B or E.
8) M12 delivered without cable socket
9) Only in connection with Ex approval A, B, E or F.

Selection and Ordering data		Article No.
Pressure transmitters for level		
SITRANS P DS III with PROFIBUS PA (PA) ↗		7MF4634-
SITRANS P DS III with FOUNDATION Fieldbus (FF) ↗		7MF4635-
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		1 ■ Y ■■ - ■■■■
Nominal measuring range		
250 mbar	(100 inH_2O)	D
600 mbar	(240 inH_2O)	E
1600 mbar	(642 inH_2O)	F
5 bar	(2000 inH_2O)	G
Process connection of low-pressure side		
Female thread ¼-18 NPT with flange connection		
• Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		2
• Mounting thread M10 to DIN 19213 (only for replacement requirement)		0
Non-wetted parts materials		
process flange screws	Electronics enclosure	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting	3
Version		
• Standard version, German plate inscription, setting for pressure unit: bar)		1
• International version, English plate inscription, setting for pressure unit: bar		2
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None		A
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		B
- "Explosion-proof (Ex d)"[1]		D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[2]		P
- "Ex nA/ic (Zone 2)" [3]		E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[2][4]		R
• FM + CSA intrinsic safe (is)[5]		F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[2][4][5]		S
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)"[1][5]		N C
Electrical connection/cable entry		
• Screwed gland M20 x 1.5		B
• Screwed gland ½-14 NPT		C
• Device plugs M12 (stainless steel)[6] [7]		F
Display		
• Without display		0
• Without visible display (display concealed, setting: bar)		1
• With visible display (setting: bar)		6
• With customer-specific display (setting as specified, Order code "Y21" required)		7

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:
- Quick-start guide
- Sealing plug(s) or sealing screw(s) for the process flanges(s)

1) Without cable gland, with blanking plug.
2) With enclosed cable gland Ex ia and blanking plug.
3) Configurations with device plugs Han and M12 are only available in Ex ic.
4) Only in connection with IP66.
5) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
6) M12 delivered without cable socket
7) Only in connection with Ex approval A, B, E or F.

for level

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Article 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, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	**A22**	✓	✓	✓
• NBR (Buna N)	**A23**	✓	✓	✓
Device plugs[1]				
• Han 7D (metal)	**A30**	✓		
• Han 8D (instead of Han 7D)	**A31**	✓		
• Angled	**A32**	✓		
• Han 8D (metal)	**A33**	✓		
Sealing screw ¼-18 NPT, with vent valve in mat. of process flanges	**A40**	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))	**A50**	✓	✓	✓
Rating plate inscription (instead of German)				
• English	**B11**	✓	✓	✓
• French	**B12**	✓	✓	✓
• Spanish	**B13**	✓	✓	✓
• Italian	**B14**	✓	✓	✓
• Cyrillic (russian)	**B16**	✓	✓	✓
English rating plate Pressure units in in$H_2$0 and/or psi	**B21**	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1	**C12**	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	**C14**	✓	✓	✓
Inspection certificate (EN 10204-3.1) PMI test of parts in contact with medium	**C15**	✓	✓	✓
Functional safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C20**	✓		
Functional safety (PROFIsafe) Certificate and PROFIsafe protocol	**C21**[2]		✓	
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C23**	✓		
PED for Russia with initial calibration mark	**C99**	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA	**D05**	✓		
Degree of protection IP66/IP68 (only for M20x1.5 and ½-14 NPT)	**D12**	✓	✓	✓
Supplied with oval flange (1 item), PTFE packing and screws in thread of process flange	**D37**	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	**D59**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Article No. and specify Order code.				
Use on zone 1D / 2D[3] (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-.B.. Ex ia)"and IP66)	**E01**	✓	✓	✓
Overfilling safety device for flammable and non-flammable liquids (max. PN 32 (MAWP 464 psi), basic device with type of protection "Intrinsic safety (Ex ia)", to WHG and VbF, not together with measuring cell filling "inert liquid")	**E08**	✓		
Export approval Korea	**E11**	✓	✓	✓
Dual seal	**E24**	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.B..)	**E25**[4]	✓	✓	✓
"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.D..)	**E26**[4]	✓	✓	✓
Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-.P..)	**E28**[4]	✓	✓	
Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-.B..)	**E45**[4]	✓	✓	✓
Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-.D..)	**E46**[4]	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-.B..)	**E55**[4]	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-.D..)	**E56**[4]	✓	✓	✓
Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.E..)	**E57**[4]	✓	✓	✓
Ex protection „Ex ia", „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-.R..)	**E58**[4]	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-.[B, D]..-Z + E11)	**E70**[4]	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)	**E80**	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)	**E81**	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	**E82**	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	**E83**	✓	✓	✓
Two coats of lacquer on enclosure and cover (PU on epoxy)	**G10**	✓	✓	✓
Replacement of process connection side	**H01**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Article No. and specify Order code.				
Transient protector 6 kV (lightning protection)	**J01**	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)[5]	**J08**	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)[5]	**J09**	✓	✓	✓

1) Device plug Han IP65
2) Profisafe transmitters can only be operated with the S7 F Systems V6.1 configuration software in combination with S7-400H
3) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.
4) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.
5) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

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

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

✓ = available

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

Selection and Ordering data		Article No.	Order code
Mounting flange ↗		7MF4912	
Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series		3	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Connection to EN 1092-1			
Nominal diameter	**Nominal pressure**		
DN 25	PN 10/16/25/40	Z	J0A
	PN 63/100/160	Z	J0B
DN 40	PN 10/16/25/40	Z	J0C
	PN 63/100	Z	J0D
	PN 160	Z	J0E
DN 50	PN 10/16/25/40	A	
	PN 100	B	
DN 80	PN 10/16/25/40	D	
DN 100	PN 10/16	G	
	PN 25/40	H	
Connection to ASME B16.5			
Nominal diameter	**Nominal pressure**		
1 inch	class 150	Z	J6A
	class 300	Z	J6B
	class 400/600	Z	J6C
	class 900/1500	Z	J6D
1½ inch	class 150	Z	J6E
	class 300	Z	J6F
	class 400/600	Z	J6G
	class 900/1500	Z	J6H
2 inch	class 150	L	
	class 300	M	
	class 400/600	N	
	class 900/1500	P	
3 inch	class 150	Q	
	class 300	R	
4 inch	class 150	T	
	class 300	U	
Flange acc. to JIS			
Nominal diameter	**Nominal pressure**		
JIS DN 50	10 K 316L	Z	J7A
	20 K 316L	Z	J7B
JIS DN 80	10 K 316L	Z	J7C
	20 K 316L	Z	J7D
Other version, add Order code and plain text: Nominal diameter: ...; Nominal press.: ...		Z	J1Y
Wetted parts materials			
• Stainless steel 316L		A	
- Coated with PFA		D	
- Coated with PTFE		E0	
- Coated with ECTFE[1)]		F	
• Monel 400, mat. no. 2.4360		G	
• Hastelloy C276, mat. no. 2.4819		J	
• Hastelloy C4, mat. no. 2.4602		U	
• Hastelloy C22, mat. no. 2.4602		V0	
• Tantalum		K	
• Titanium, mat. no. 3.7035 (max. 150 °C (302 °F))		L0	
• Nickel 201 (max. 260 °C (500 °F))		M0	
• Duplex 2205, mat. no. 1.4462		Q	
• Duplex 2205, mat. no. 1.4462, incl. main body		R	
• Stainless steel 316L, gold plated, thickness approx. 25 µm		S0	
Tube length			
• without tube		0	
Other version: add Order code and plain text: material of parts in contact with medium: ....., tubus length:		Z8	K1Y

Selection and Ordering data		Article No.	Order code
Mounting flange		7MF4912	
Directly mounted on the SITRANS P pressure transmitter (converter part) for level, for DS III series		3	
Customer-specific tubus length			
Specify customer-specific length with Y44, see Order Code			
• Wetted parts materials: Stainless steel without foil			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	A1	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	A2	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	A3	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	A4	
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	A5	
• Wetted parts materials: Stainless steel coated with ECTFE			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	F1	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	F2	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	F3	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	F4	
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	F5	
• Wetted parts materials: Stainless steel coated with PFA			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	D1	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	D2	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	D3	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	D4	
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	D5	
• Wetted parts materials: Monel 400			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	G1	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	G2	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	G3	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	G4	
• Wetted parts materials: Hastelloy C276			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	J1	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	J2	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	J3	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	J4	
• Wetted parts materials: Tantalum			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	K1	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	K2	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	K3	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	K4	
Filling liquid			
• Silicone oil M5		1	
• Silicone oil M50		2	
• High-temperature oil		3	
• Halocarbon oil (for O_2-measurement)[2)]		4	
• Food oil (FDA-listed)		7	
Other version, add Order code and plain text: filling liquid: ...		9	M1Y

[1)] For vacuum on request

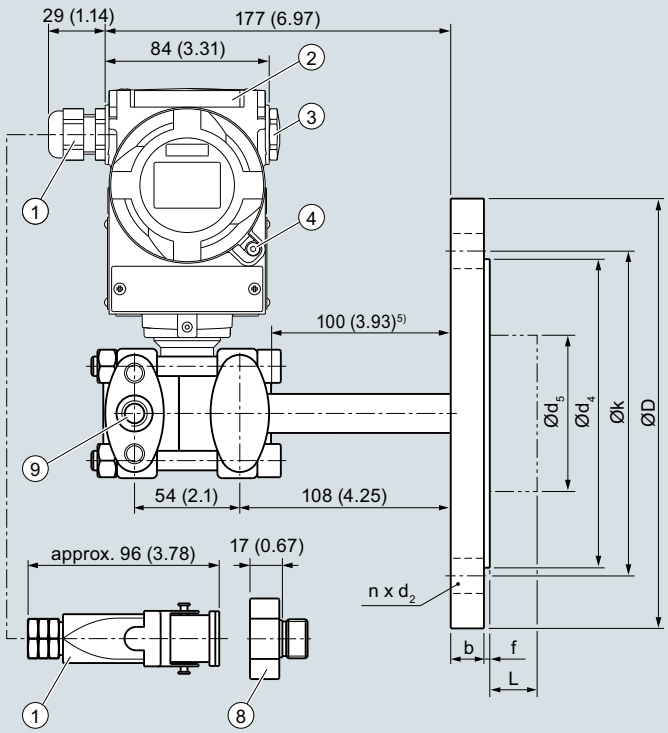
[2)] Oil and grease-free cleaning according to DIN 25410, level 2, and packaging included in scope of delivery. Refer to "Further designs" C10 and E10.

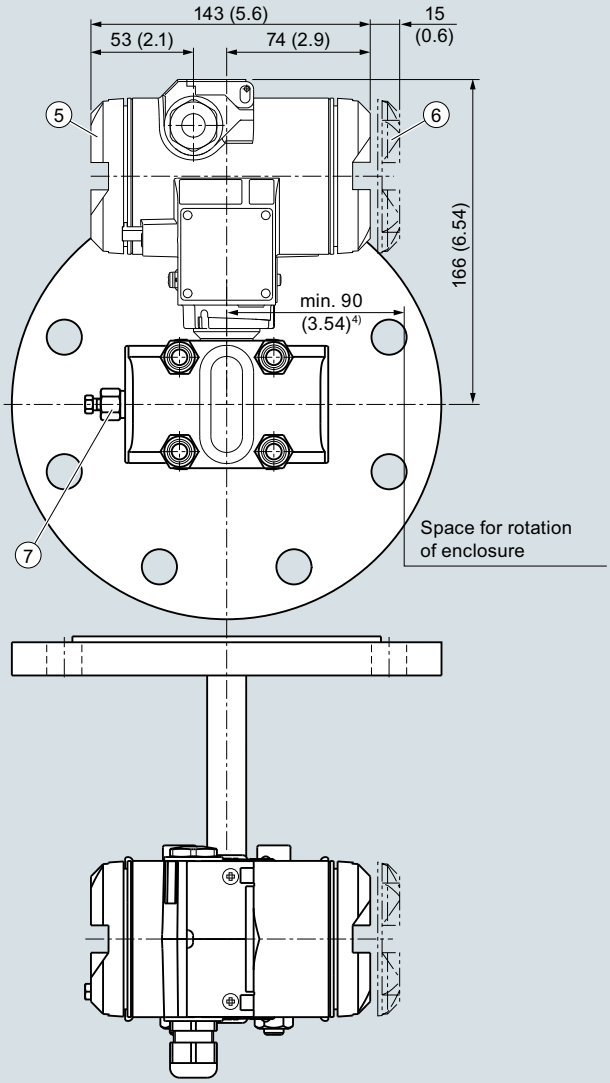
Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Article No. and specify Order code.				
Customer-specific tubus length Select range, enter desired length in plain text (No entry = standard length)	**Y44**	✓	✓	✓
Spark arrester For mounting on zone 0 (incl. documentation)	**A01**	✓	✓	✓
Remote seal nameplate attached out of stainless steel, contains Article No. and order number of the remote seal supplier	**B20**	✓	✓	✓
Oil- and grease-free cleaned version Oil- and grease-free cleaned and packed version, not for oxygen application, only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2	**C10**	✓	✓	✓
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1	**C12**	✓	✓	✓
2.2 Certificate of FDA approval of fill oil Only in conjunction with filling liquid "Food oil" (FDA listed)"	**C17**	✓	✓	✓
"Functional safety (SIL2)" certificate to IEC 61508 (only for conjunction with the Order code "C20" in the case of SITRANS P DS III transmitter)	**C20**	✓	✓	
"Functional safety (SIL2/3)" certificate to IEC 61508 (only for conjunction with the Order code "C23" in the case of SITRANS P DS III transmitter)	**C23**	✓	✓	
Certification acc. to NACE MR-0175 Includes inspection certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	**D07**	✓	✓	✓
Certification acc. to NACE MR-0103 Includes inspection certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	**D08**	✓	✓	✓
Oil- and grease-free cleaned version Oil- and grease-free cleaned and packed version, only for oxygen application, only inert fill fluid may be used. Max. temperature: 60 °C (140 °F), max. pressure 50 bar (725 psi), only in connection with halocarbon oil, certified by certificate acc. to EN 10204-2.2	**E10**	✓	✓	✓
Epoxy painting Not possible with negative pressure service Color: transparent, coverage: front and rear of the remote seal, capillary(ies) or connecting tube, process connection of the transmitter. With transmitters 7MF40.. and 7MF42.., only possible with process connection G½B according to EN 837-1.	**E15**	✓	✓	✓

Selection and Ordering data	Order code	HART	PA	FF
Further designs				
Add "**-Z**" to Article No. and specify Order code.				
One sided-mounting, sealing surface below	**H20**			
Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm) previously DIN 2501, form E	**J11**	✓	✓	✓
Sealing surface groove, EN 1092-1, form D instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)	**J14**	✓	✓	✓
Sealing surface with spring according to EN 1092-1, form F, (previously DIN 2512, form F) in stainless steel 316L				
DN 25	**J30**	✓	✓	✓
DN 40	**J31**	✓	✓	✓
DN 50	**J32**	✓	✓	✓
DN 80	**J33**	✓	✓	✓
DN 100	**J34**	✓	✓	✓
DN 125	**J35**	✓	✓	✓
Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L				
DN 25	**J40**	✓	✓	✓
DN 40	**J41**	✓	✓	✓
DN 50	**J42**	✓	✓	✓
DN 80	**J43**	✓	✓	✓
DN 100	**J44**	✓	✓	✓
DN 125	**J45**	✓	✓	✓
Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L				
DN 25	**J50**	✓	✓	✓
DN 40	**J51**	✓	✓	✓
DN 50	**J52**	✓	✓	✓
DN 80	**J53**	✓	✓	✓
DN 100	**J54**	✓	✓	✓
DN 125	**J55**	✓	✓	✓
Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA instead of sealing surface B2 or RFSF (only for wetted parts made of Hastelloy C276 (2.4819), tantalum and Duplex 2205 (1.4462) and for nominal sizes 2", 3", DN 50 and DN 80)	**J12**	✓	✓	✓
Sealing surface RJF (groove, previously RTJ) ASME B16.5 instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)	**J24**	✓	✓	✓
Elongated pipe, 150 mm instead of 100 mm, max. medium temperature 250 °C, observe the maximum permissible media temperature of the filling liquid.	**R15**	✓	✓	✓
Elongated pipe, 200 mm instead of 100 mm, max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	**R20**	✓	✓	✓
Vacuum resistant design				
Design with negative pressure service for level transmitter	**V04**	✓	✓	✓
Design with extended negative pressure service for level transmitter Note: suffix "Y01" required with pressure transmitter	**V54**	✓	✓	✓

✓ = available

Dimensional drawings

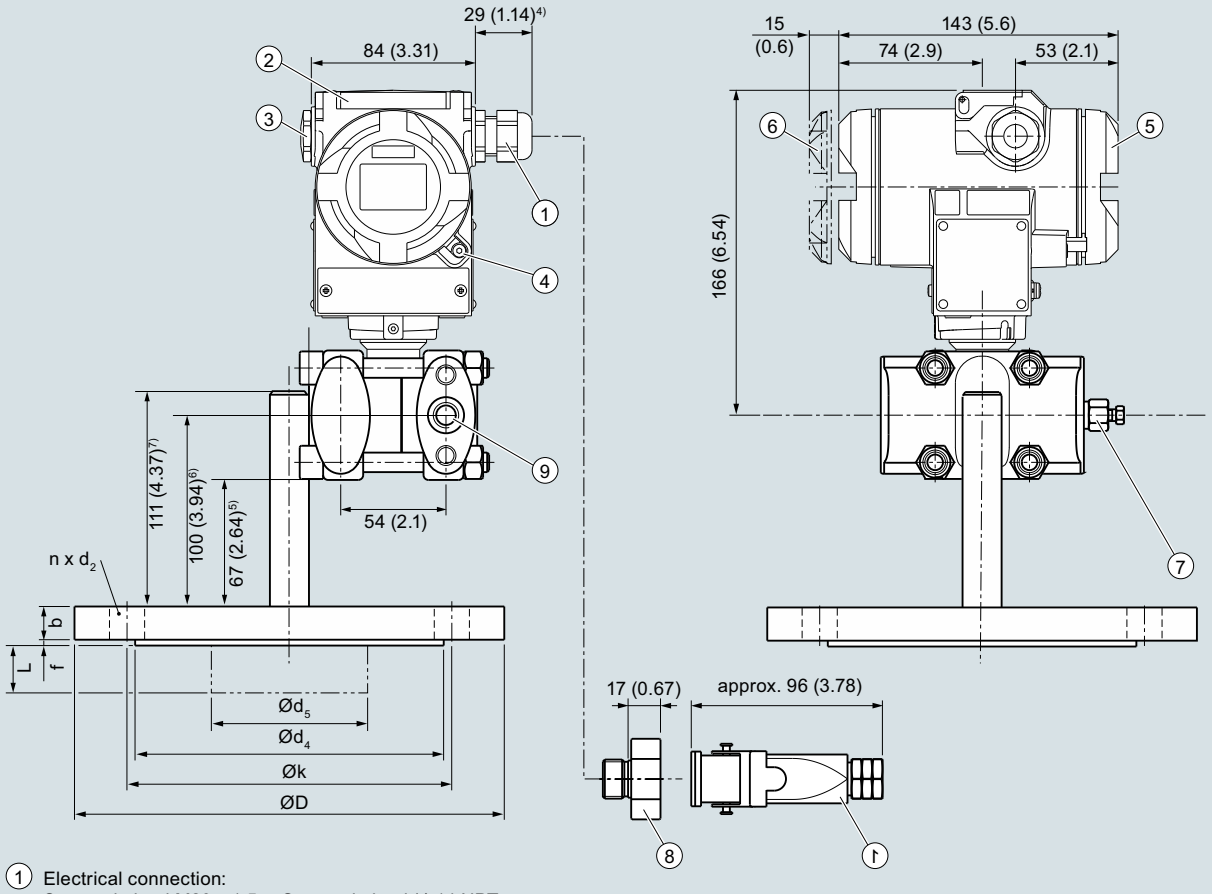




1. Electrical connection:
   Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or
   Han 7D/8D device plug[2) 3)]
2. Protective cover over keys
3. Blanking plug
4. Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure", not shown in the drawing)
5. Terminal side[1)]
6. 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) 150 (5.9) with Order Code R15, 200 (7.87) with Order Code R20

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



1. Electrical connection:
   Screwed gland M20 x 1,5 or Screwed gland ½-14 NPT or
   Han 7D/8D device plug[2) 3)]
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) For Pg 13,5 with adapter approx. 45 mm (1.77 inch)
5) 117 (4.61) with Order Code R15, 167 (6.57) with Order Code R20
6) 150 (5.19) with Order Code R15, 200 (7.87) with Order Code R20
7) 161 (6.34) with Order Code R15, 211 (8.31) with Order Code R20

SITRANS P DS III with HART pressure transmitters for level, including mounting flange, one sided-mounting, sealing surface below (order code H20), dimensions in mm (inch)

for level

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	mm
DN 50	PN 10/16/ 25/40	20	165	90	18	102	48.3	45[1]	2	125	4	0, 50, 100, 150 or 200
	PN 100	28	195	90	26	102	48.3	45[1]	2	145	8	
DN 80	PN 10/16/ 25/40	24	200	90	18	138	76	72[2]	2	160	8	
	PN 100	32	230	90	26	138	76	72[2]	2	180	8	
DN 100	PN 10/16	20	220	115	18	158	94	89	2	180	8	
	PN 25/40	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	150	0.77 (19.5)	5.91 (150)	0.79 (20)	3.62 (92)	1.9 (48.3)	1.77[1] (45)	0.08 (2)	4.74 (120.5)	4	0, 2, 3.94, 5.94 or 7.87 (0, 50, 100, 150 or 200)
	300	0.89 (22.7)	6.5 (165)	0.79 (20)	3.62 (92)	1.9 (48.3)	1.77[1] (45)	0.08 (2)	5 (127)	8	
	400/600	1.28 (32.4)	6.5 (165)	0.79 (20)	3.62 (92)	1.9 (48.3)	1.77[1] (45)	0.28 (7)	5 (127)	8	
	900/1500	1.78 (45.1)	8.46 (215)	1.02 (26)	5 (127)	1.9 (48.3)	1.77[1] (45)	0.28 (7)	6.5 (165)	8	
3 inch	150	0.96 (24.3)	7.48 (190)	0.79 (20)	5 (127)	3 (76)	2.83[2] (72)	0.08 (2)	6 (152.5)	4	
	300	1.14 (29)	8.27 (210)	0.87 (22)	5 (127)	3 (76)	2.83[2] (72)	0.08 (2)	6.63 (168.5)	8	
	600	1.53 (38.8)	8.27 (210)	0.87 (22)	5 (127)	3 (76)	2.83[2] (72)	0.28 (7)	6.63 (168.5)	8	
4 inch	150	0.96 (24.3)	9.06 (230)	0.79 (20)	6.22 (158)	3.69 (94)	3.5 (89)	0.08 (2)	7.5 (190.5)	8	
	300	1.27 (32.2)	10.04 (255)	0.87 (22)	6.22 (158)	3.69 (94)	3.5 (89)	0.08 (2)	7.87 (200)	8	
	400	1.65 (42)	10.04 (255)	1.02 (26)	6.22 (158)	3.69 (94)	3.5 (89)	0.28 (7)	7.87 (200)	8	

d: Internal diameter of gasket to DIN 2690
d_M: Effective diaphragm diameter

[1] 59 mm = 2.32 inch with tube length L=0.

[2] 89 mm = 3½ inch with tube length L=0.

Selection and Ordering data		Article No.
Replacement measuring cell for pressure for SITRANS P DS III		7MF4990-
		■■■■0-0DB0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	Normal	1
Inert liquid	grease-free to cleanliness level 2	3
Measured span (min. ... max.)		
8.3 ... 250 mbar	(0.12 ... 3.6 psi)	A
0.01 ... 1 bar	(0.15 ... 14.5 psi)	B
0.04 ... 4 bar	(0.6 ... 58 psi)	C
0.16 ... 16 bar	(2.32 ... 232 psi)	D
0.63 ... 63 bar	(9.14 ... 914 psi)	E
1.6 ... 160 bar	(23.2 ... 2 320 psi)	F
4.0 ... 400 bar	(58.0 ... 5 802 psi)	G
7.0 ... 700 bar	(102.0 ... 10 153 psi)	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. measuring span 160 bar (2320 psi)		
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518		2
- Mounting thread M10 to DIN 19213		3
Further designs		Order code
Please add "**-Z**" to Article No. and specify Order code.		
Inspection certificate to EN 10204-3.1		**C12**

Selection and Ordering data		Article No.
Replacement measuring cell for absolute pressure for SITRANS P DS III (from the pressure series)		7MF4992-
		■■■■0-0DB0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	Normal	1
Inert liquid	grease-free to cleanliness level 2	3
Measured span (min. ... max.)		
8.3 ... 250 mbar a	(0.12 ... 3.63 psi a)	D
43 ... 1300 mbar a	(0.62 ... 18.86 psi a)	F
0.16 ... 5 bar a	(2.32 ... 72.5 psi a)	G
1 ... 30 bar a	(14.5 ... 435 psi a)	H
Wetted parts materials		
Seal diaphragm	Process connection	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Process connection		
• Connection shank G½B to EN 837-1		0
• Female thread ½-14 NPT		1
• Oval flange made of stainless steel, max. measuring span 160 bar (2320 psi)		
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518		2
- Mounting thread M10 to DIN 19213		3
Further designs		Order code
Please add "**-Z**" to Article No. and specify Order code.		
Inspection certificate to EN 10204-3.1		**C12**

Accessories/Spare Parts

Selection and Ordering data	Article No.
Replacement measuring cell for absolute pressure (from the differential pressure series) for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus series	7MF4993 - ■■■■■ - 0DC0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Measuring cell filling / **Measuring cell cleaning**	
Silicone oil / Normal	1
Inert liquid / grease-free to cleanliness level 2	3
Measured span (min. ... max.)	
8.3 ... 250 mbar a (0.12 ... 3.63 psi a)	D
43 ... 1300 mbar a (0.62 ... 18.86 psi a)	F
0.16 ... 5 bar a (2.32 ... 72.5 psi a)	G
1 ... 30 bar a (14.5 ... 435 psi a)	H
5.3 ... 100 bar a (76.9 ... 1450 psi a)	K E
Wetted parts materials	
Seal diaphragm / Parts of measuring cell	
Stainless steel / Stainless steel	A
Hastelloy / Stainless steel	B
Hastelloy / Hastelloy	C
Tantalum / Tantalum	E
Monel / Monel	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/DIN EN 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/DIN EN 61518	6
Non-wetted parts materials	
• Stainless steel process flange screws	2
Further designs Please add "**-Z**" to Article No. and specify Order code.	Order code
O-rings for process flanges (instead of FPM (Viton))	
• PTFE (Teflon)	**A20**
• FEP (with silicone core, approved for food)	**A21**
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	**A22**
• NBR (Buna N)	**A23**
Inspection certificate to EN 10204-3.1	**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 measuring span 5.3 ... 100 bar (76.9 ... 1450 psi)

Selection and Ordering data	Article No.
Replacement measuring cell for differential pressure and PN 32/160 (MAWP 464/2320 psi) for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus series	7MF4994 - ■■■■■ - 0DC0
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Measuring cell filling / **Measuring cell cleaning**	
Silicone oil / Normal	1
Inert liquid / grease-free to cleanliness level 2	3
Measured span (min. ... max.)	
PN 32 (MAWP 464 psi)	
1 ... 20 mbar[1] (0.4 ... 8 inH_2O)	B
PN 160 (MAWP 2320 psi)	
1 ... 60 mbar (0.4 ... 24 inH_2O)	C
2.5 ... 250 mbar (1 ... 100 inH_2O)	D
6 ... 600 mbar (2.4 ... 240 inH_2O)	E
16 ... 1600 mbar (6.4 ... 642 inH_2O)	F
50 ... 5000 mbar (20 ... 2000 inH_2O)	G
0.3 ... 30 bar (4.35 ... 435 psi)	H
Wetted parts materials (stainless steel process flanges)	
Seal diaphragm / Parts of measuring cell	
Stainless steel / Stainless steel	A
Hastelloy / Stainless steel	B
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/DIN EN 61518	2
• Vent on side of process flange	
- Mounting thread M10 to DIN 19213	4
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518	6
Non-wetted parts materials	
Stainless steel process flange screws	2
Further designs Please add "**-Z**" to Article No. and specify Order code.	Order code
O-rings for process flanges (instead of FPM (Viton))	
• PTFE (Teflon)	**A20**
• FEP (with silicone core, approved for food)	**A21**
• FFPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	**A22**
• NBR (Buna N)	**A23**
Inspection certificate to EN 10204-3.1	**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. measuring span 250, 1600, 5000 and 30000 mbar (100 inH_2O, 642 inH_2O, 2000 inH_2O and 435 psi).

Selection and Ordering data		Article No.
Replacement measuring cell for differential pressure and PN 420 (MAWP 6092 psi) for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus series ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		**7MF4995-** ■■■■■ **-0DC0**
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	Normal	**1**
Measured span (min. ... max.)		
2.5 ... 250 mbar	(1 ... 100 inH_2O)	**D**
6 ... 600 mbar	(2.4 ... 240 inH_2O)	**E**
16 ... 1600 mbar	(6.4 ... 642 inH_2O)	**F**
50 ... 5000 mbar	(20 ... 2000 inH_2O)	**G**
0.3 ... 30 bar	(4.35 ... 435 psi)	**H**
Wetted parts materials (stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	**A**
Hastelloy	Stainless steel	**B**
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/DIN EN 61518		**3**
• Vent on side of process flange		
- Mounting thread M12 to DIN 19213		**5**
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		**7**
Non-wetted parts materials		
• Stainless steel process flange screws		**2**
Further designs		Order code
Please add "**-Z**" to Article 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, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))		**A22**
• NBR (Buna N)		**A23**
Inspection certificate to EN 10204-3.1		**C12**
Stainless steel process flanges for vertical differential pressure lines		**H03**
without process flanges		**K00**

[1)] Not together with max. measuring span 600 mbar (240 inH_2O)

Accessories/Spare Parts

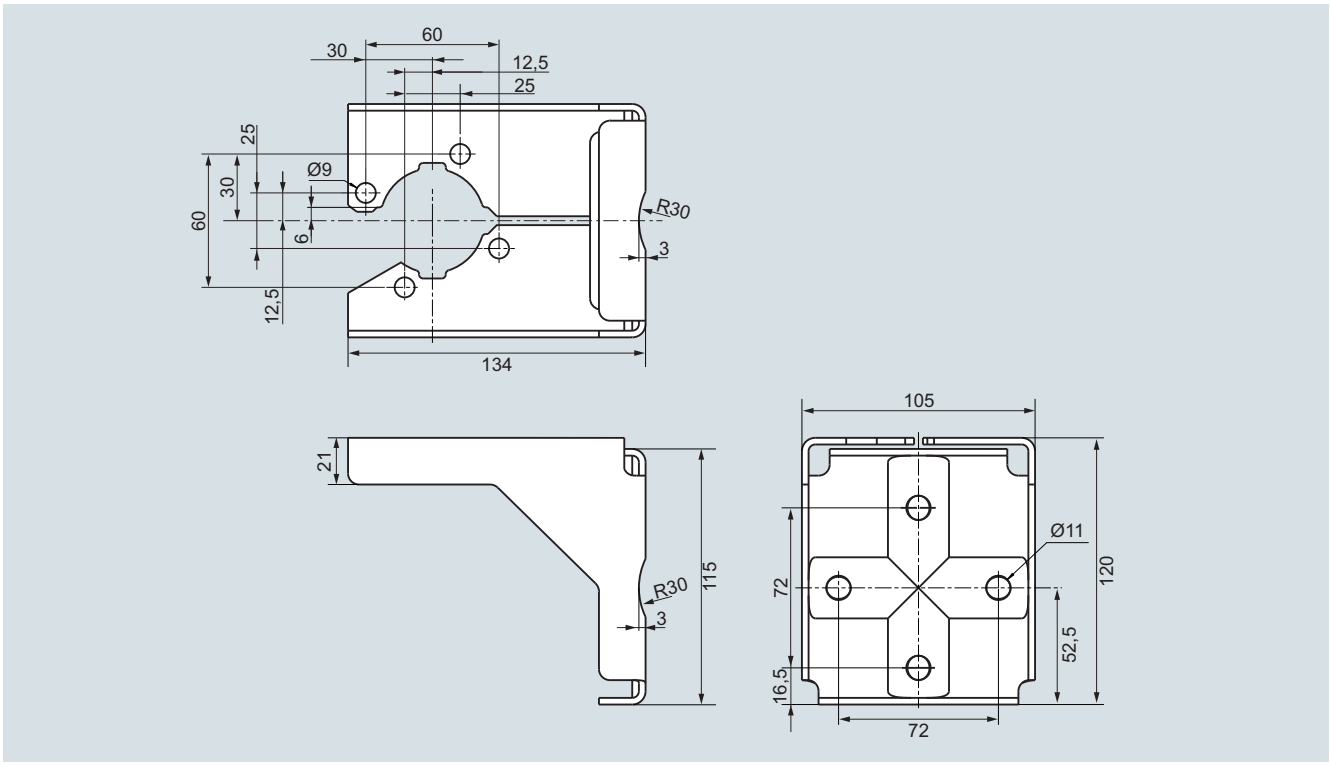
Selection and Ordering data	Article No.
Spare parts/Accessories	
Mounting bracket and fastening parts for pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF403.-.....-..C.) For absolute pressure transmitters SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus (7MF423.-.....-..C.)	
• made of steel	**7MF4997-1AB**
• made of stainless steel 304/1.4301	**7MF4997-1AH**
• made of stainless steel 316L/1.4404	**7MF4997-1AP**
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 304/1.4301	**7MF4997-1AJ**
• made of stainless steel 316L/1.4404	**7MF4997-1AQ**
Mounting and fastening brackets For differential pressure transmitters with flange thread M10 SITRANS 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 304/1.4301	**7MF4997-1AK**
• made of stainless steel 316L/1.4404	**7MF4997-1AR**
Mounting and fastening brackets For differential pressure transmitters with flange thread M12 SITRANS 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 304/1.4301	**7MF4997-1AL**
• made of stainless steel 316L/1.4404	**7MF4997-1AS**
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 304/1.4301	**7MF4997-1AM**
• made of stainless steel 316L/1.4404	**7MF4997-1AT**
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. Compatible for Ex and non-Ex transmitters	
• without window	**7MF4997-1BB**
• with window	**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. Compatible for Ex and non-Ex transmitters	
• without window	**7MF4997-1BC**
• with window	**7MF4997-1BF**

Selection and Ordering data	Article 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, Y16 and Y99 (see "Pressure transmitters")	**7MF4997-1CB-Z** **Y..: .....**
Mounting screws For measuring point label, grounding and connection terminals or for display (50 units)	**7MF4997-1CD**
Sealing screws (1 set = 2 units) for process flange	
• made of stainless steel	**7MF4997-1CG**
• made of Hastelloy	**7MF4997-1CH**
Sealing screws with vent valve Complete (1 set = 2 units)	
• made of stainless steel	**7MF4997-1CP**
• made of Hastelloy	**7MF4997-1CQ**
Application 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)	**7MF4997-2DA**
• PTFE (Teflon)	**7MF4997-2DB**
• FEP (with silicone core, approved for food)	**7MF4997-2DC**
• FFPM (Kalrez)	**7MF4997-2DD**
• NBR (Buna N)	**7MF4997-2DE**
Sealing ring for process connection	**see "Fittings"**
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"	**7MF4997-2HC**
• Gasket made of Viton for PMC Style Minibolt: front-flush 1"	**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 (FDA compliant)	**7MF4997-2HG**
Seals for flange connection with front-flush diaphragm M;aterial FKM (Viton); temperature range: -20 ... +200 °C (-4 ... +392 °F), 10 units	
• DN 25, PN 40 (M11)	**7MF4997-2HH**
• 1", class 150 (M40)	**7MF4997-2HK**

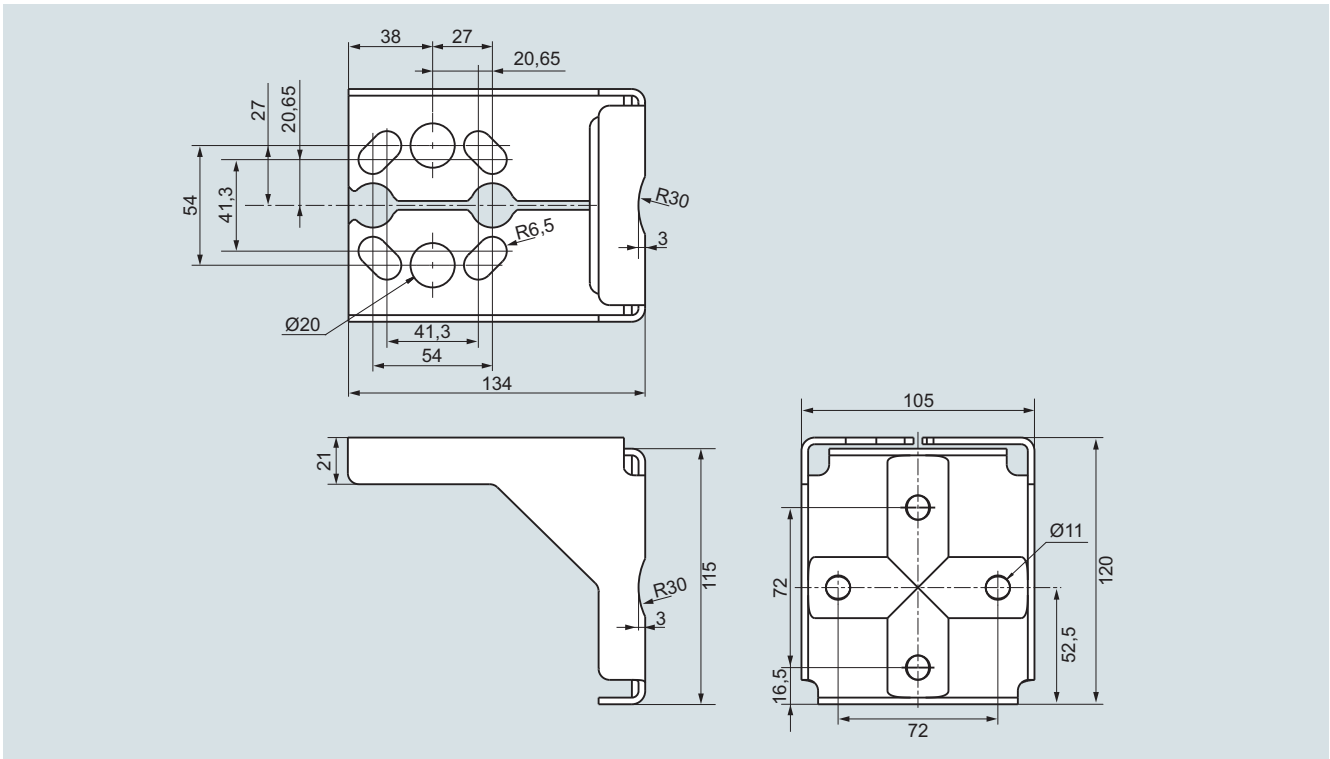
Selection and Ordering data	Article No.
Documentation	
The entire documentation is available for download free-of-charge in various languages at: http://www.siemens.com/processinstrumentation/documentation	
Compact operating instructions SITRANS P DS III/P410	
• English, German, Spanish, French, Italian,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

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

Dimensional drawings



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

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:

- 7MF9011-4EA and 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 7MF9011-4EA valve manifolds are sealed with PTFE gaskets between the transmitter and the valve manifold as standard. Soft iron, stainless steel and copper gaskets are also available for sealing purposes if preferred.

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 gaskets between the transmitter and the valve manifold.

The complete unit is checked for leaks under pressure after assembly (air pressure 6 bar (87 psi)) and certified with a factory certificate according to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the corresponding 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 inspection certificate 3.1 according to EN 10204 after choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitter and for the valve manifold.

Selection and Ordering data

7MF9411-5AA
valve manifold for relative and absolute pressure transmitters

Add „**-Z**" to the Article No. of the transmitter and add order codes.	Order code
SITRANS P DSIII 7MF403.-...2.-..., 7MF423.-...2.-... , 7MF403.-...3.-..., 7MF423.-...3.-... , 7MF403.-...4.-..., 7MF423.-...4.-... With process connection oval flange with PTFE gasket and **steel** mounting screws. Delivery including high-presure test certified by factory certificate according to EN 10204-2.2	**T05**
Additional versions:	
Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)	**A02**
Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	**C12**
With manufacturer declaration according to NACE, MR-0175	**D07**

7MF9411-5AA
valve manifold for relative and absolute pressure transmitters

Add „**-Z**" to the Article No. of the transmitter and add order codes.	Order code
SITRANS P DSIII 7MF403.-...2.-..., 7MF423.-...2.-... , 7MF403.-...3.-..., 7MF423.-...3.-... , 7MF403.-...4.-..., 7MF423.-...4.-... With process connection oval flange with PTFE gasket and **stainless steel** mounting screws. Delivery including high-presure test certified by factory certificate according to EN 10204-2.2	**T06**
Additional versions:	
Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)	**A02**
Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	**C12**
With manufacturer declaration according to NACE, MR-0175	**D07**

Factory-mounting of valve manifolds on transmitters

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

Add **-Z** to the Article 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 factory certificate according to EN 10204-2.2	**T03**
Further designs: Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)	**A02**
Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	**C12**
With manufacturer declaration according to NACE, MR-0175	**D07**

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

Add **-Z** to the Article 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 • Stainless steel, Mat. No. 14571 • copper Delivery incl. high-pressure test certified by factory certificate according to EN 10204-2.2	**A70** **A71** **A72**
Further designs: Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)	**A02**
Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	**C12**
With manufacturer declaration according to NACE, MR-0175	**D07**

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

Add **-Z** to the Article 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 • made of stainless steel Delivery incl. high-pressure test certified by factory certificate according to EN 10204-2.2	 **U01** **U02**
Further designs: Delivery includes mounting bracket and mounting clips made of • Steel • Stainless steel (instead of the mounting bracket supplied with the transmitter)	 **A01** **A02**
Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	**C12**
With manufacturer declaration according to NACE, MR-0175	**D07**

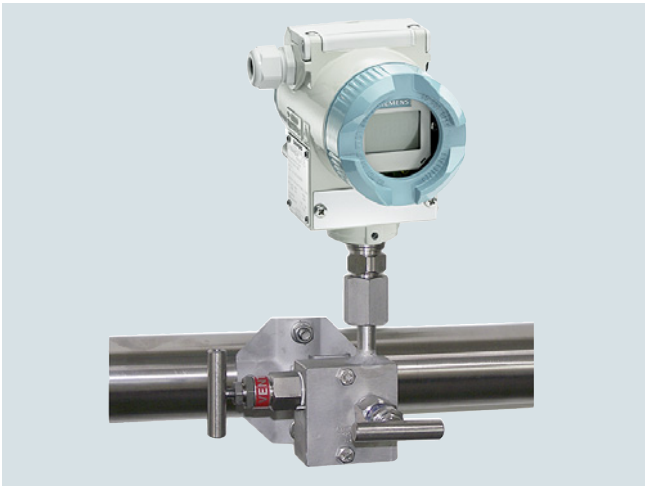
7MF9411-5CA
valve manifold on differential pressure transmitters

Add **-Z** to the Article 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 • Stainless steel Delivery incl. high-pressure test certified by factory certificate according to EN 10204-2.2	 **U03** **U04**
Further designs: Delivery includes mounting bracket and mounting clips made of • Steel • Stainless steel (instead of the mounting bracket supplied with the transmitter)	 **A01** **A02**
Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	**C12**
With manufacturer declaration according to NACE, MR-0175	**D07**

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

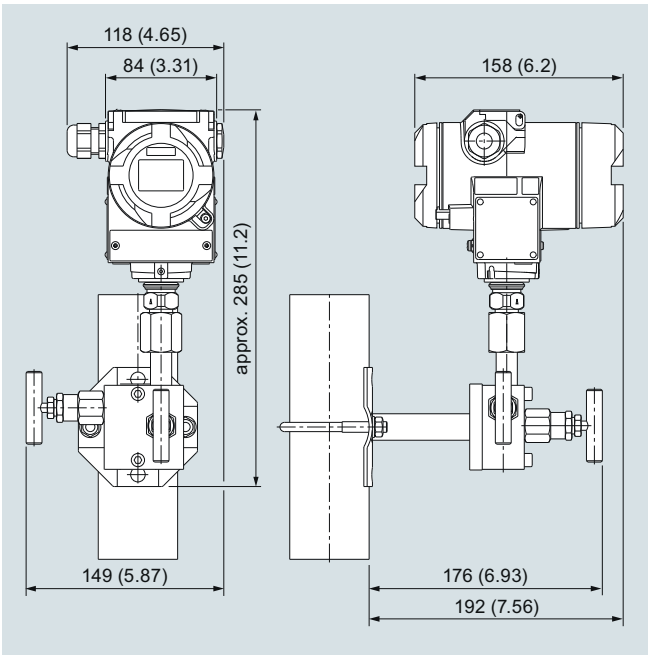
Dimensional drawings

Valve manifolds mounted on SITRANS P DS III

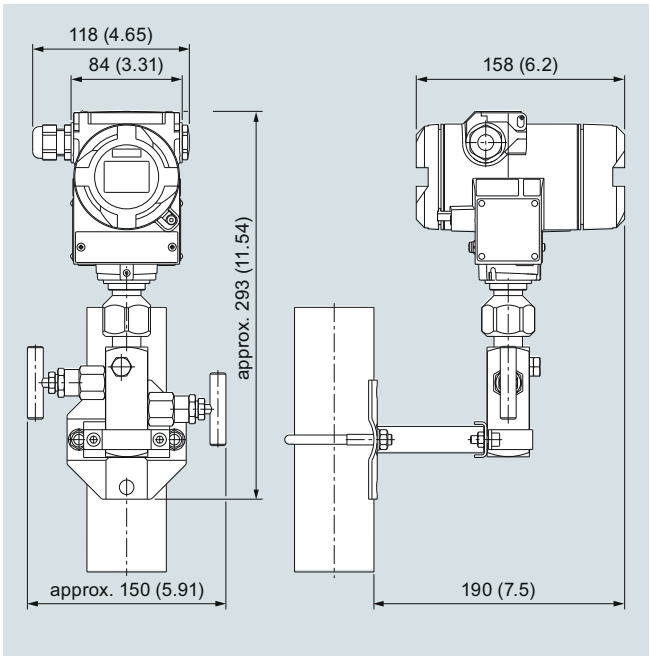


7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters

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



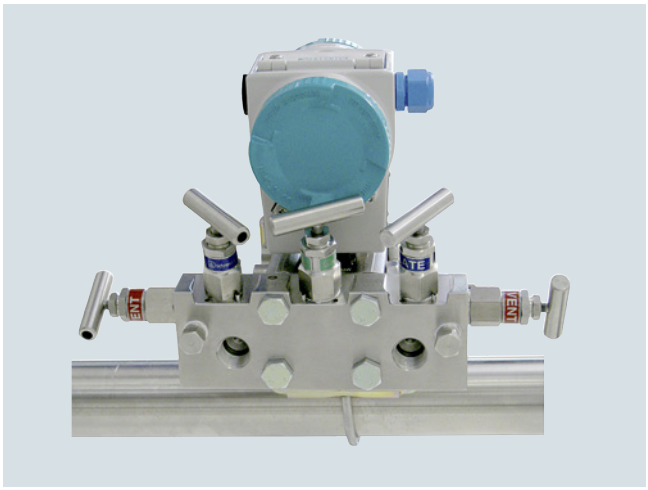
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)



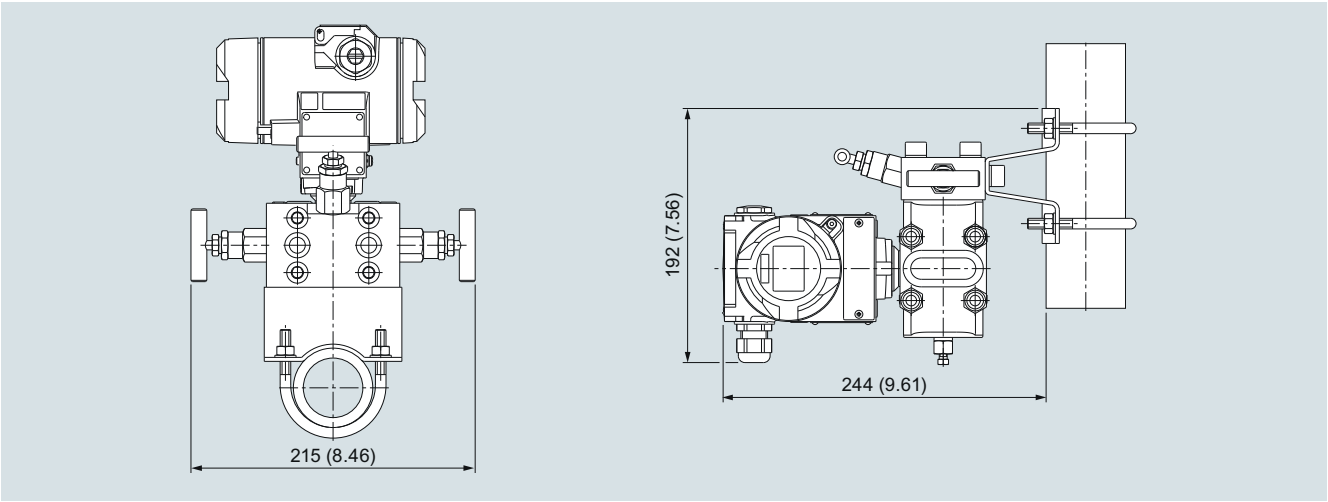
7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)

Factory-mounting of valve manifolds on transmitters

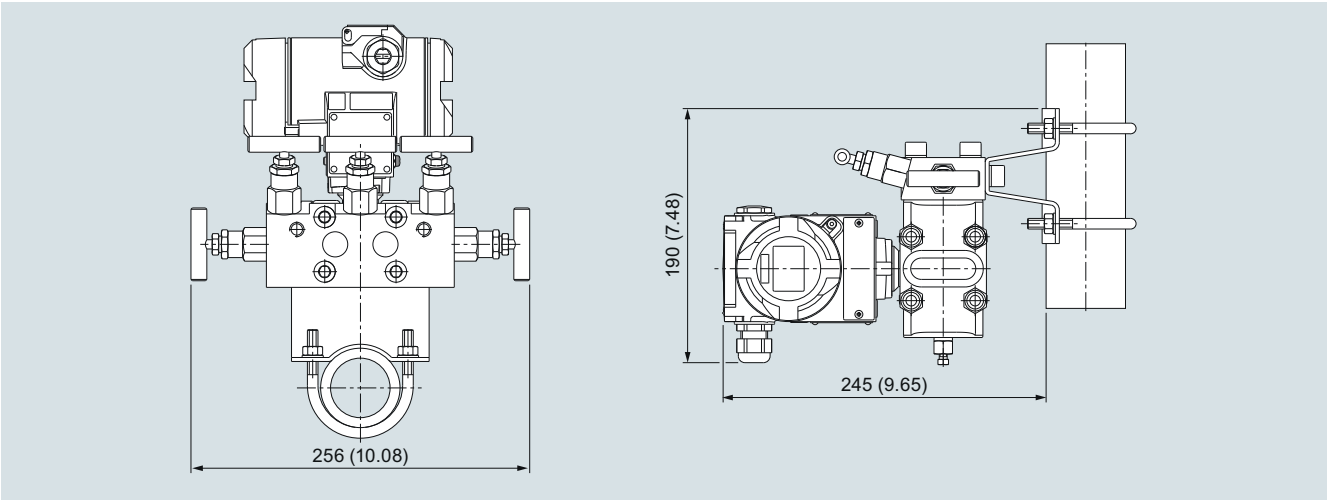
7MF9411-5BA valve manifold with mounted differential pressure transmitter



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

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

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

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

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

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

Benefits

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

Application

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

Pressure transmitters with type of protection "Flameproof enclosure" may be installed in hazardous areas (zone 1) or in zone 0. The pressure transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

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

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

The pressure transmitter can be operated locally over 3 input buttons or programmed externally over HART or over PROFIBUS PA or FOUNDATION Fieldbus interface.

Pressure transmitter for gauge pressure

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

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

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

Pressure transmitters for differential pressure and flow

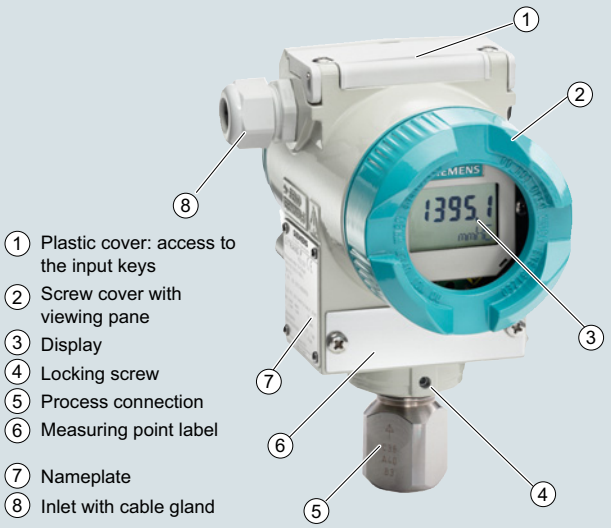
Measured variables:

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

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

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

Design



1. Plastic cover: access to the input keys
2. Screw cover with viewing pane
3. Display
4. Locking screw
5. Process connection
6. Measuring point label
7. Nameplate
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 Article No. is located on the side of the enclosure. 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).

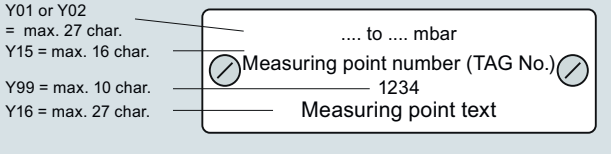
The approval label is located on the opposite side.

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

The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the enclosure 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.

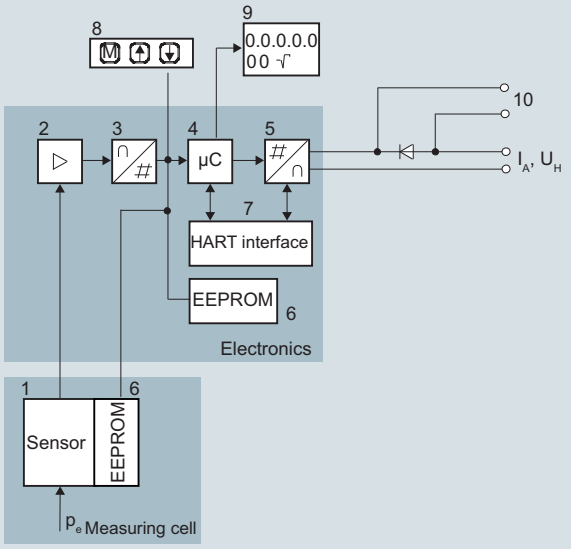
At the top of the enclosure is a plastic cover (1), which hides the input keys.

Example for an attached measuring point label



Function

Operation of electronics with HART communication



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

Function diagram of electronics

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

The diode circuit (10) protects against incorrect polarity.

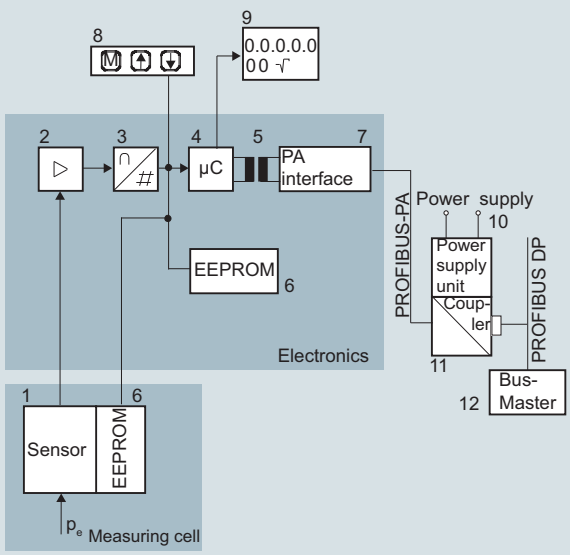
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

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

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

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

Operation of electronics with PROFIBUS PA communication



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

Function diagram of electronics

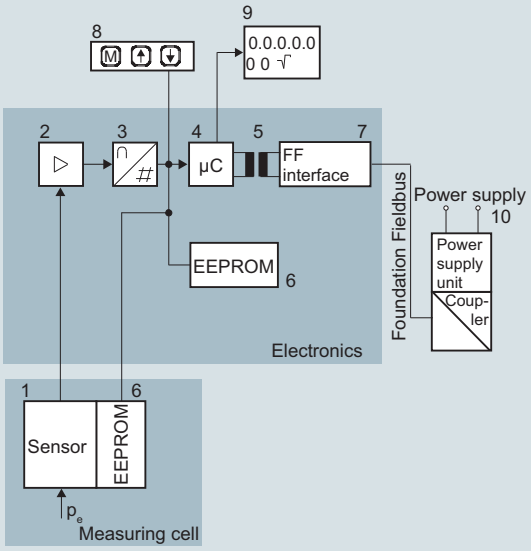
The bridge output voltage created by the sensor (1, Figure "Function diagram of the electronics") is amplified by the measuring amplifier (2) and digitized in the analog-to-digital converter (3). The digital information is evaluated in the microcontroller, its linearity and temperature response corrected,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

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

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

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

Operation of electronics with FOUNDATION Fieldbus communication



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

Function diagram of electronics

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

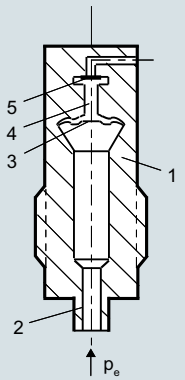
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

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

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

Mode of operation of the measuring cells

Measuring cell for gauge pressure

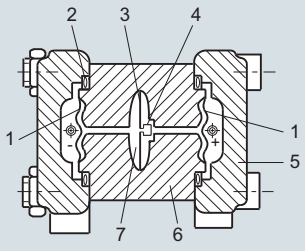


1	Measuring cell
2	Process connection
3	Seal diaphragm
4	Filling liquid
5	Silicon pressure sensor
p_e	Pressure as input variable

Measuring cell for gauge pressure, function diagram

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

Measuring cell for differential pressure and flow



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

Measuring cell for differential pressure and flow, function diagram

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

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

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

Parameterization SITRANS P410

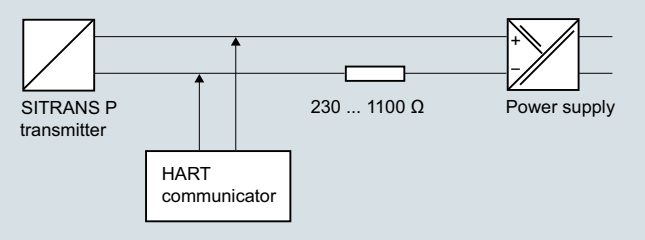
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

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

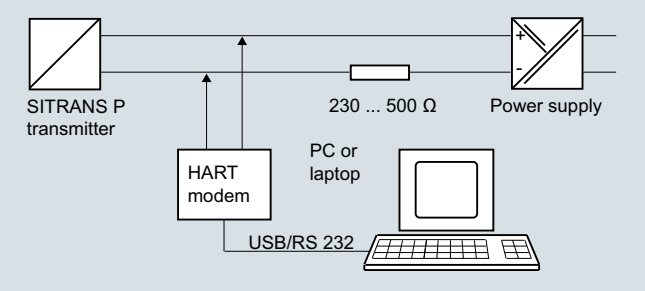
Parameterization using HART

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



Communication between a HART Communicator and a pressure transmitter

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



HART communication between a PC communicator and a pressure transmitter

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

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

Adjustable parameters, SITRANS P410 with HART

Parameters	Input keys (DS III HART)	HART communication
Lower range value	x	x
Upper range value	x	x
Electrical damping	x	x
Lower range value without application of a pressure ("Blind setting")	x	x
Upper range value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x[1)]
Type of dimension and actual dimension	x	x
Characteristic (linear / square-rooted)	x[2)]	x[2)]
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

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

Diagnostic functions for SITRANS P410 with HART

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

Available physical units of display for SITRANS P410 with HART

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm^2, kg/cm^2, inH_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
volume flow	m^3/d, m^3/h, m^3/s, l/min, l/s, ft^3/d, ft^3/min, ft^3/s, US gallon/min, US gallon/s
Mass flow	t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/d, g/h, g/min, g/s, lb/d, lb/h, lb/min, lb/s, LTon/d, LTon/h, STon/d, STon/h, STon/min
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

Parameterization through PROFIBUS PA interface

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

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

Parameterization through FOUNDATION Fieldbus interface

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

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

Adjustable parameters for SITRANS P410 with PROFIBUS PA and FOUNDATION Fieldbus

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

Technical description

Diagnostic functions for SITRANS P410 with PROFIBUS PA and FOUNDATION Fieldbus

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

Physical dimensions available for the display

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

Technical specifications

SITRANS P410 for gauge pressure

Input				
Measured variable	Gauge pressure			
Measuring span (infinitely adjustable) or nominal measuring range, max. operating pressure (in accordance with 97/23/EC Pressure Equipment Directive) and max. test pressure (pursuant to DIN 16086)	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**		
	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	1 bar 100 kPa 14.5 psi	4 bar 400 kPa 58 psi	6 bar 600 kPa 87 psi
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 psi	10 bar 1 MPa 145 psi
	0.16 ... 16 bar 16 ... 1600 kPa 2.3 ... 232 psi	16 bar 1600 kPa 232 psi	21 bar 2.1 MPa 305 psi	32 bar 3.2 MPa 464 psi
	0.63 ... 63 bar 63 ... 6300 kPa 9.1 ... 914 psi	63 bar 6300 kPa 914 psi	67 bar 6.7MPa 972 psi	100 bar 10 MPa 1450 psi
	1.6 ... 160 bar 0.16 ... 16 MPa 23 ... 2321 psi	160 bar 16 MPa 2321 psi	167 bar 16.7 MPa 2422 psi	250 bar 2.5 MPa 3626 psi
Lower measuring limit				
• Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a			
Upper measuring limit	100 % of max. measuring span			

Output	**HART**	**PROFIBUS PA/FOUNDATION Fieldbus**
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-
Load		
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V	-
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)	-
Physical bus	-	IEC 61158-2
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.	
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)	

for gauge pressure

SITRANS P410 for gauge pressure	
Measuring accuracy	Acc. to IEC 60770-1
Reference conditions	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Silicone oil filling • Room temperature 25 °C (77 °F)
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range
Error in measurement at limit setting incl. hysteresis and reproducibility	
• Linear characteristic	
- 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi	$r \leq 5$: ≤ 0.04 % $5 < r \leq 100$: ≤ (0.004 · r + 0.045) %
Influence of ambient temperature (in percent per 28 °C (50 °F))	
• 1 bar/100 kPa/14.5 psi	≤ (0.05 · r + 0.1) %
• 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi	≤ (0.025 · r + 0.125) %
Long-term stability (temperature change ± 30 °C (± 54 °F))	
• 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi	≤ (0.25 · r) % in 5 years
• 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi	≤ (0.125 · r) % in 5 years
Effect of mounting position	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° inclination (zero point correction is possible with position error compensation)
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range

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

SITRANS P410 for gauge pressure		
Certificates and approvals		
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 13 ATEX 2007 X	
- Marking	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 174 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC	To circuits with values: U_H = 9 ... 32 V DC
• Dust explosion protection for zone 20 (pending)	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Dust explosion protection for zone 21/22 (pending)	PTB 01 ATEX 2055	
- Marking	Ex II 2 D Ex tb IIIC T120°C Db	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC; P_{max} = 1.2 W	To circuits with values: U_H = 9 ... 32 V DC; P_{max} = 1 W
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	U_m = 45 V	U_m = 32 V
- Connections (Ex ic)	To circuits with values: U_i = 45 V	FISCO supply unit ic: U_o = 17.5 V, I_o = 570 mA Linear barrier: U_o = 32 V, I_o = 132 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion protection acc. to FM (pending)	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA (pending)	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

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

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

for gauge pressure

Selection and Ordering data	Article No.	Order code
Pressure transmitter for gauge pressure, SITRANS P410 with HART ↗	**7MF4033-** ▢▢▢▢▢ - ▢▢▢▢	**-Z C41**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling / **Measuring cell cleaning**		
Silicone oil / normal	1	
Measuring span (min. ... max.)		
0.01 ... 1 bar (0.15 ... 14.5 psi)	B	
0.04 ... 4 bar (0.58 ... 58 psi)	C	
0.16 ... 16 bar (2.32 ... 232 psi)	D	
0.63 ... 63 bar (9.14 ... 914 psi)	E	
1.6 ... 160 bar (23.2 ... 2320 psi)	F	
Wetted parts materials		
Seal diaphragm / Process connection		
Stainless steel / Stainless steel	A	
Hastelloy / Stainless steel	B	
Hastelloy / Hastelloy	C	
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" **(recommended version)** [1) 2) 3) 4)]	Y 1	
Version for diaphragm seals in conjunction with process connector "G½B connection shank" [1) 2) 3) 4)]	Y 0	
Process connection		
• Connection shank G½B to EN 837-1	0	
• Female thread ½-14 NPT	1	
• Stainless steel oval flange with process connection (Oval flange has no female thread)		
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518	2	
- Mounting thread M10 to DIN 19213	3	
- Mounting thread M12 to DIN 19213	4	
• Male thread M20 x 1.5	5	
• Male thread ½ -14 NPT	6	
Non-wetted parts materials		
• Enclosure made of die-cast aluminium	0	
• Enclosure stainless steel precision casting[5)]	3	
Version		
• Standard version, German plate inscription, setting for pressure unit: bar	1	
• International version, English plate inscription, setting for pressure unit: bar	2	
• Chinese version, English plate inscription, setting for pressure unit: Pascal	3	
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None	A	
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"	B	
- "Explosion-proof (Ex d)"[6)]	D	
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[7)]	P	
- "Ex nA/ic (Zone 2)"[8)]	E	
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[7)9)]	R	
• FM + CSA intrinsic safe (is) (pending)[10)]	F	
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[7)9)10)]	S	
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)"[6)10)]	N C	
Electrical connection / cable entry		
• Screwed gland M20 x1 .5	B	
• Screwed gland ½-14 NPT	C	
• Device plug Han 7D (plastic enclosure) incl. mating connector[11)]	D	
• Device plugs M12 (stainless steel)[11)12)]	F	

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

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

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

1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
2) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403.-..Y..-.... and 7MF4900-1...-.B
4) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
5) Not in conjunction with Electrical connection "device plug Han 7D".
6) Without cable gland, with blanking plug
7) With enclosed cable gland Ex ia and blanking plug
8) Configurations with device plugs Han and M12 are only available in Ex ic.
9) Only in connection with IP66.
10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
11) Only in connection with Ex approval A, B or E.
12) M12 delivered without cable socket

for gauge pressure

Selection and Ordering data	Article No.	Order code
Pressure transmitter for gauge pressure		
SITRANS P410 with PROFIBUS PA (PA)	↗ **7MF4034-** ▢▢▢▢▢ - ▢▢▢	**-Z C41**
SITRANS P410 with FOUNDATION Fieldbus (FF)	↗ **7MF4035-** ▢▢▢▢▢ - ▢▢▢	**-Z C41**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Measuring cell filling / **Measuring cell cleaning**		
Silicone oil / normal	**1**	
Nominal measuring range		
1 bar (14.5 psi)	**B**	
4 bar (58 psi)	**C**	
16 bar (232 psi)	**D**	
63 bar (914 psi)	**E**	
160 bar (2320 psi)	**F**	
Wetted parts materials		
Seal diaphragm / Process connection		
Stainless steel / Stainless steel	**A**	
Hastelloy / Stainless steel	**B**	
Hastelloy / Hastelloy	**C**	
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" **(recommended version)** [1) 2) 3) 4)]	**Y 1**	
Version for diaphragm seals in conjunction with process connector "G½B connection shank" [1) 2) 3) 4)]	**Y 0**	
Process connection		
• Connection shank G½B to EN 837-1	**0**	
• Female thread ½-14 NPT	**1**	
• Stainless steel oval flange with process connection (Oval flange has no female thread) [5)]		
- Mounting thread $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518	**2**	
- Mounting thread M10 to DIN 19213	**3**	
- Mounting thread M12 to DIN 19213	**4**	
• Male thread M20 x 1.5	**5**	
• Male thread ½ -14 NPT	**6**	
Non-wetted parts materials		
• Enclosure made of die-cast aluminium	**0**	
• Enclosure stainless steel precision casting	**3**	
Version		
• Standard version, German label inscription, setting of pressure unit: bar	**1**	
• International version, English label inscription, setting of pressure unit: psi	**2**	
• Chinese version, English label inscription, setting of pressure unit: kPa	**3**	
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None	**A**	
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"	**B**	
- "Explosion-proof (Ex d)"[6)]	**D**	
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[7)]	**P**	
- "Ex nA/ic (Zone 2)"[8)]	**E**	
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[7) 9)]	**R**	
• FM + CSA intrinsic safe (is)[10)]	**F**	
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[7)9)10)]	**S**	
• With FM + CSA, Type of protection:		
- "Intrinsic Safe and Explosion Proof (is + xp)"[6)10)]	**N C**	
Electrical connection/cable entry		
• Screwed gland M20 x 1.5	**B**	
• Screwed gland ½-14 NPT	**C**	
• Device plugs M12 (stainless steel)[11) 12)]	**F**	

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

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

1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
2) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403.-..Y..-.... and 7MF4900-1...-.B
4) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
5) M10 fastening thread: Max. measuring span 160 bar (2320 psi)
7/16-20 UNF and M12 fastening thread: Max. measuring span 400 bar (5802 psi)
6) Without cable gland, with blanking plug.
7) With enclosed cable gland Ex ia and blanking plug.
8) Configurations with device plugs Han and M12 are only available in Ex ic.
9) Only in connection with IP66.
10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
11) M12 delivered without cable socket.
12) Only in connection with Ex approval A, B, E or F.

1

for gauge pressure

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

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

Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/253).

1) Device plug Han IP65

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

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

4) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.

5) Cannot be ordered with remote seal.

6) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

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

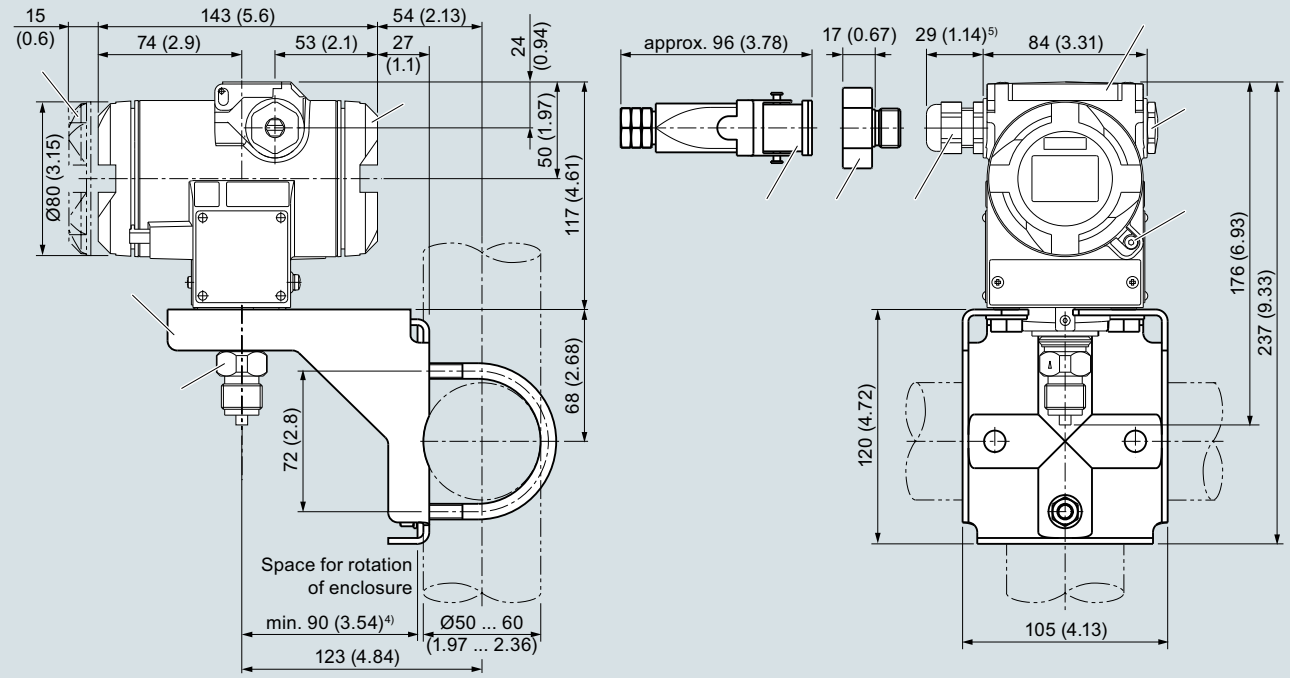
✓ = available

Ordering example

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

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

Dimensional drawings



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

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

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

Technical specifications

SITRANS P410 for differential pressure and flow

Input			
Measured variable	Differential pressure and flow		
Measuring span (infinitely adjustable) or nominal measuring range and maximum operating pressure (pursuant to 2014/68/EU Pressure Equipment Directive)	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**	
	Measuring span	Nominal measuring range	Max. operating pressure MAWP (PS)
	2.5 ... 250 mbar 0.2 ... 25 kPa 1 ... 100 inH_2O	250 mbar 25 kPa 100 inH_2O	160 bar 16 MPa 2320 psi
	6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH_2O	600 mbar 60 kPa 240 inH_2O	
	16 ... 1600 mbar 1.6 ...160 kPa 6.4 ... 642 inH_2O	1600 mbar 160 kPa 642 inH_2O	
	50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH_2O	5000 mbar 500 kPa 2000 inH_2O	
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi	
	6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH_2O	600 mbar 60 kPa 240 inH_2O	420 bar 42 MPa 6091 psi
	16 ... 1600 mbar 1.6 ...160 kPa 6.4 ... 642 inH_2O	1600 mbar 160 kPa 642 inH_2O	
	50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH_2O	5000 mbar 500 kPa 2000 inH_2O	
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi	
Lower measuring limit			
• Measuring cell with silicone oil filling	-100 % of max. measuring span (-33 % with measuring cell 30 bar/3 MPa/435 psi) or 30 mbar a/3 kPa a/0.44 psi a		
Upper measuring limit	100 % of max. measuring span		
Lower range value	Between the measuring limits (fully adjustable)		
Output	**HART**		**PROFIBUS PA/ FOUNDATION Fieldbus**
Output signal	4 ... 20 mA		Digital PROFIBUS PA and FOUNDATION Fieldbus signal
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA		-
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA		-
Load			
• Without HART	$R_B \leq (U_H - 10.5\ V)/0.023\ A$ in Ω, U_H: Power supply in V		-
• With HART	R_B = 230 ... 500 Ω (SIMATIC PDM) or R_B = 230 ... 1100 Ω (HART Communicator)		-
Physical bus	-		IEC 61158-2
Protection against polarity reversal	Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.		
Electrical damping (step width 0.1 s)	Set to 2 s (0 ... 100 s)		

SITRANS P410 for differential pressure and flow	
Measuring accuracy	Acc. to IEC 60770-1
Reference conditions	• Increasing characteristic • Lower range value 0 bar/kPa/psi • Stainless steel seal diaphragm • Silicone oil filling • Room temperature 25 °C (77 °F)
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nominal measuring range
Error in measurement at limit setting incl. hysteresis and reproducibility	
• Linear characteristic	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5$: ≤ 0.04 % $5 < r \leq 100$: ≤ (0.004 · r + 0.045) %
• Square-rooted characteristic (flow > 50 %)	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5$: ≤ 0.04 % $5 < r \leq 100$: ≤ (0.004 · r + 0.045) %
• Square-rooted characteristic (flow > 25 ... 50 %)	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5$: ≤ 0.08 % $5 < r \leq 100$: ≤ (0.008 · r + 0.09) %
Influence of ambient temperature (in percent per 28 °C (50 °F))	
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	≤ (0.025 · r + 0.125) %
Influence of static pressure	
• on the lower range value	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi	≤ (0.1 · r) % per 70 bar (zero offset is possible with position error adjustment)
- 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	≤ (0.2 · r) % per 70 bar (zero offset is possible with position error adjustment)
• on the measuring span	
- 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	≤ 0.14 % per 70 bar
Long-term stability (temperature change ± 30 °C (± 54 °F))	Static pressure max. 70 bar/7 MPa/1015 psi
• 250 mbar/25 kPa/3.63 psi 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi	≤ (0.125 · r) % in 5 years
• 30 bar/3 MPa/435 psi	≤ (0.25 · r) % in 5 years
Effect of mounting position (in pressure per change in angle)	≤ 0.7 mbar/0.07 kPa/0.028 inH_2O per 10° inclination (zero offset is possible with position error adjustment)
Effect of auxiliary power supply (in percent per change in voltage)	0.005 % per 1 V
Measuring value resolution for PROFIBUS PA and FOUNDATION Fieldbus	$3 \cdot 10^{-5}$ of nominal measuring range

SITRANS P410 for differential pressure and flow		
Operating conditions		
Degree of protection		
• according to EN 60529	IP66 (optional IP66/IP68)	
• according to NEMA 250	Type 4X	
Temperature of medium		
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) with 30 bar measuring cell	
• In conjunction with dust explosion protection	-20 ... +60 °C (-4 ... +140 °F)	
Ambient conditions		
• Ambient temperature		
- Transmitter	-40 ... +85 °C (-40 ... +185 °F)	
- Display readable	-30 ... +85 °C (-22 ... +185 °F)	
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)	
• Climatic class		
- Condensation	Relative humidity 0 ... 100 % Condensation permissible, suitable for use in the tropics	
• Electromagnetic Compatibility		
- Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21	
Design		
Weight (without options)	Die-cast aluminum: ≈ 4.5 kg (≈ 9.9 lb) Stainless steel precision casting: ≈ 7.1 kg (≈ 15.6 lb)	
Enclosure material	Low-copper die-cast aluminum, GD-AlSi12 or stainless steel precision casting, mat. no. 1.4408	
Wetted parts materials		
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819	
• Process flanges and sealing screw	Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602	
• O-Ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR	
Measuring cell filling	Silicone oil or inert filling liquid (maximum value with oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))	
Process connection	Female thread ¼-18 NPT and flange connection with mounting thread M10 to DIN 19213 or $^{7}/_{16}$-20 UNF to IEC 61518/DIN EN 61518	
Material of mounting bracket		
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated	
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)	
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)	
Power supply U_H	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate supply voltage	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

SITRANS P410 for differential pressure and flow		
Certificates and approvals	**HART**	**PROFIBUS PA/ FOUNDATION Fieldbus**
Classification according to PED 2014/68/EU	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)	
Explosion protection		
• Intrinsic safety "i"	PTB 13 ATEX 2007 X	
- Marking	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +70 °C (-40 ... +158 °F) temperature class T5; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW; R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1.2 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion-proof "d"	PTB 99 ATEX 1160	
- Marking	Ex II 1/2 G Ex d IIC T4/T6 Ga/Gb	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC	To circuits with values: U_H = 9 ... 32 V DC
• Dust explosion protection for zone 20 (pending)	PTB 01 ATEX 2055	
- Marking	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)	
- Max. surface temperature	120 °C (248 °F)	
- Connection	To certified intrinsically-safe circuits with peak values: U_i = 30 V, I_i = 100 mA, P_i = 750 mW, R_i = 300 Ω	FISCO supply unit: U_o = 17.5 V, I_o = 380 mA, P_o = 5.32 W Linear barrier: U_o = 24 V, I_o = 250 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Dust explosion protection for zone 21/22 (pending)	PTB 01 ATEX 2055	
- Marking	Ex II 2 D Ex tb IIIC T120°C Db	
- Connection	To circuits with values: U_H = 10.5 ... 45 V DC; P_{max} = 1.2 W	To circuits with values: U_H = 9 ... 32 V DC; P_{max} = 1 W
• Type of protection "n" (zone 2)	PTB 13 ATEX 2007 X	
- Marking	Ex II 2/3 G Ex nA IIC T4/T5/T6 Gb/Gc Ex II 2/3 G Ex ic IIC T4/T5/T6 Gb/Gc	
- Connection (Ex nA)	U_m = 45 V	U_m = 32 V
- Connection (Ex ic)	To circuits with values: U_i = 45 V	FISCO supply unit ic: U_o = 17.5 V, I_o = 570 mA Linear barrier: U_o = 32 V, I_o = 132 mA, P_o = 1 W
- Effective internal inductance/capacitance	L_i = 0.4 mH, C_i = 6 nF	L_i = 7 µH, C_i = 1.1 nF
• Explosion protection acc. to FM (pending)	Certificate of Compliance 3008490	
- Identification (XP/DIP) or (IS); (NI)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; CL I, ZN 0/1 AEx ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	
• Explosion protection to CSA (pending)	Certificate of Compliance 1153651	
- Identification (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4...T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4...T6; CL I, DIV 2, GP ABCD T4...T6; CL II, DIV 2, GP FG; CL III	

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

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

for differential pressure and flow

Selection and Ordering data		Article No.	Order Code
SITRANS P410 with HART pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)	↗	**7MF4433-** ▢▢▢▢▢ - ▢▢▢▢	**-Z C41**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring cell filling	**Measuring cell cleaning**		
Silicone oil	normal	**1**	
Measuring span (min. ... max.)			
2.5 ... 250 mbar	(1.004 ... 100.4 inH_2O)	**D**	
6 ... 600 mbar	(2.409 ... 240.9 inH_2O)	**E**	
16 ... 1600 mbar	(6.424 ... 642.4 inH_2O)	**F**	
50 ... 5000 mbar	(20.08 ... 2008 inH_2O)	**G**	
0.3 ... 30 bar	(4.35 ... 435 psi)	**H**	
Wetted parts materials (stainless steel process flanges)			
Seal diaphragm	Parts of measuring cell		
Stainless steel	Stainless steel	**A**	
Hastelloy	Stainless steel	**B**	
Hastelloy	Hastelloy	**C**	
Version for diaphragm seal[1) 2) 3) 4)]		**Y**	
Process connection			
Female thread ¼-18 NPT with flange connection			
• Sealing screw opposite process connection			
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		**2**	
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		**0**	
• Vent on side of process flange[5)]			
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		**6**	
- Mounting thread M10 to DIN 19213 (only for replacement requirement)		**4**	
Non-wetted parts materials			
process flange screws	Electronics enclosure		
Stainless steel	Die-cast aluminum	**2**	
Stainless steel	Stainless steel precision casting[6)]	**3**	
Version			
• Standard version, German plate inscription, setting for pressure unit: bar		**1**	
• International version, English plate inscription, setting for pressure unit: bar		**2**	
• Chinese version, English plate inscription, setting for pressure unit: Pascal		**3**	
All versions include DVD with compact operating instructions in various EU languages.			
Explosion protection			
• None		**A**	
• With ATEX, Type of protection:			
- "Intrinsic safety (Ex ia)"		**B**	
- "Explosion-proof (Ex d)"[7)]		**D**	
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[8)]		**P**	
- "Ex nA/ic (Zone 2)"[9)]		**E**	
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"[8)10)]		**R**	
• FM + CSA intrinsic safe (is) (pending)[11)]		**F**	
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[8)10)11)]		**S**	
• With FM + CSA, Type of protection:			
- "Intrinsic Safe and Explosion Proof (is + xp)"[7)11)]		**N**	**C**

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

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

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

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

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

3) The diaphragm seal is to be specified with a separate order number and must be included wiht the transmitter order number, for example 7MF443.-..Y..-.... and 7MF4900-1...-.B

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

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

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

7) Without cable gland, with blanking plug

8) With enclosed cable gland Ex ia and blanking plug

9) Configurations with device plugs Han and M12 are only available in Ex ic.

10) Only in connection with IP66.

11) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.

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

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

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

15) M12 delivered without cable socket.

for differential pressure and flow

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

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

Nominal measuring range

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

Wetted parts materials

(stainless steel process flanges)

Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	**A**
Hastelloy	Stainless steel	**B**
Hastelloy	Hastelloy	**C**
Version as diaphragm seal [1) 2) 3) 4)]		**Y**

Process connection

Female thread ¼-18 NPT with flange connection

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

Non-wetted parts materials

process flange screws	Electronics enclosure	
Stainless steel	Die-cast aluminum	**2**
Stainless steel	Stainless steel precision casting	**3**

Version

• Standard version, German plate inscription, setting for pressure unit: bar	**1**
• International version, English plate inscription, setting for pressure unit: bar	**2**
• Chinese version, English plate inscription, setting for pressure unit: Pascal	**3**

All versions include DVD with compact operating instructions in various EU languages.

Explosion protection

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

Electrical connection/cable entry

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

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

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

1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
2) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
3) The diaphragm seal is to be specified with a separate order number and must be included wiht the transmitter order number, for example 7MF443.-..Y..-.... and 7MF4900-1...-.B
4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
5) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).
6) Without cable gland, with blanking plug.
7) With enclosed cable gland Ex ia and blanking plug.
8) Configurations with device plugs Han and M12 are only available in Ex ic.
9) Only in connection with IP66.
10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
11) Only in connection with Ex approval A, B, E or F.
12) M12 delivered without cable socket

for differential pressure and flow

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

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

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

Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/253).

✓ = available

1) Device plug Han IP65
2) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
3) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
4) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D
5) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.
6) Not suitable for connection of remote seal.
7) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

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

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

✓ = available

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

for differential pressure and flow

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

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

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

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

1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
2) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
3) The diaphragm seal is to be specified with a separate order number and must be included wiht the transmitter order number, for example 7MF453.-..Y..-.... and 7MF4900-1....-.B
4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
5) Not in conjunction with Electrical connection "device plug Han 7D".
6) Without cable gland, with blanking plug
7) With enclosed cable gland Ex ia and blanking plug
8) Configurations with device plugs Han and M12 are only available in Ex ic.
9) Only in connection with IP66.
10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
11) Only in connection with Ex approval A, B or E.
12) Permissible only for crimp-contact of conductor cross-section 1 mm^2
13) Only in connection with Ex approval A, B, E or F.
14) M12 delivered without cable socket.

for differential pressure and flow

Selection and Ordering data	Article No.	Order Code
Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)		
SITRANS P410 with PROFIBUS PA (PA)	↗ **7MF4534-** ■■■■■ - ■■■	**-Z C41**
SITRANS P410 with FOUNDATION Fieldbus (FF)	↗ **7MF4535-** ■■■■■ - ■■■	**-Z C41**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		

Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	**1**
Nominal measuring range		
600 mbar	(240 inH_2O)	**E**
1600 mbar	(642 inH_2O)	**F**
5 bar	(2000 inH_2O)	**G**
30 bar	(435 psi)	**H**
Wetted parts materials		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	**A**
Hastelloy	Stainless steel	**B**
Version for diaphragm seal [1) 2) 3) 4)]		**Y**
Process connection		
Female thread ¼-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		**3**
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		**1**
• Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing).		
- Mounting thread $^7/_{16}$-20 UNF to IEC 61518/DIN EN 61518		**7**
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		**5**
Non-wetted parts materials		
Process flange screws	Electronics enclosure	
Stainless steel	Die-cast aluminum	**2**
Stainless steel	Stainless steel precision casting	**3**
Version		
• Standard version, German plate inscription, setting for pressure unit: bar		**1**
• International version, English plate inscription, setting for pressure unit: bar		**2**
• Chinese version, English plate inscription, setting for pressure unit: Pascal		**3**
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
• None		**A**
• With ATEX, Type of protection:		
- "Intrinsic safety (Ex ia)"		**B**
- "Explosion-proof (Ex d)"[5)]		**D**
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"[6)]		**P**
- "Ex nA/ic (Zone 2)" [7)]		**E**
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"[6)8)]		**R**
• FM + CSA intrinsic safe (is) (pending)[9)]		**F**
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D[6)7)9)]		**S**
• With FM + CSA, Type of protection:		
- "Intrinsic safety and explosion-proof (is + xp)"[6)9)], max PN 360		**N C**
Electrical connection/cable entry		
• Screwed gland M20 x 1.5		**B**
• Screwed gland ½-14 NPT		**C**
• Device plugs M12 (stainless steel) [10) 11)]		**F**

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

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

1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
2) If the inspection certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
3) The diaphragm seal is to be specified with a separate order number and must be included wiht the tranmitter order number, for example 7MF453.-..Y..-.... and 7MF4900-1....-.B
4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
5) Without cable gland, with blanking plug.
6) With enclosed cable gland Ex ia and blanking plug.
7) Configurations with device plugs Han and M12 are only available in Ex ic.
8) Only in connection with IP66.
9) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
10) Only in connection with Ex approval A, B, E or F.
11) M12 delivered without cable socket

for differential pressure and flow

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

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

Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/253).

1) Device plug Han IP65
2) Option does not contain gas explosion protection; only dust explosion protection: Use in or at Zone 1D/2D.
3) When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.
4) Blanking plug is standard configuration. Order option A40 if a vent valve is required instead of a blanking plug.

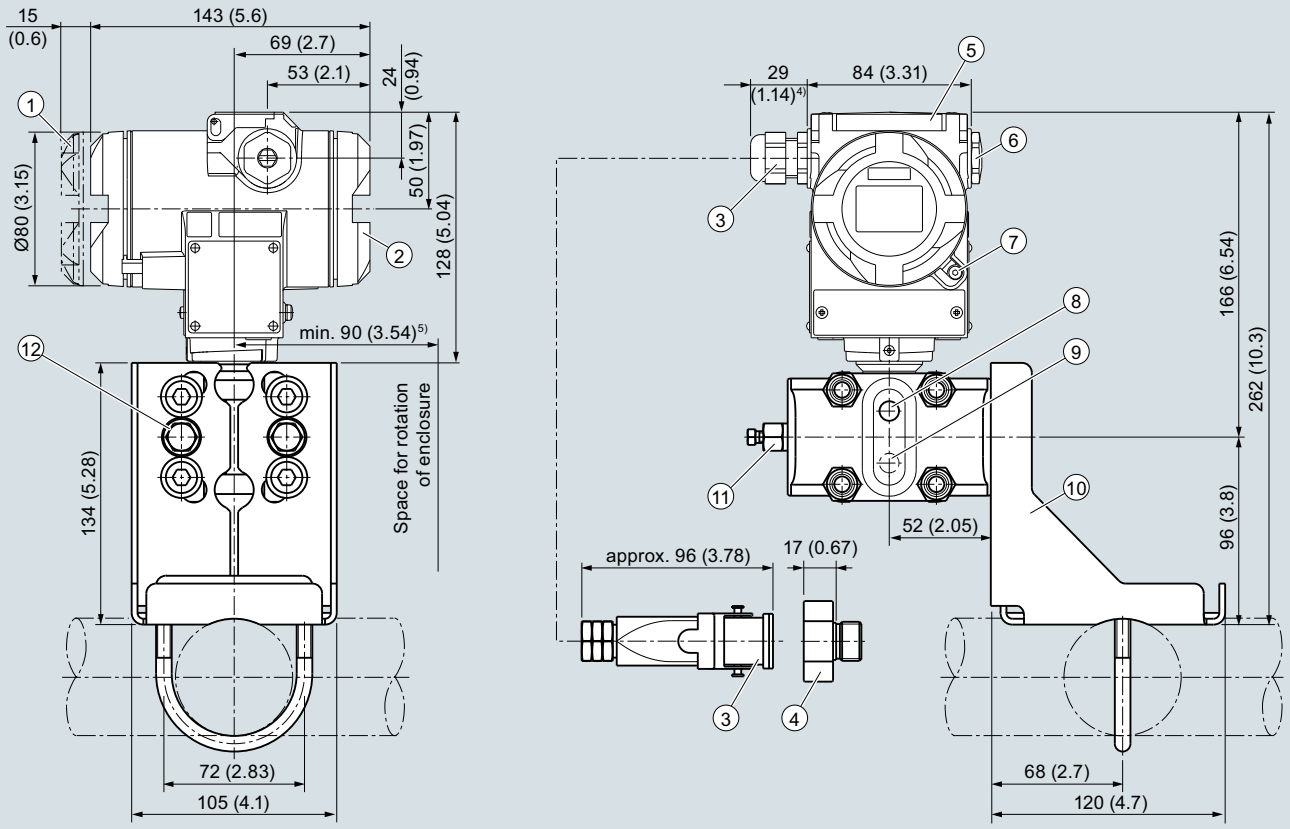
Selection and Ordering data	Order code			
Additional data		**HART**	**PA**	**FF**
Please add "**-Z**" to Article No. and specify Order code(s) and plain text.				
Measuring range to be set Specify in plain text:				
• in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ...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

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

✓ = available

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

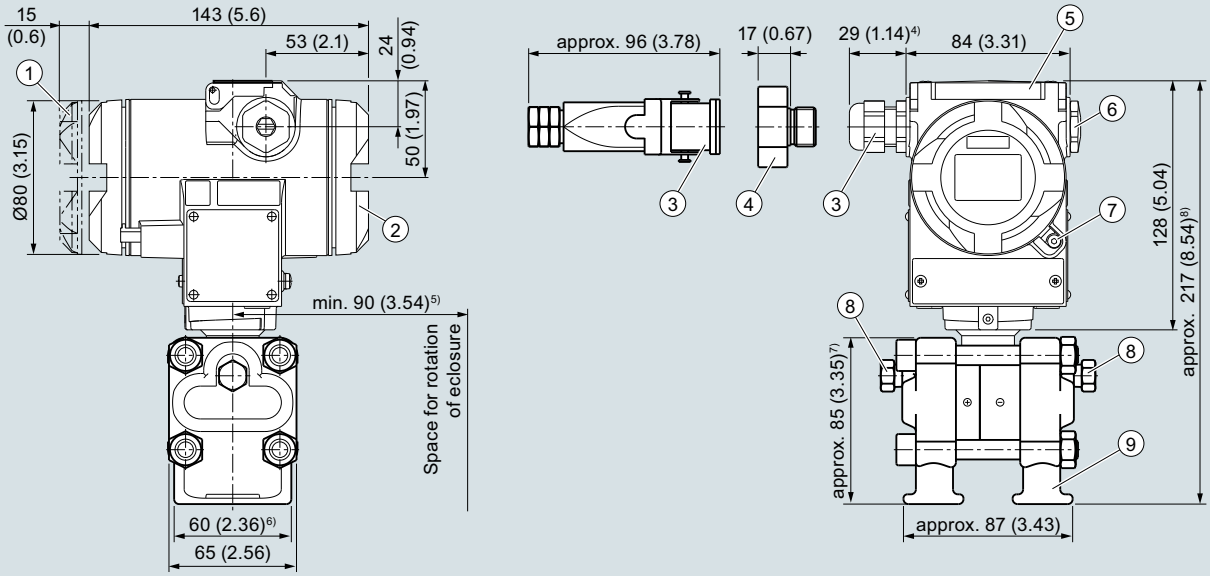
Dimensional drawings



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

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

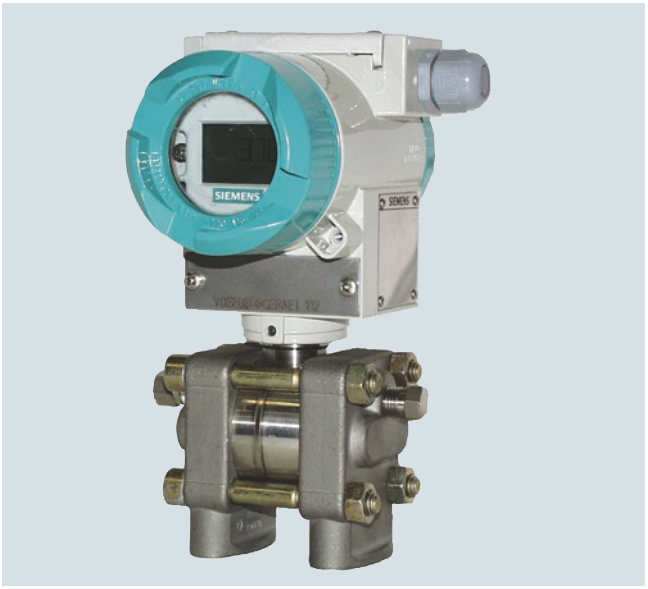
SITRANS P410 pressure transmitters for differential pressure and flow, dimensions in mm (inch)



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

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

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



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

Accessories/Spare parts

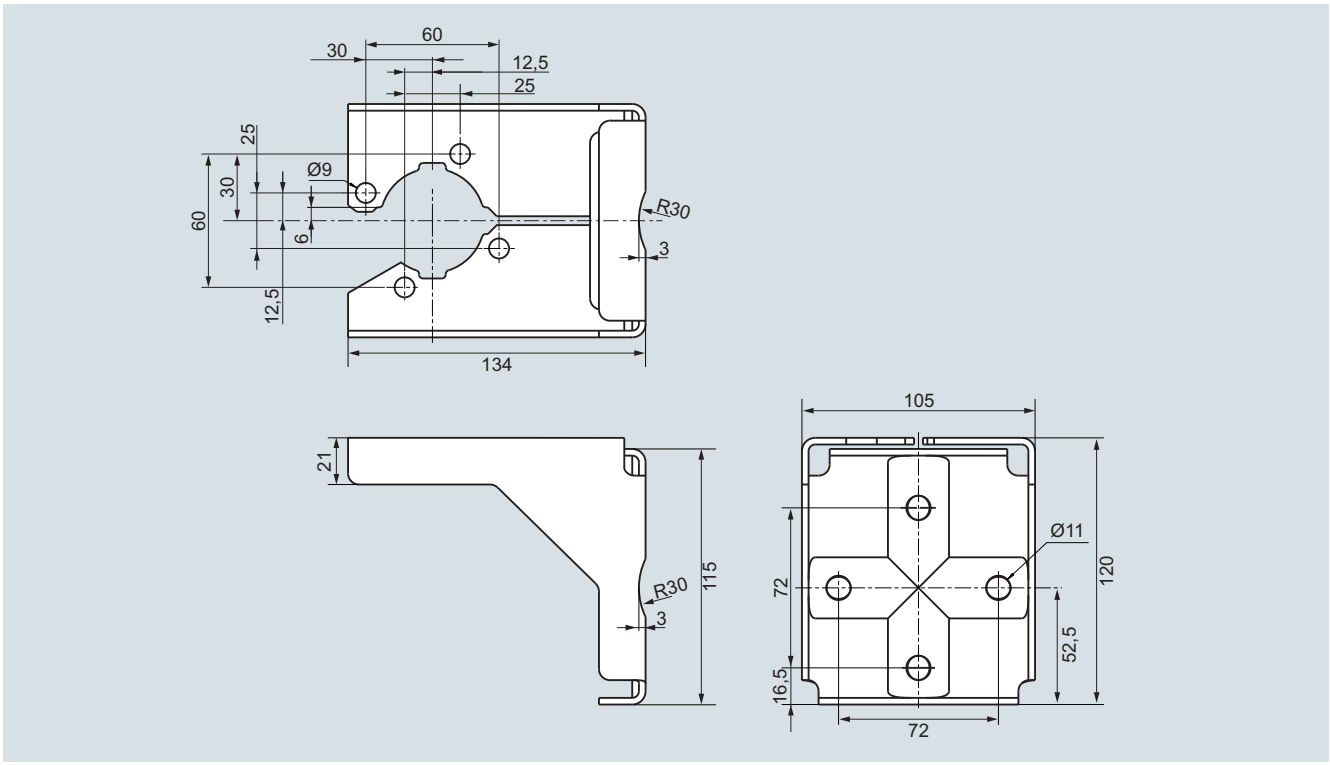
Selection and Ordering data	Article No.
Accessories/Spare parts	
Mounting bracket and fastening parts for pressure transmitters	
SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF403.-.....-..C.)	
• made of steel	**7MF4997-1AB**
• made of stainless steel 304/1.4301	**7MF4997-1AH**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

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

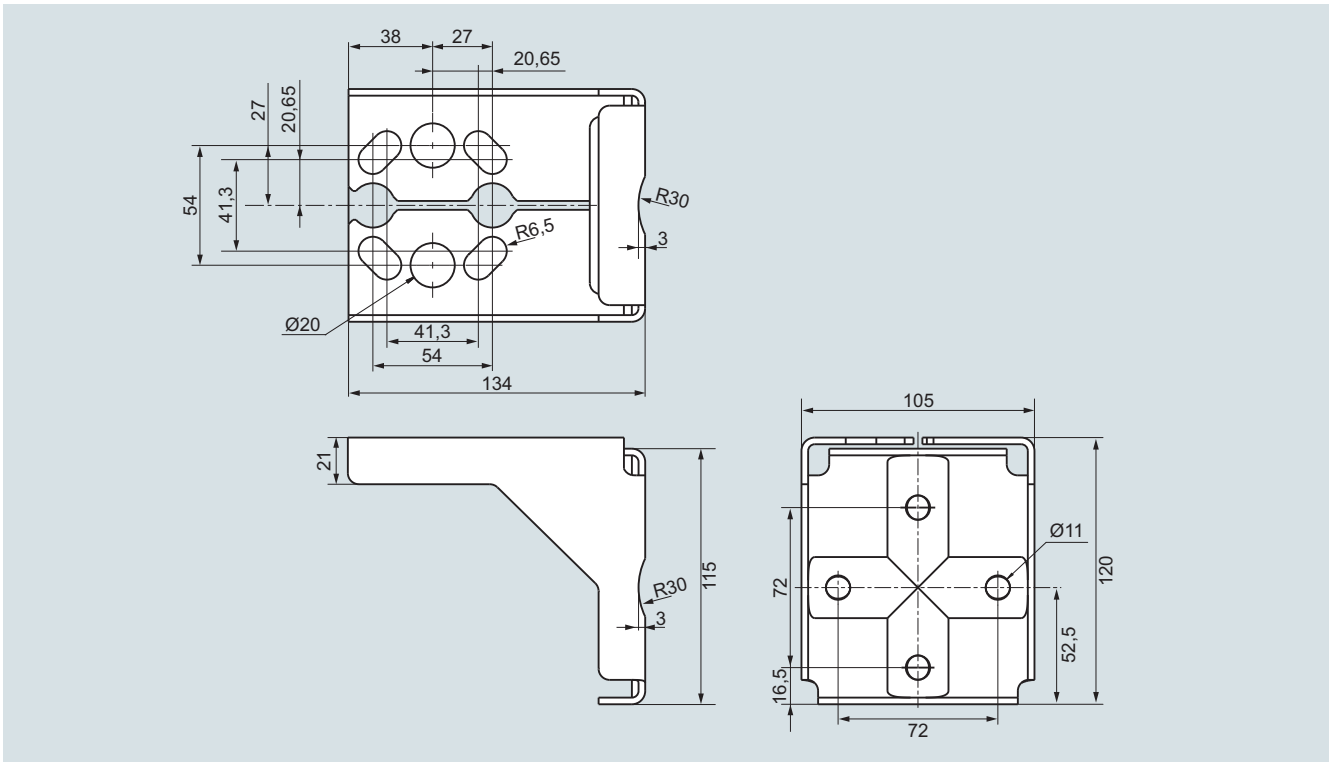
Selection and Ordering data	Article No.
Documentation	
The entire documentation is available for download free-of-charge in various languages at: http://www.siemens.com/processinstrumentation/documentation	
Compact operating instructions SITRANS P DS III/P410	
• English, German, Spanish, French, Italian,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

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

Dimensional drawings



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



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

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 measuring spans of 1 mbar to 32 bar (0.0145 to 465 psi; 0.4 to 12860 inH_2O)
- 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 temperature of mediums 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.

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"))
- Measuring span (freely adjustable) for SITRANS P500: 1 mbar to 32 bar (0.0145 to 465 psi; 0.4 to 12860 inH_2O)

Pressure transmitters for level

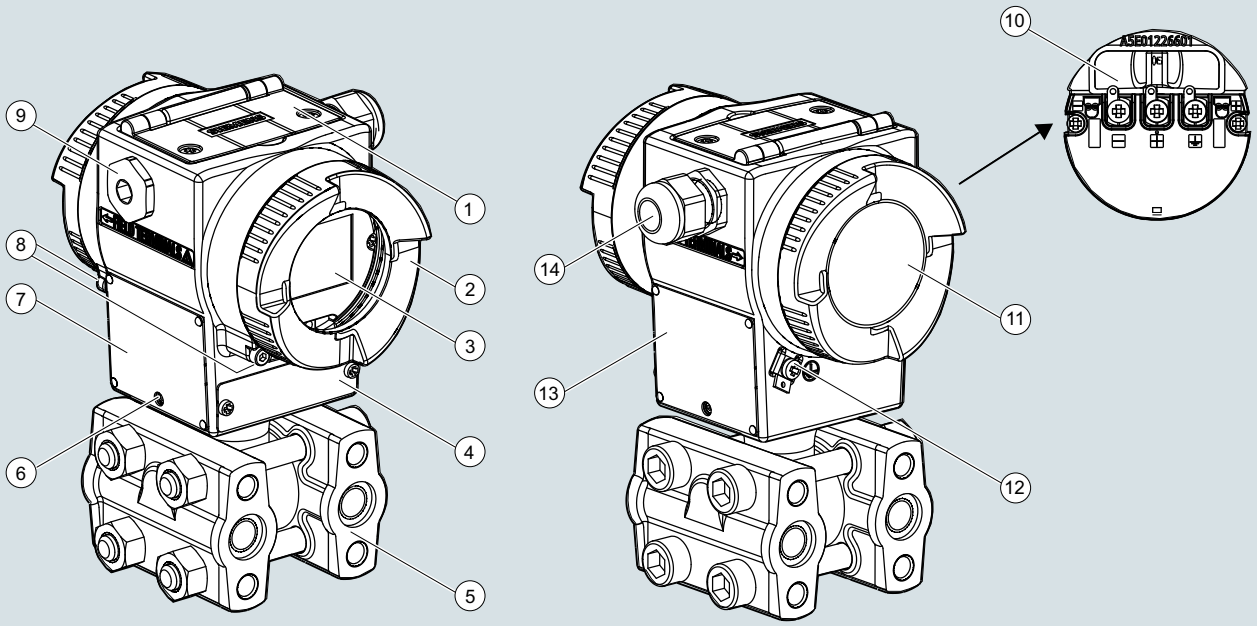
- Measured variable: Level of aggressive and non-aggressive liquids in open and closed vessels.
- Measuring span (freely adjustable) for SITRANS P500: 1.25 to 6250 mbar (0.5 to 2509 inH_2O)
- Nominal diameter of the mounting flange
  - DN 50 / PN 40
  - DN 80 / PN 40
  - DN 100/ PN 16, PN 40
  - 2 inch/class 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



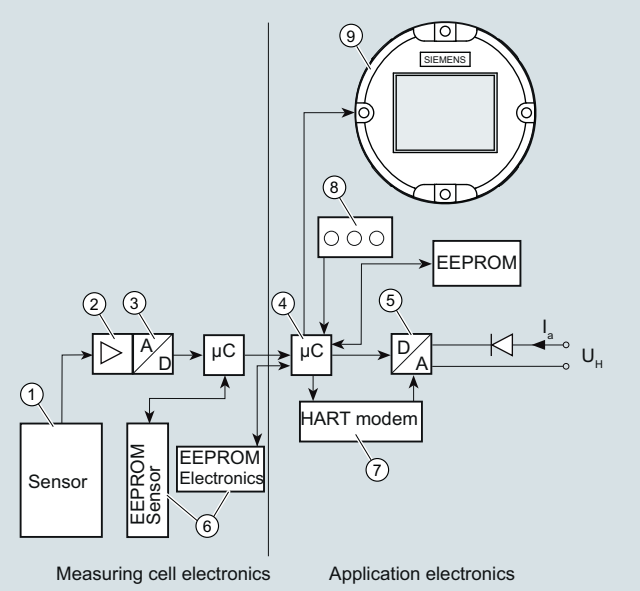
1. Cover over buttons
2. Cover, optionally with inspection window
3. Local display (optional)
4. Tag plate
5. Process flange with process connection
6. Retaining screws (on two sides) for the measuring cell
7. Approval label
8. Safety catch
9. Blanking plug
10. Electrical terminal compartment
11. Cover for electrical terminal compartment
12. Protective conductor connector
13. Nameplate
14. Cable inlet, optionally with cable gland or plug-in connection

View of transmitter

- The electronics enclosure is made of coated die-cast aluminum.
- The enclosure 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 enclosure.
- Access to the terminal compartment for auxiliary power and shielding by unscrewing the cover.
- Beneath the electronic enclosure 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 enclosure 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

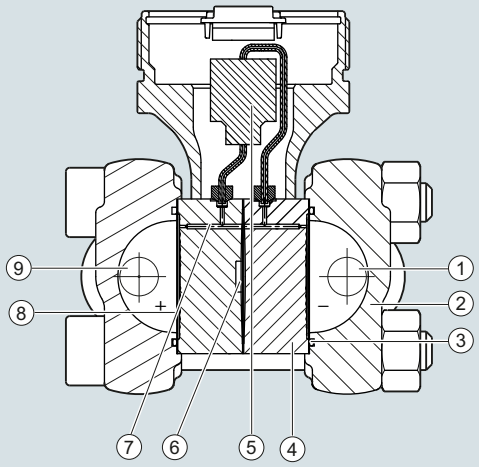
- The input pressure is converted into an electrical signal by the sensor.
- This signal is amplified by the measuring amplifier and digitalized in an analog-to-digital converter.
- The digital signal is analyzed in a microcontroller and corrected according to linearity and thermal characteristics.
- 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



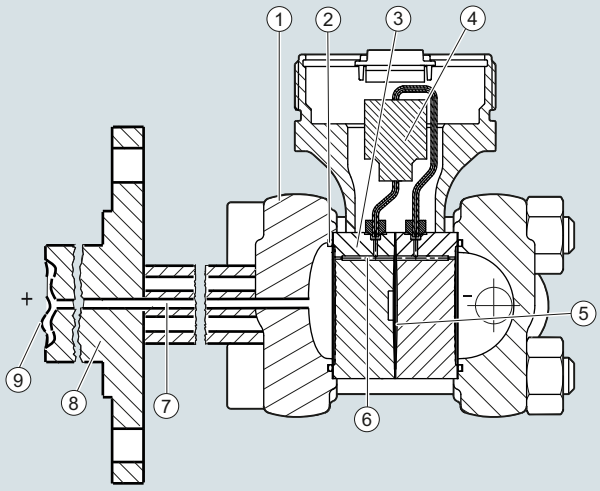
1 Input pressure P-
2 Process flange with process connection
3 O-Ring
4 Measuring cell body
5 Silicon pressure sensor
6 Overload diaphragm
7 Filling liquid
8 Seal diaphragm
9 Input pressure P+

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 the seal diaphragm touches the body of the measuring cell. This protects the sensor module 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.

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 the seal diaphragm touches the body of the measuring cell. This protects the sensor module 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.

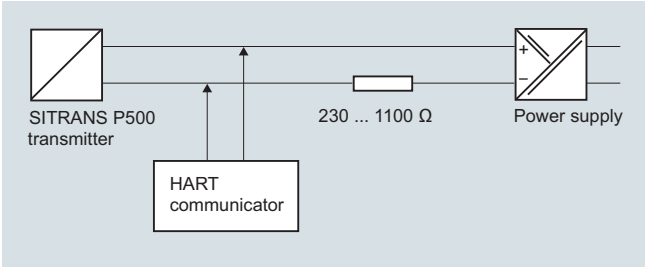
Configuration using the pushbuttons (local operation)

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.

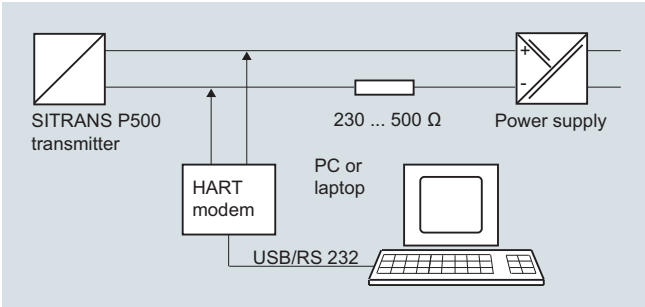
Configuration using HART

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

Technical specifications

Input		
Measured variable	Differential pressure and flow	
Measuring span (infinitely adjustable)	Measuring span (min. ... max.)	Maximum operating pressure (static pressure)
	1.00 ... 50 mbar (0.4 ... 20 inH_2O)	160 bar (2320 psi)
	1.25 ... 250 mbar (0.5 ... 100 inH_2O)	
	6.25 ... 1250 mbar (2.5 ... 502 inH_2O)	
	31.25 ... 6250 mbar (12.54 ... 2509 inH_2O)	
	0.16 ... 32 bar (2.33 ... 465 psi)	
Lower range limit		
• Measuring cell with silicone oil filling	-100 % of max. measuring span and/or 30 mbar a (0.44 psi a)	
Upper range limit	100 % of max. measuring span	
Lower range value	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:: • Bottom: 3.55 … 3.7 mA (default value: 3.6 mA) • Top: 21.0 … 23 mA (default value: 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 • Lower range value 0 bar • Stainless steel seal diaphragm • Measuring cell with silicone oil filling • Room temperature (25 °C (77 °F))	
All error information always refers to the set measuring span.		
Error in measurement at limit setting incl. hysteresis and reproducibility		
r: measuring span ratio (r: measuring span ratio (r = max. measuring span / set span))		
Linear characteristic	r ≤ 10	r ≥ 10
• 50 mbar (20 inH_2O)	≤ 0.06 %	≤ (0.006 · r) %
• 250 mbar (100 inH_2O) 1250 mbar (502 inH_2O) 6250 mbar (2509 inH_2O) 32 bar (465 psi)	≤ 0.03 %	≤ (0.003 · r) %
Square-rooted characteristic		
• Flow > 50 %	r ≤ 10	r ≥ 10
- 50 mbar (20 inH_2O)	≤ 0.06 %	≤ (0.006· r) %
- 250 mbar (100 inH_2O) 1250 mbar (502 inH_2O) 6250 mbar (2509 inH_2O) 32 bar (465 psi)	≤ 0.03 %	≤ (0.003 · r) %
• Flow 25 % … 50 %	r ≤ 10	r ≥ 10
- 50 mbar (20 inH_2O)	≤ 0.12 %	≤ (0.012 · r) %
- 250 mbar (100 inH_2O) 1250 mbar (502 inH_2O) 6250 mbar (2509 inH_2O) 32 bar (465 psi)	≤ 0.06 %	≤ (0.006 · r) %
Influence of ambient temperature per 28 °C (50 °F)		
• 50 mbar (20 inH_2O)	≤ (0.04 · r + 0.05) %	
• 250 mbar (100 inH_2O)	≤ (0.025 · r + 0.014) %	
• 1250 mbar (502 inH_2O) 6250 mbar (2509 inH_2O) 32 bar (465 psi)	≤ (0.006 · r + 0.03) %	
Influence of static pressure		
• At the lower range value (PKN)		
- 50 mbar (20 inH_2O)	≤ (0.1 · r) % per 70 bar (1015 psi) correction via zero point correction	
- 250 mbar (100 inH_2O)	≤ (0.035 · r) % per 70 bar (1015 psi) correction via zero point correction	
- 1250 mbar (502 inH_2O) 6250 mbar (2509 inH_2O) 32 bar (465 psi)	≤ (0.007 · r) % per 70 bar (1015 psi) correction via zero point correction	
• On the measuring span (PKS)		
- 50 mbar (20 inH_2O)	≤ 0.13 % per 70 bar (1015 psi)	
- 250 mbar (100 inH_2O) 1250 mbar (502 inH_2O)	≤ 0.03 % per 70 bar (1015 psi)	
- 6250 mbar (2509 inH_2O)	≤ 0.09 % per 70 bar (1015 psi)	
- 32 bar (465 psi)	≤ 0.05 % per 70 bar (1015 psi)	

Total Performance[1)]		
• Linear characteristic	r ≤ 5	5 < r ≤ 10
- 50 mbar (20 inH_2O)	≤ 0.27 %	≤ 0.46 %
- 250 mbar (100 inH_2O)	≤ 0.14 %	≤ 0.27 %
- 1250 mbar (502 inH_2O) 6250 mbar (2509 inH_2O) 32 bar (465 psi)	≤ 0.09 %	≤ 0.14 %
Square rooted characteristic		
• Flow > 50 %	r ≤ 5	5 < r ≤ 10
- 50 mbar (20 inH_2O)	≤ 0.27 %	≤ 0.46 %
- 250 mbar (100 inH_2O)	≤ 0.14 %	≤ 0.27 %
- 1250 mbar (502 inH_2O) 6250 mbar (2509 inH_2O) 32 bar (465 psi)	≤ 0.09 %	≤ 0.14 %
• Flow 25 % … 50 %	r ≤ 5	5 < r ≤ 10
- 50 mbar (20 inH_2O)	≤ 0.54 %	≤ 0.92 %
- 250 mbar (100 inH_2O)	≤ 0.28 %	≤ 0.54 %
- 1250 mbar (502 inH_2O) 6250 mbar (2509 inH_2O) 32 bar (465 psi)	≤ 0.18 %	≤ 0.28 %
Step response time T_{63} without electrical damping		
• 50 mbar (20 inH_2O)	≤ 140 ms, contains a dead time of ≤ 45 ms	
• 250 mbar (100 inH_2O) 1250 mbar (502 inH_2O) 6250 mbar (2509 inH_2O) 32 bar (465 psi)	≤ 88 ms, contains a dead time of ≤ 45 ms	
Long-term stability	≤ (0.05 · r) % per 5 years ≤ (0.08 · r) % per 10 years	
Influence of power supply	≤ 0.005 %/1 V	
Operating 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 IEC 61326 and NAMUR NE 21	
Permissible pressures	According to 2014/68/EU 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, Hastelloy C276, Monel 400
• Process connection and sealing screw	PN 160: stainless steel, mat.-No. 1.4404/316L
• Sealing material in the process connections	
- O-Ring	• Standard: Viton (FKM (FPM)) • Optional: NBR, PTFE (virginal), PTFE (glass fiber-reinforced), FFPM (Kalrez)[2)], Graphite
Material of parts not in contact with media	
Die-cast aluminum enclosure	• 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)
Stainless steel precision cast enclosure	Stainless steel, 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/DIN EN 61518
Electrical connection	• Screw terminals • Cable entry via the following screwed glands: - M20 x 1.5 - ½-14 NPT - Device plug Han 7D/Han 8D - Device plug M12
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 2014/68/EU	
• PN 160 (MAWP 2320 psi)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Explosion protection	
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 db ia IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6
- Connection	To circuits with values: U_m = DC 10.5 ... 45 V
• Dust explosion protection for zone 20	BVS 09 ATEX E 027
- Marking	Ex II 1 D Ex ta ia IIIC T120°C Da
- 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 2D Ex tb ia IIIC T120°C Db
- 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,
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) The total performance includes the errors caused by temperature effects, static pressure effects and conformity error, including hysteresis and repeatability.
2) Not in combination wiht measuring span "G".

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

for differential pressure and flow

Selection and Ordering data

Article No.

Pressure transmitters for differential pressure and flow, SITRANS P500 HART, PN 160 (MAWP 2320 psi) ↗ **7MF54 ■■ - ■■■■ 0**

↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Enclosure	**Thread for cable gland**[1]	
Die-cast aluminum, dual chamber enclosure	M20x1.5	0
Die-cast aluminum, dual chamber enclosure	½-14 NPT	1
Stainless steel precision casting, dual chamber enclosure	M20x1.5	2
Stainless steel precision casting, dual chamber enclosure	½-14 NPT	3
Output		
4 ... 20 mA, HART		3
Measuring cell filling	**Measuring cell cleaning**	
Silicone oil	normal	1
Measuring span		
1.00 ... 50 mbar	(0.4 ... 20 inH_2O)	C
1.25 ... 250 mbar	(0.5 ... 100.4 inH_2O)	D
6.25 ... 1250 mbar	(2.5 ... 502 inH_2O)	E
31.25 ... 6250 mbar	(12.54 ... 2509 inH_2O)	F
0.16 ... 32 bar	(2.33 ... 465 psi)	G
Wetted parts materials		
Seal diaphragm	Process flange	
Stainless steel 1.4404/316L	Stainless steel 1.4404/316L	A
Hastelloy C276[2]	Stainless steel 1.4404/316L	B
Monel 400[2]	Stainless steel 1.4404/316L	C
Hastelloy	Hastelloy	R
Process connection		
Female thread ¼-18 NPT		
• Sealing screw opposite process connection		
- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518		0
- Mounting thread M10 to DIN 19213		1
• Vent on side of process flange[3]		
- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518		4
- Mounting thread M10 to DIN 19213		5

[1] Cable glands must be ordered separately from "Further designs" (add "-Z" to Article No. and specify order code).
[2] Not together with Measuring span "C".
[2] Not in conjunction with remote seals (option V00).

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Article No. and specify Order code.	
Attachments	
Mounting bracket made of steel	**A01**
Mounting bracket made of stainless steel 304	**A02**
Mounting bracket made of stainless steel 316L	**A03**
Display (Standard: no display, cover closed)	
With display and blanking cover	**A10**
With display and glass cover	**A11**
Special enclosure / cover version	
Two coats of lacquer on enclosure, 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**
Device plug M12 without cable socket (IP66/67)[4]	**A60**
Device plug M12 complete with cable socket (IP66/67)[4]	**A61**
Device plug Han 7D, plastic, straight (with cable socket) (IP65)[4]	**A71**
Device plug Han 7D, plastic, angled (with cable socket) (IP65)[4]	**A72**
Device plug Han 7D, metal enclosure, straight (with cable socket) (IP65)[4]	**A73**
Device plug Han 7D, metal enclosure, angled (with cable socket) (IP65)[4]	**A74**
Device plug Han 8D, plastic, straight (with cable socket) (IP65)[4][7]	**A75**
Device plug Han 8D, plastic, angled (with cable socket) (IP65)[4][7]	**A76**
Device plug Han 8D, metal enclosure, straight (with cable socket) (IP65)[4][7]	**A77**
Device plug Han 8D, metal enclosure, angled (with cable socket) (IP65)[4][7]	**A78**
PG 13.5 adapters[4]	**A82**
Language for labels, quick-start guide, 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 test certificate, 5-point factory calibration (IEC 60770-2)[2]	**C11**
Inspection certificate according to EN 10204-3.1[3]	**C12**
Inspection certificate (EN 10204-3.1); PMI test of parts in contact with medium	**C15**
Functional Safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C20**

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Article 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) Ex tb	**E60**
Use in Zone 20/21/22 (Ex iaD) (ATEX) Ex ta	**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	
Ex-protection Ex ia according to EAC Ex (Russia)	**E80**
Ex-protection Ex d according to EAC Ex (Russia)	**E81**
Dual Seal approval[5]	**E85**
Export approval Korea	**E86**
Special process connection versions (diff. pressure)	
Side vents for gas measurements[9]	**L32**
Swap process connection: high-pressure side at front	**L33**
Mosquito protection	
4 pcs. for ¼-18 NPT thread	**L36**
Process flanges, O-rings, special material **Standard: Viton (FKM (FPM)**	
Process connection sealing rings made of FFPM (Kalrez)[10]	**L62**
Process connection sealing rings made of NBR	**L63**
Process connection sealing rings made of graphite	**L64**
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] (For premounted valve manifolds see page 1/321)	**V00**

[1] Enclosed in print or as DVD: see page 1/319.

[2] When also ordering the quality test 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 inspection 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 footnote 2). Remote seals see page 1/401.

[7] The device plug Han 8D 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.

[9] Only in conjunction with process connection "Vent on side".

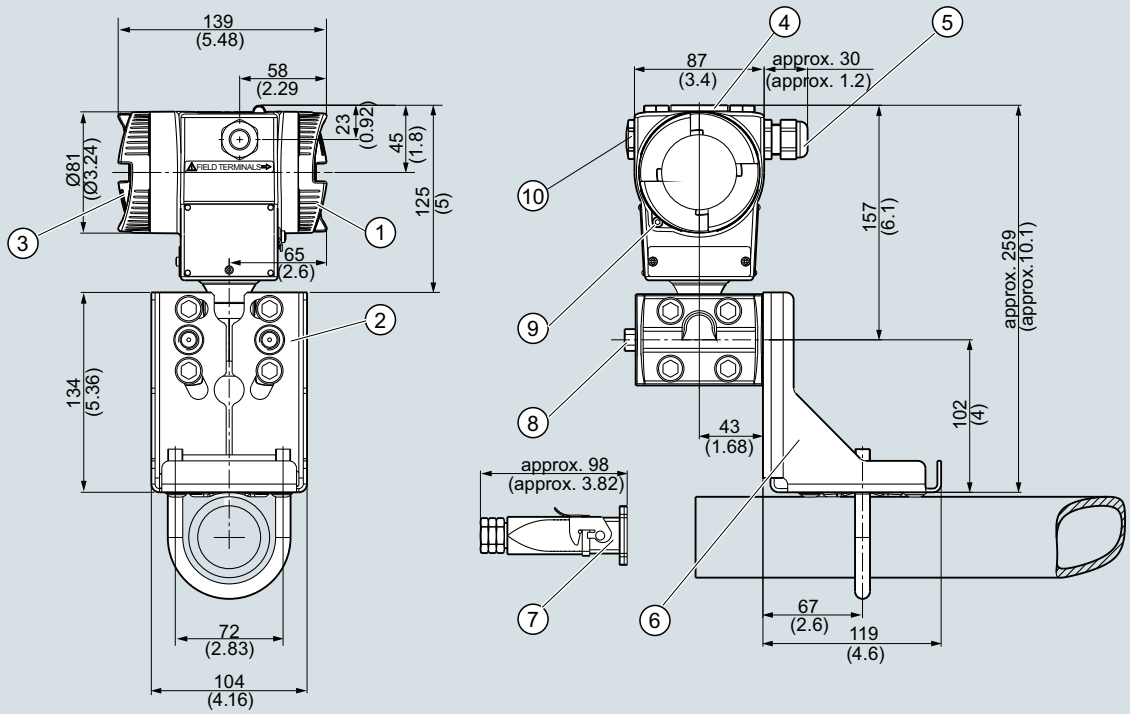
[10] Not together with measuring span "G".

for differential pressure and flow

Selection and Ordering data	Order code
Additional data Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Measuring range to be set Specify in plain text:	
• In the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi	**Y01**
• 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 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	**Y21**
Setting of pressure indication in non-pressure units[1)] Specify in plain text: Y22: ... up to ... l/min, m^3/h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	**Y22 +** **Y01 or Y02**
Customer-specific settings	
Damping setting (range: 0 ... 100 s) (Standard setting: 2 s)	**Y30**

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

Dimensional drawings



1. Connection side[1)]
2. Process connection: ¼-18 NPT (IEC 61518)
3. Electronics side, local display[1)]
4. Cover over buttons
5. Electrical connection:
   - M20 x 1,5 or ½-14 NPT screw gland
   - Han 7D/Han 8D[2) 3)] or M12[3)] device plug
6. Mounting bracket (optional)
7. Electrical connection:
   - Han 7D/Han 8D device plug[2) 3)]
8. Process connection, with valve (optional) or screwed joint (optional)
9. Screw lid - safety bracket
10. Screw-type blank cap

1) In addition, allow approx. 20 mm (0.79 inch) for the thread length
2) Not with "flameproof enclosure" type of protection
3) Not with type of protection "FM + CSA" [is + XP]"

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

Technical specifications

Input		
Measured variable	Level	
Measuring span (infinitely adjustable)	Measuring span (min. ... max.)	Maximum operating pressure
	1.25 ... 250 mbar (0.5 … 100 inH_2O)	See "Mounting flange"
	6.25 ... 1250 mbar (2.5 ... 500 inH_2O)	
	31.25 ... 6250 mbar (12.54 ... 2509 inH_2O)	
Lower range limit		
• Measuring cell with silicone oil filling	-100 % of max. measuring span or 500 mbar a (7.25 psi a) vacuum resistance Also available as vacuum-resistant remote seal: 30 mbar a (0.44 psi a)	
Upper range limit	100% of max. measuring span	
Lower range value	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) All error information always refers to the set measuring span.	• Rising characteristic curve • Lower range value 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: measuring span ratio (r = max. measuring span / set measuring span)		
Linear characteristic	r ≤ 10	r ≥ 10
• 250 mbar (100 inH_2O) 1250 mbar (502 inH_2O) 6250 mbar (2509 inH_2O)	≤ 0.03 %	≤ (0.003 · r) %
Long-term stability	≤ (0.05 · r) % per 5 years ≤ (0.08 · r) % per 10 years	
Influence of ambient temperature per 28 °C (50 °F)[1]		
• 250 mbar (100 inH_2O)	≤ (0.025 · r + 0.014) %	
• 1250 mbar (502 inH_2O) 6250 mbar (2509 inH_2O)	≤ (0.006 · r + 0.03) %	
Influence of static pressure		
• At the lower range value (PKN)[1] [2]		
- 250 mbar (100 inH_2O)	≤ (0.035 · r) % je 70 bar (1015 psi) correction via zero point correction	
- 1250 mbar (502 inH_2O) 6250 mbar (2509 inH_2O)	≤ (0.007 · r) % je 70 bar (1015 psi) correction via zero point correction	
• On the measuring span (PKS)[1]		
- 250 mbar (100 inH_2O) 1250 mbar (502 inH_2O)	≤ 0.03 % je 70 bar (1015 psi)	
- 6250 mbar (2509 inH_2O)	≤ 0.09 % je 70 bar (1015 psi)	
Influence of power supply	≤ 0.005 %/1 V	
Operating 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 IEC 61326 and NAMUR NE 21	
Permissible pressures	According to 2014/68/EU pressure equipment directive	
Medium temperature of high-pressure side		
• Measuring cell with silicone oil filling		
- $p_{abs} \geq 1$ bar	-40 ... +175[3] °C (-40 ... +347[3] °F)	
- $p_{abs} < 1$ bar	-40 ... +80 °C (-40 ... +176 °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 wetted parts at the high-pressure side	
• Seal diaphragm of mounting flange	Stainless steel 1.4404/316L, Hastelloy C276, mat. no. 2.4819, Monel 400, mat. no. 2.4360, Tantal, PFA auf Edelstahl 1.4404/316L, PTFE auf Edelstahl 1.4404/316L
• Sealing surface	Smooth to EN 1092-1, Form B1 and/or ASME B16.5 RF 125 … 250 AA for stainless steel316L, EN 1092-1 Form B2 and/or ASME B16.5 RFSF in the case of other materials
• Sealing material in the process connection	
- O-Ring	• Standard: Viton (FKM (FPM)) • Optional: NBR, PTFE (virginal), PTFE (glas fiber-reinforced), FFPM (Kalrez), Graphite
- For vacuum application of mounting flange	Copper
Material of wetted parts at the low-pressure side	
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Hastelloy C276, Monel 400
• Process connection and sealing screw	• Stainless steel, mat. no. 1.4404/316L
• Sealing material in the process connection	
- O-Ring	• Standard: Viton (FKM (FPM)) • Optional: NBR, PTFE (virginal), PTFE (glas fiber-reinforced), FFPM (Kalrez), Graphite
Material of parts not in contact with media	
Die-cast aluminum enclosure	• 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
Stainless steel precision cast enclosure	Stainless steel, mat. no. 1.4404/316L
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/DIN EN 61518
Electrical connection	• Screw terminals • Cable entry via the following screwed glands: - M20 x 1.5 - ½-14 NPT - Device plug Han 7D/Han 8D - Device plug M12
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 2014/68/EU	
• PN 160 (MAWP 2320 psi)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Explosion protection	
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 db ia IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6
- Connection	To circuits with values: U_m = DC 10.5 ... 45 V
• Dust explosion protection for zone 20	BVS 09 ATEX E 027
- Marking	Ex II 1 D Ex ta ia IIIC T120°C Da
- 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 tb ia IIIC T120°C Db
- 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 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) 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.
3) This value may be increased if the process connection is sufficiently insulated.

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		Article No.	Order code
Pressure transmitters for level, SITRANS P500 HART		↗ 7MF56 - 0 -	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Enclosure	**Thread for cable gland[9)]**		
Die-cast aluminum, dual chamber enclosure	M20x1.5	0	
Die-cast aluminum, dual chamber enclosure	½-14 NPT	1	
Stainless steel precision casting, dual chamber enclosure	M20x1.5	2	
Stainless steel precision casting, dual chamber enclosure	½-14 NPT	3	
Output			
4 ... 20 mA, HART		3	
Measuring cell filling	**Measuring cell cleaning**		
Silicone oil	normal	1	
Measuring span (min. ... max.)			
1.25 ... 250 mbar	(0.5 ... 100 inH_2O)	D	
6.25 ... 1250 mbar	(2.5 ... 500 inH_2O)	E	
31.25 ... 6250 mbar	(12.54 ... 2509 inH_2O)	F	
Wetted parts of the low-pressure side (stainless steel process flanges)			
Seal diaphragm	Process connection		
Stainless steel 1.4404/316L	Stainless steel 1.4404/316L	A	
Hastelloy C276	Stainless steel 1.4404/316L	B	
Monel 400	Stainless steel 1.4404/316L	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/DIN EN 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/DIN EN 61518		4	
- Mounting thread M10 to DIN 19213		5	
Wetted parts materials (high-pressure side)			
Stainless steel 1.4404/316L		0	
Hastelloy C276 mat. no. 2.4819		1	
Monel 400 mat. no. 2.4360		2	
Tantalum		3	
PFA coated on stainless steel		4	
PTFE on stainless steel 1.4404/316L (not in combination with an extension)		6 A	
Other version Add Order code and plain text: Material: ... ; Extension length: ...		9 Y	N 1 Y
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	Q 1 Y

for level

Selection and Ordering data	Article No.	Order code
Pressure transmitters for level, SITRANS P500 HART	**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**	
Other version, add Order code and plain text: Filling liquid: ...	**9**	**R1Y**

Selection and Ordering data	Order code
Further designs Add "**-Z**" to Article 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/enclosure	
Two coats of lacquer on enclosure, 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**
Device plug M12 without cable socket (IP66/67)[4]	**A60**
Device plug M12, cable socket (IP66/67)[4]	**A61**
Device plug Han 7D, plastic, straight (with cable socket) (IP65)[4]	**A71**
Device plug Han 7D, plastic, angled (with cable socket) (IP65)[4]	**A72**
Device plug Han 7D, metal enclosure, straight (with cable socket) (IP65)[4]	**A73**
Device plug Han 7D, metal enclosure, angled (with cable socket) (IP65)[4]	**A74**
Device plug Han 8D, plastic, straight (with cable socket) (IP65)[4][7]	**A75**
Device plug Han 8D, plastic, angled (with cable socket) (IP65)[4][7]	**A76**
Device plug Han 8D, metal enclosure, straight (with cable socket) (IP65)[4][7]	**A77**
Device plug Han 8D, metal enclosure, angled (with cable socket) (IP65)[4][7]	**A78**
PG 13.5 adapters[4]	**A82**
Language for labels, quick-start guide 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 test certificate, 5-point factory calibration (IEC 60770-2)[2]	**C11**
Inspection certificate according to EN 10204-3.1[3]	**C12**
Inspection certificate (EN 10204-3.1); PMI test of parts in contact with medium	**C15**
Functional Safety (SIL2) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	**C20**
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 Article 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) Ex tb	**E60**
Use in Zone 20/21/22 (Ex iaD) (ATEX) Ex ta	**E61**
Use in Zone (Ex DIP) (ATEX) (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	
Ex-protection Ex ia according to EAC Ex (Russia)	**E80**
Ex-protection Ex d according to EAC Ex (Russia)	**E81**
Dual Seal approval[5]	**E85**
Export approval Korea	**E86**
Special process connection versions (diff. pressure)	
Swap process connection: high-pressure side at front	**L33**
Mosquito protection	
4 pcs. for ¼-18 NPT thread	**L36**
Process flanges, O-rings, special material **Standard: Viton (FKM (FPM)**	
Process connection sealing rings made of FFPM (Kalrez)	**L62**
Process connection sealing rings made of NBR	**L63**
Process connection sealing rings made of graphite	**L64**
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 DVD: see page 1/319.

2) When also ordering the quality test 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 inspection 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 device plug Han 8D is identical with the former Han 8U versio.

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

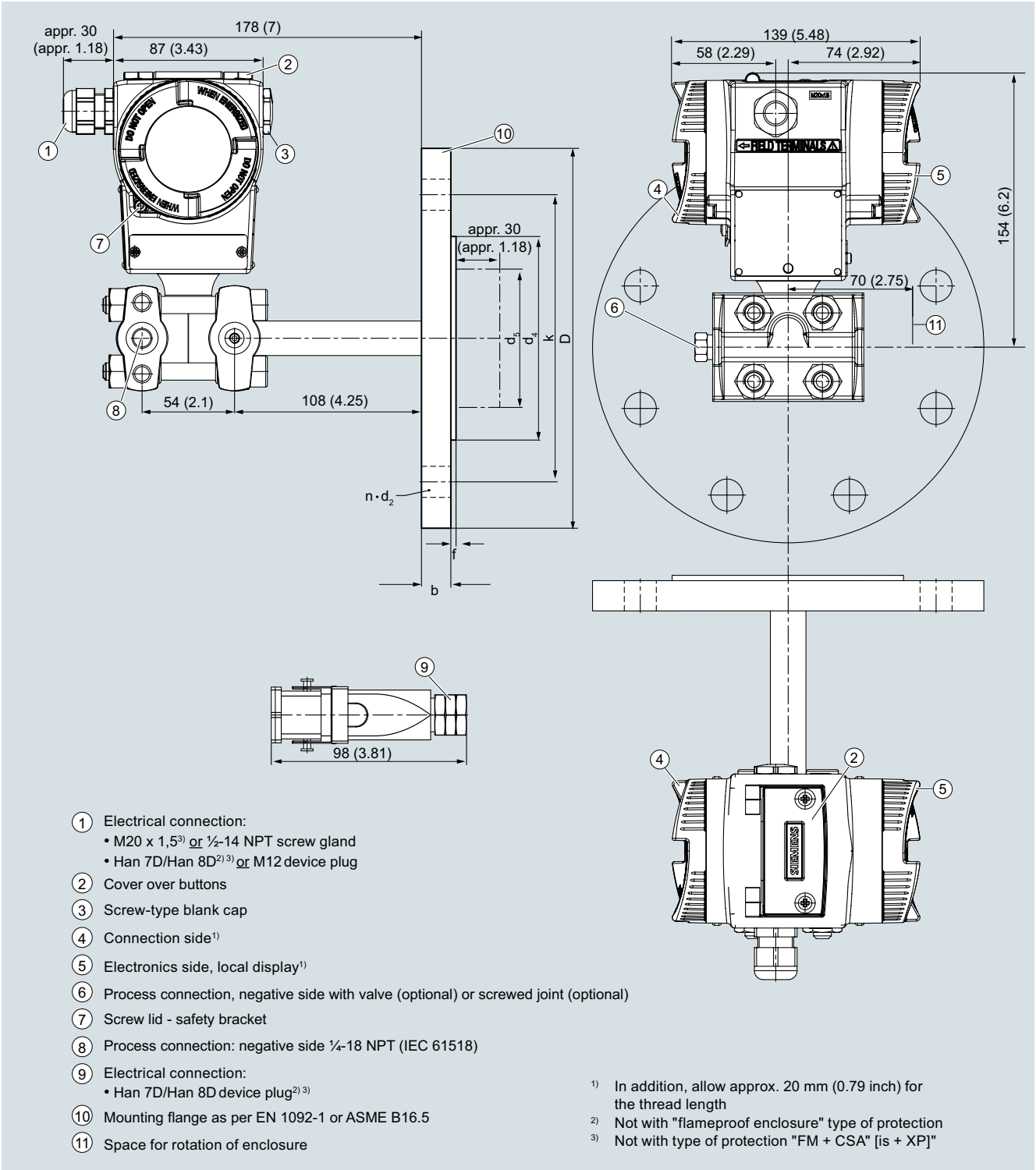
9) Cable glands must be ordered separately from "Further designs" (add "-Z" to Article No. and specify order code).

for level

Selection and ordering data	Order code
Additional data Please add "**-Z**" to Article No. and specify Order code(s) and plain text.	
Measuring range to be set Specify in plain text:	
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 Specify in plain text (standard setting: mbar) Y21: bar, kPa, MPa, psi, ...	**Y21**
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[1)] Specify in plain text: Y22: ... up to ... l/min, m^3/h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	**Y22 +** **Y01**
Customer-specific settings	
Damping setting (range: 0 ... 100 s) (Standard setting: 2 s)	**Y30**

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

Dimensional drawings



1. Electrical connection:
   - M20 x 1,5[3] or ½-14 NPT screw gland
   - Han 7D/Han 8D[2] [3] or M12 device plug
2. Cover over buttons
3. Screw-type blank cap
4. Connection side[1]
5. Electronics side, local display[1]
6. Process connection, negative side with valve (optional) or screwed joint (optional)
7. Screw lid - safety bracket
8. Process connection: negative side ¼-18 NPT (IEC 61518)
9. Electrical connection:
   - Han 7D/Han 8D device plug[2] [3]
10. Mounting flange as per EN 1092-1 or ASME B16.5
11. Space for rotation of enclosure

[1] In addition, allow approx. 20 mm (0.79 inch) for the thread length
[2] Not with "flameproof enclosure" type of protection
[3] Not with type of protection "FM + CSA" [is + XP]"

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

for level

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	45[1)]	2	125	4	0, 50, 100, 150 or 200
DN 80	PN 40	24	200	90	18	138	76	72[2)]	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)	1.77 (45)[1)]	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)	1.77 (45)[1)]	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 (72)[2)]	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 (72)[2)]	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) 59 mm = 2.32 inch with tube length L=0.

2) 89 mm = 3½ inch with tube length L=0.

Selection and Ordering data

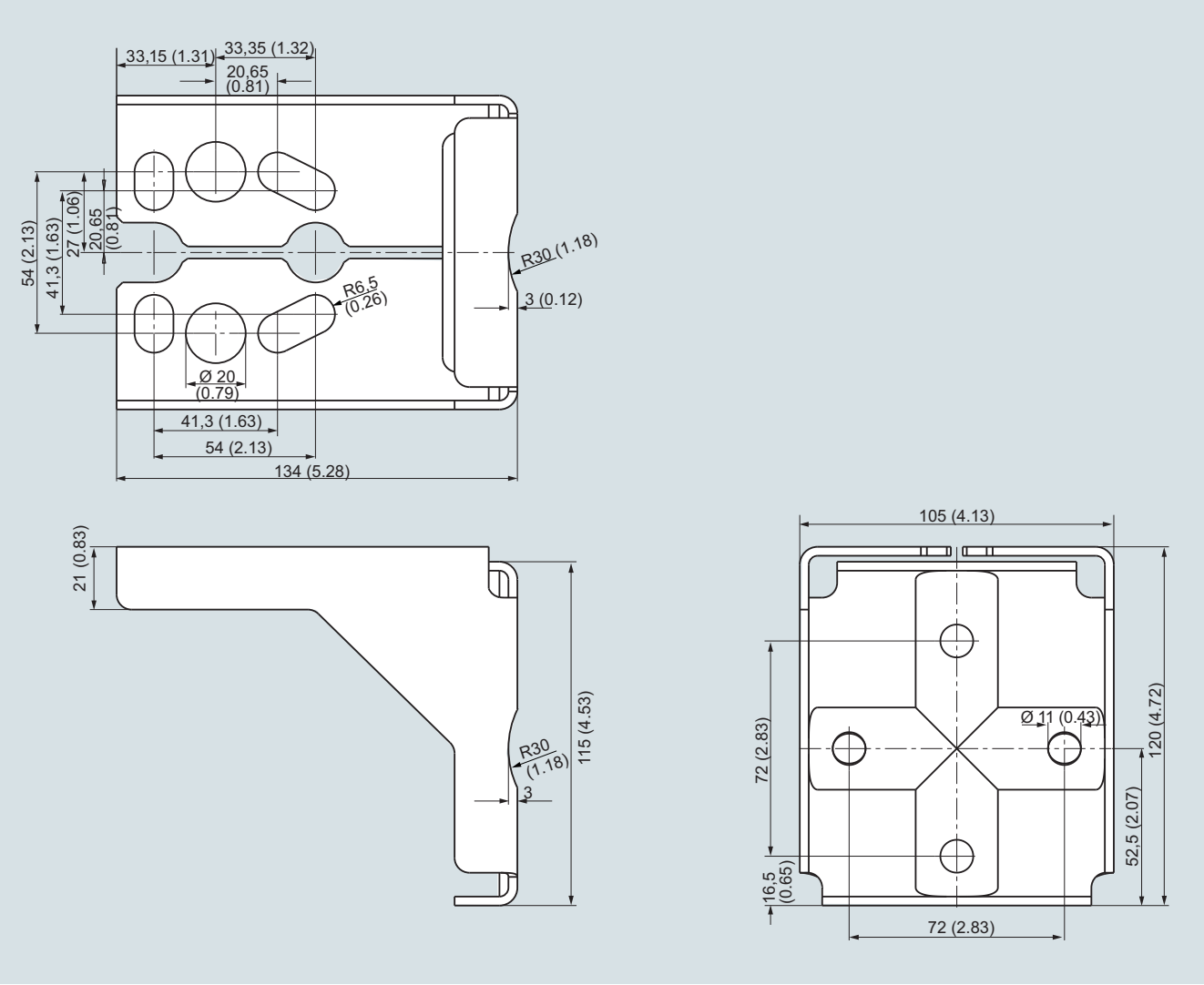
	Article No.
Mounting brackets	
For differential pressure transmitters with flange thread M10 (7MF54..-…10 and 7MF54..-…50)	
• Made of steel	**7MF5987-1AA**
• Made of stainless steel	**7MF5987-1AD**
Mounting brackets	
for differential pressure transmitter with flange thread 7/16-20 UNF (7MF54..-…00 and 7MF54..-…40)	
• Made of steel	**7MF5987-1AC**
• Made of stainless steel	**7MF5987-1AF**
Cover	
Made of die-cast aluminum, including O-ring	
• Without inspection window	**7MF5987-1BE**
• With inspection window	**7MF5987-1BF**
Made of stainless steel, including seal	
Digital indicator Including mounting material	**7MF5987-1BR**
TAG plate (incl. fastening material)	
Without inscription (5 pcs.)	**7MF5987-1CA**
Printed (1 pc.) Data according to Y01 or Y02, Y15 and Y16 (see "SITRANS P transmitters")	**7MF5987-1CB-Z Y..: .....**
Mounting screws	
For TAG plate, grounding and connection terminals and securing and locking screws (30 units)	**7MF5987-1CC**
Sealing plugs for process flange (1 set = 2 units)	
• Made of stainless steel	**7MF4997-1CG**
• Made of Hastelloy	**7MF4997-1CH**
Screw plugs with valve Complete (1 set = 2 parts)	
• Made of stainless steel	**7MF4997-1CP**
• Made of Hastelloy	**7MF4997-1CQ**
Connection board (incl. fastening material)	
HART, intrinsically safe Ex ia for installation in transmitter enclosure (observe warranty conditions)	**7MF5987-1DM**
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/enclosure (10 pcs.)	**7MF4997-2EB**

Selection and Ordering data

	Article No.
Documentation	
The entire documentation is available for download free-of-charge in various languages at: http://www.siemens.com/processinstrumentation/documentation	
Compact operating instructions	
• German, Spanish, French, Italian, Dutch	**A5E02344532**
• Estonian, Latviaan, Lithuanian, Polish, Romanian	**A5E02307339**
• Bulgarian, Czech, Finnish, Slovakian, Slovenian	**A5E02307340**
• Danish, Greek, Portuguese, Swedish, Hungarian	**A5E02307341**
• Russian	**A5E02307338**
HART modem	
With USB interface	**7MF4997-1DB**
Certificates (order only via SAP) additional to internet download	
• Hard copy (to order)	**A5E03252406**
• On DVD (to order)	**A5E03252407**

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

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 valve 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 valve manifolds are sealed with PTFE gaskets between the transmitter and the valve manifold.

Once installed, the complete unit is checked under pressure for leaks (compressed air 6 bar (2411 inH2O)) and is certified leak-proof with a factory certificate to EN 10204 - 2.2.

All valve manifolds should preferably be secured with the corresponding 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 inspection certificate 3.1 to EN 10204 after choosing the option "Factory mounting of valve manifolds", a separate certificate is provided for the transmitter and for the valve manifold.

Selection and ordering Data

Valve manifold 7MF9411-5BA on SITRANS P pressure transmitter P500 for differential pressure and flow

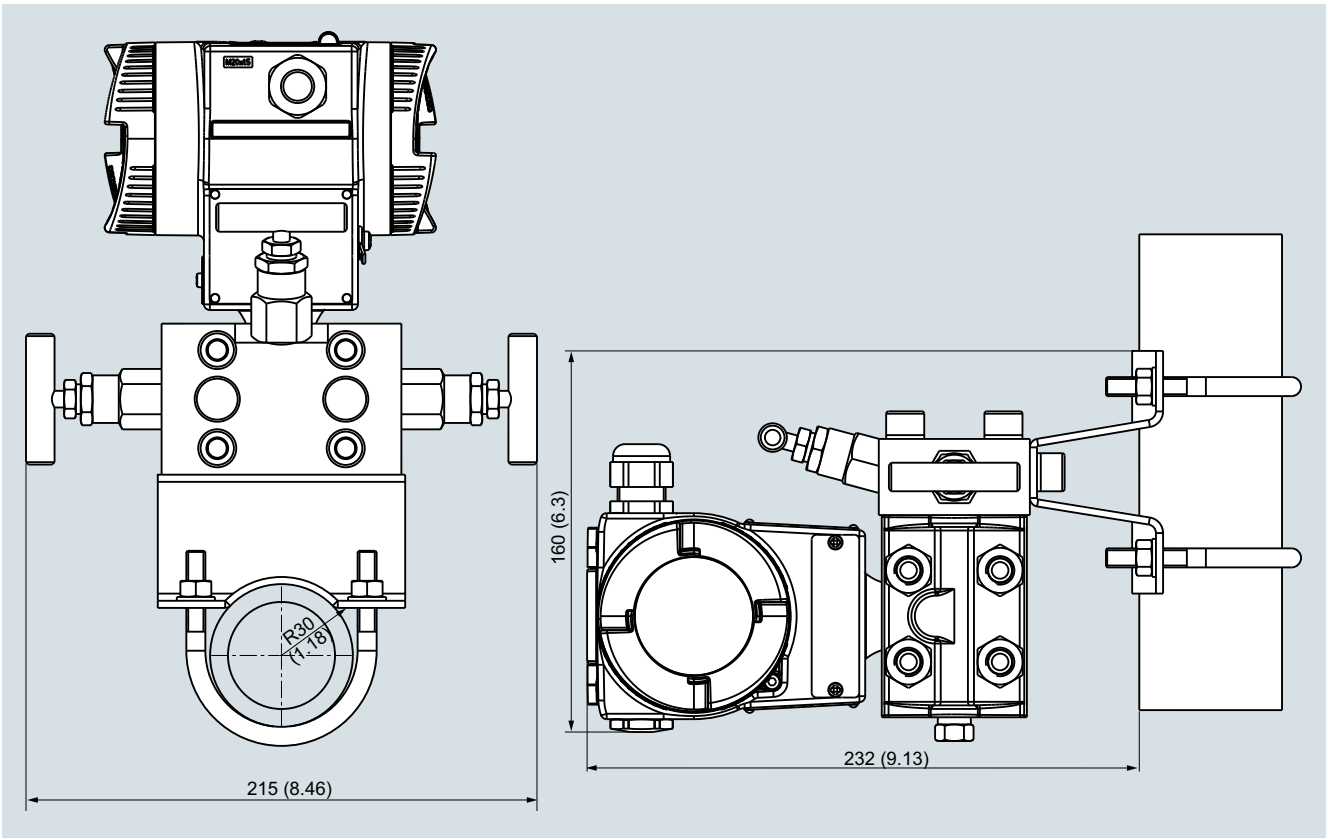
Add -Z to the Article No. of the transmitter and add Order codes	Order code
SITRANS P500 7MF54..-...	
mounted with gaskets made of PTFE and screws made of	
• Chromized steel	**U01**
• Stainless steel	**U02**
Delivery incl. high-pressure test certified by factory certificate to EN 10204-2.2	
Further designs:	
Delivery includes mounting bracket and mounting clips made of	
• Steel	**A01**
• Stainless steel	**A02**
(instead of the mounting bracket supplied with the transmitter)	
Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	**C12**

Valve manifold 7MF9411-5CA on SITRANS P500 pressure transmitter for differential pressure and flow

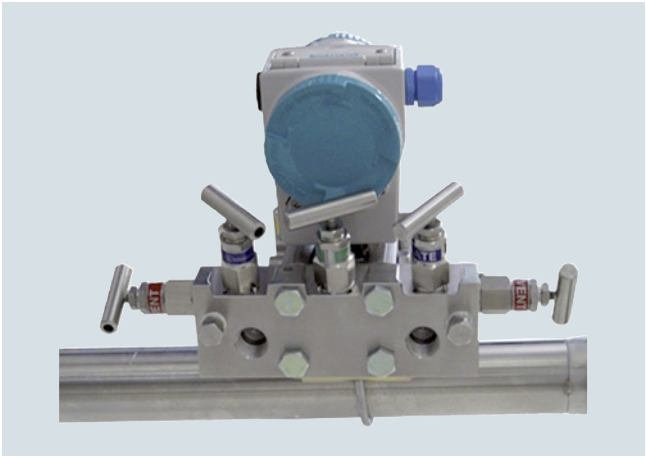
Add -Z to the Article No. of the transmitter and add Order codes	Order code
SITRANS P500 7MF54..-...	
mounted with gaskets made of PTFE and screws made of	
• Chromized steel	**U03**
• Stainless steel	**U04**
Delivery incl. high-pressure test certified by factory certificate to EN 10204-2.2	
Further designs:	
Delivery includes mounting bracket and mounting clips made of	
• Steel	**A01**
• Stainless steel	**A02**
(instead of the mounting bracket supplied with the transmitter)	
Inspection certificate according to EN 10204-3.1 supplied for transmitters and mounted valve manifold	**C12**

Dimensional drawings

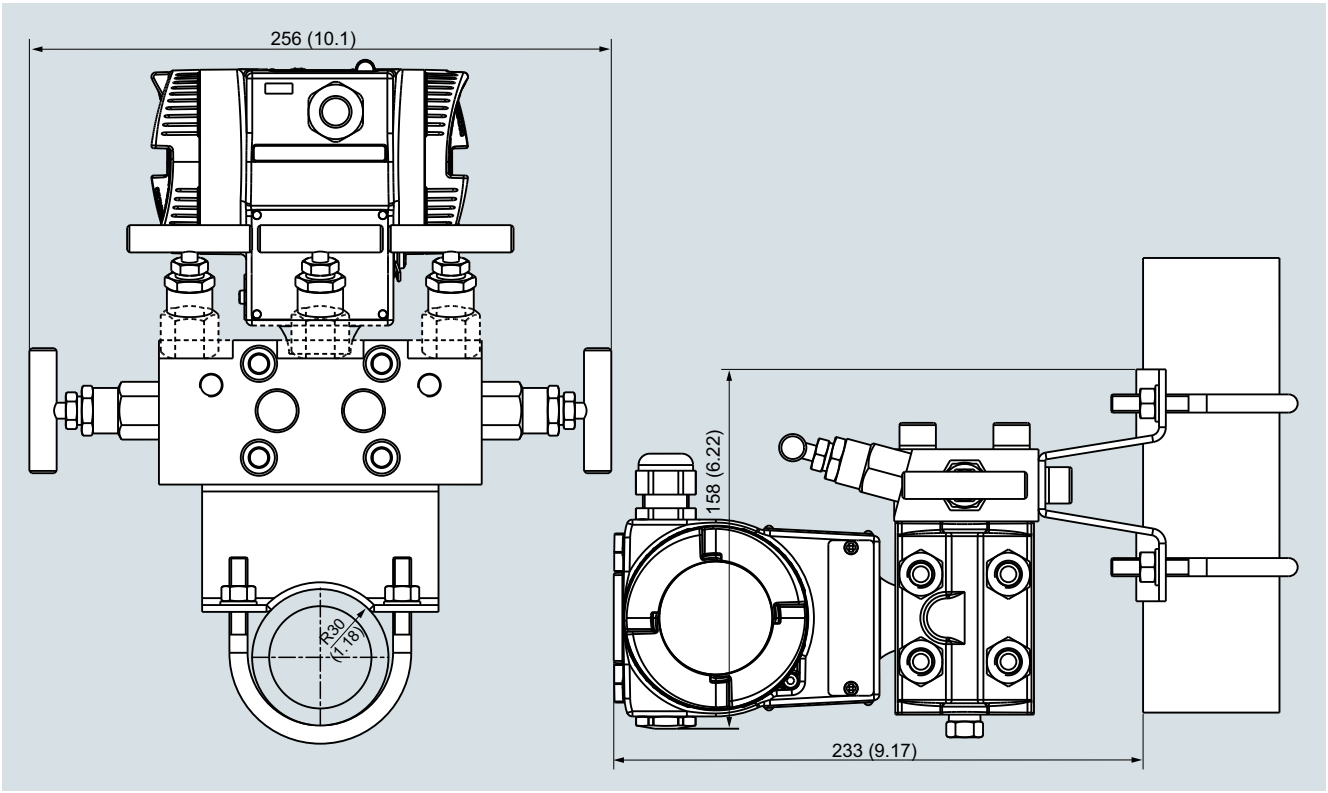
Valve manifold 7MF9411-5BA with attached SITRANS P500 pressure transmitter for differential pressure and flow (incl. mounting bracket)



Valve manifold 7MF9411-5BA with attached SITRANS P500 pressure transmitter for differential pressure and flow, measurements in mm (inch)



Valve manifold 7MF9411-5CA with attached SITRANS P500 pressure transmitter for differential pressure and flow (incl. mounting bracket)



Valve manifold 7MF9411-5CA with attached SITRANS P500 pressure transmitter for differential pressure and flow, measurements in mm (inch)

Technical description

Overview

In many cases the pressure transmitter and the medium have to be physically separated. It is then necessary to use a remote seal.

The remote seals can be used with the SITRANS P320/420 pressure transmitter series:

- Pressure
- Absolute pressure
- Differential pressure and flow

Note

When configuring your remote seal, be sure to read the information about transmission response, temperature error and response time to be found in the sections "Function" and "Technical data". Only then will the remote seal work to optimum effect.

Benefits

- No direct contact between the pressure transmitter and the medium
- Individual configuration of the pressure transmitter for perfect adaptation to the operating conditions
- Available in many versions
- Specially designed for difficult operating conditions
- Quick-release versions available for the food industry

Application

Remote seal systems should be used if a separation between the medium and the measuring instrument is essential or appropriate.

Examples of such cases:

- The temperature of the medium is outside the limits specified for the pressure transmitter.
- The medium is corrosive and requires diaphragm materials which are not available for the pressure transmitter.
- The medium is highly viscous or contains solids which would block the measuring chambers of the pressure transmitter.
- The medium may freeze in the measuring chambers or pulse line.
- The medium is heterogeneous or 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 point, e.g. in a batch process.

Design

A remote seal system consists of the following components.

- Pressure transmitter
- One or two remote seals
- Filling liquid
- Connection between pressure transmitter and remote seal (direct mounting or by means of capillary)

The space for the medium is sealed off with a flat embedded elastic diaphragm. Between the diaphragm and the pressure transmitter is the filling liquid.

In many cases, a capillary must be connected between the remote seal and the pressure transmitter in order, for example, to reduce the temperature effects on the pressure transmitter when the measured medium is hot.

However, the capillary influences the activation time and the temperature response of the overall remote seal system. When capillaries are used to connect a remote seal to a pressure transmitter for differential pressure, two capillaries of equal length must always be used.

Optionally, the remote seal with diaphragm extension (tube) can be ordered.

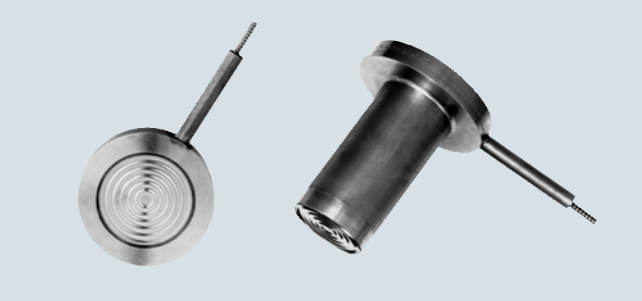
The remote seals in sandwich design are secured with a blank flange.

Designs

Diaphragm seal

With diaphragm seals, the pressure is measured by means of a flat diaphragm which rests in a bed.

The following types of diaphragm seals exist:



Diaphragm seal of sandwich design without (left) and with a projecting diaphragm (tube)

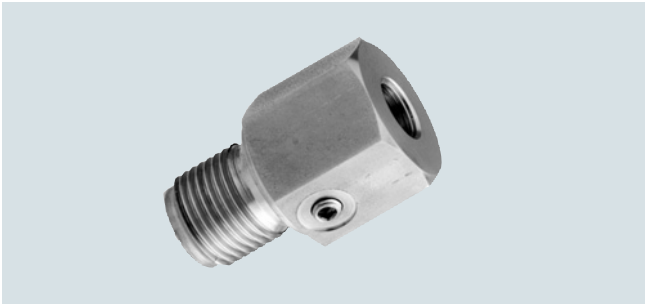
- Sandwich design
- Sandwich design with projecting diaphragm (tube) to DIN or ASME which are secured using a dummy flange.

Diaphragm seal of flange design without (left) and with a projecting diaphragm (tube)

- Flange design
- Flange design with projecting diaphragm (tube) to DIN or ASME, secured using holes in the flange.

Quick-release diaphragm seal

- Quick-release remote seals, e.g. to DIN 11851, SMS standard, IDF standard, APV RJF standard, clamp connection, etc.
- Miniature diaphragm seal with male thread for screwing into tapped holes
- Remote seals with customer-specific process connections

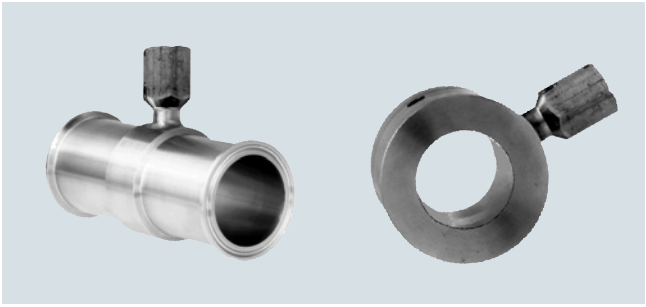


Miniature diaphragm seal with diaphragm flush with front

- Miniature diaphragm seals

The quick-release remote seals are used above all in the food industry. Their design means that the medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismounting is possible for cleaning.

Inline seal



Inline seal with quick-release design (left) and for flange mounting

With inline seals, the pressure is first measured using a cylindrical diaphragm positioned in a pipe, and then transmitted to the pressure transmitter by means of 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. Furthermore, the inline seal can be cleaned by a pig.

The following types of inline seals exist:

- Quick-release inline seals, e.g. to DIN 11851, SMS standard, IDF standard, APV/RJF standard, clamp connection etc. The quick-release facility attached to the remote seal enables the seal to be removed quickly for cleaning purposes.
- Inline seals for flanging to EN or ASME.
- Inline seals with customer-specific process connections.

Note:

The pressure data on the transmitter and the remote seal must be observed with regard to pressure/temperature behavior.

Function

The measured pressure is transferred from the diaphragm to the filling liquid and passes through the capillary to the measuring chamber of the pressure transmitter. The interior of the diaphragm seal and of the capillary, as well as the measuring chamber of the transmitter, are filled gas-free by the filling liquid.

Transmission response

The transmission response of a remote seal is characterized by the following variables:

- Temperature error
- Adjustment time

Temperature error

Temperature errors are caused by the change of volume of the filling liquid due to temperature variations. To select the right remote seal you must calculate the temperature error.

Below you will find an overview of the factors which influence the size of the temperature error, as well as information on how to calculate the temperature error.

The temperature error is dependent on the following variables:

- Rigidity of the diaphragm used
- Filling liquid used
- Influence of the filling liquid underneath the process flanges or in the connection shank of the pressure transmitter
- Internal diameter of the capillary: The bigger the internal diameter, the bigger the temperature error
- Length of the capillary: The longer the capillary, the bigger the temperature error

Diaphragm rigidity

The rigidity of the diaphragm is of decisive importance. The bigger the diameter of the diaphragm, the softer the diaphragm and the more sensitively it reacts to temperature-induced changes in volume of the filling liquid.

The result is that small measuring ranges are only possible with large diaphragm diameters.

Other factors apart from diaphragm rigidity which also play a role:

- Diaphragm thickness
- Diaphragm material
- Coatings if present

Filling liquid

Every filling liquid reacts to temperature variations with a change of volume. Temperature errors can be minimized by selecting a suitable filling liquid, but the filling liquid must also be appropriate for the temperature limits and operating pressure. Furthermore, the filling liquid must also be physiologically harmless.

Since the filling liquid is present under the diaphragm, in the capillary and under the process flange of the pressure transmitter (or in the connection shank), the temperature error must be calculated separately for each combination.

Note:

A vacuum-resistant remote seal is recommended for continuous low-pressure operation at 500 mbar a or below, including during commissioning (see ordering data).

An example of a temperature error calculation can be found in the section "Technical Specifications".

Response time

The response time is dependent on the following factors:

- Internal diameter of the capillary: The bigger the internal diameter, the shorter the response time
- Viscosity of the filling liquid The greater the viscosity, the longer the response time
- Length of the capillary: The longer the capillary, the longer the response time
- Pressure in the pressure measuring system: The higher the pressure, the shorter the response time

Recommendations

The following should be observed to obtain an optimum combination of transmitter and remote seal:

- Choose the biggest possible diameter for the remote seal. The effective diameter of the seal diaphragm is then bigger and the temperature error smaller.
- Choose the shortest possible capillary. The response time is then shorter and the temperature error smaller
- Choose the filling liquid with the least viscosity and the smallest coefficient of expansion. Make sure, however, that the filling liquid meets the process requirements with regard to pressure, vacuum and temperature. And ensure that the filling liquid and the medium are compatible with one another.
- Note the following points for use in the vacuum range:
  - The pressure transmitter must always be positioned below the lowest spigot.
  - The operating range of some filling liquids is very limited with regard to the permissible temperature of the medium.
  - A vacuum-proof seal is necessary for continuous operation in the low-pressure range.
- Recommendations for the minimum measuring span can be found in the section "Technical data".

Note

The remote seals listed here are a selection of the most common designs. On account of the large variety of process connections, certain remote seals which are not listed here may be available nevertheless.

Other versions can be:

- Other process connections, standards
- Aseptic or sterile connections
- Other dimensions
- Other nominal pressures
- Special diaphragm materials, including coatings
- Other sealing faces
- Other filling liquids
- Other capillary lengths
- Sheathing of capillaries with protective hose
- Calibration at higher/lower temperatures etc.

Please contact your local Siemens office for further information.

Negative pressure service

Liquids, such as silicone oils, inert or those suitable for food, are used in remote seal systems for transmission of the process pressure to the pressure transmitter.

In each liquid, particles have the tendency to leave the liquid compound with increasing temperature (transition from liquid to gaseous aggregate state). This means the vapor pressure increases with increasing temperature and is dependent on the substance or mixture being present.

The higher the temperature and the lower the associated process pressure in the liquid, the more difficult it gets to guarantee the desired transmission properties of the fill fluid and therefore the measuring arrangement.

Plus the sealing elements at the transmitter must be designed so that a diffusion of molecules from the atmosphere into the remote seal system is prevented due to the constantly occurring negative pressure.

In addition to the influencing variables process pressure and process temperature, the vapor pressure curve of the fill fluid at the remote seal end and the stiffness of the remote seal membrane impact the functionality of the remote seal in the negative pressure range.

This means you have to pay special attention to the physical properties of fill fluids with applications in the negative pressure range.

There are three stages for the negative pressure resistance:

- **Standard design** of the remote seal without additional protective measures, suitable for the overpressure range and low negative pressure range. This design is identified with (1) in the diagrams below in section 3.
- **Negative pressure service** with suitable seals and treated fill fluid, identified with (2) in the diagrams below in section 3. Here you select the order codes D81 or D83, depending on the mounting type.·
- **Extended negative pressure service** with more extended treatment of the fill fluid and the remote seals, identified in the diagrams below. Here you select the order codes D85 or D88, depending on the mounting type.

There are two more areas in the diagrams. The area (4) identifies an area that has to be clarified with Technical Support prior to placing the order. The area (5) describes the area in which the remote seal fill fluid is permanently destroyed and the entire remote seal is therefore without function.

Technical specifications of the remote seal filling liquids

Filling liquid	Number in the Article No.	Density at 20°C [kg/dm³]	Viscosity at 20°C [mm²/s]	Suitable for negative pressure service	Suitable for extended negative pressure service
Silicone oil M5	1	0.914	4	x	-
Silicone oil M50	2	0.966	50	x	x
High-temperature oil	3	1.070	57	x	x
Halocarbon oil	4	1.968	14	x	-
Food oil (FDA-listed)	7	0.920	10	x	x

The suitable negative pressure service is specified with the pressure/temperature curves of the respective liquids described below.

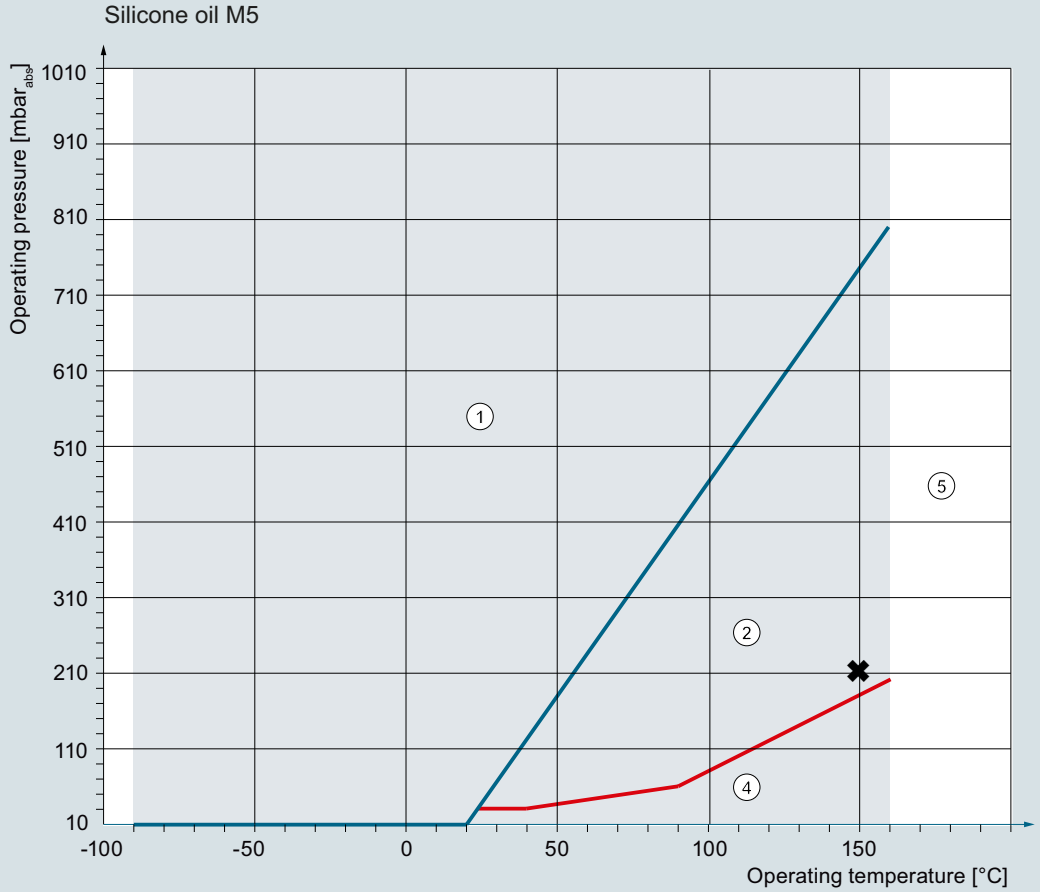
Note: For reasons of operational safety, the transmitter must not exceed the height of the remote seal - with differential pressure applications, the height of the bottom remote seal - for measurements in the negative pressure range. The associated installation types B, C1, C2 or H are described at the end of this section under the topic "Measuring arrangements".

Selection of the required negative pressure service

The procedure for determining the required negative pressure service is described below using the silicone oil M5 as fill fluid. The minimum existing process pressure of a fictitious process is 200 $mbar_{abs}$ (2.9 psi) (at a maximum process temperature of 150 °C (302 °F)). This intersection is identified by an "✖" in the diagram below. This means the negative pressure service D81 or D83 (depending on the application) is sufficient in this example.

The suitable negative pressure resistance is determined this way for all other fill fluids.

Note:
Note the response times according to the table on page 1/336.



(1) Operating range of the standard remote seal design without special measures.

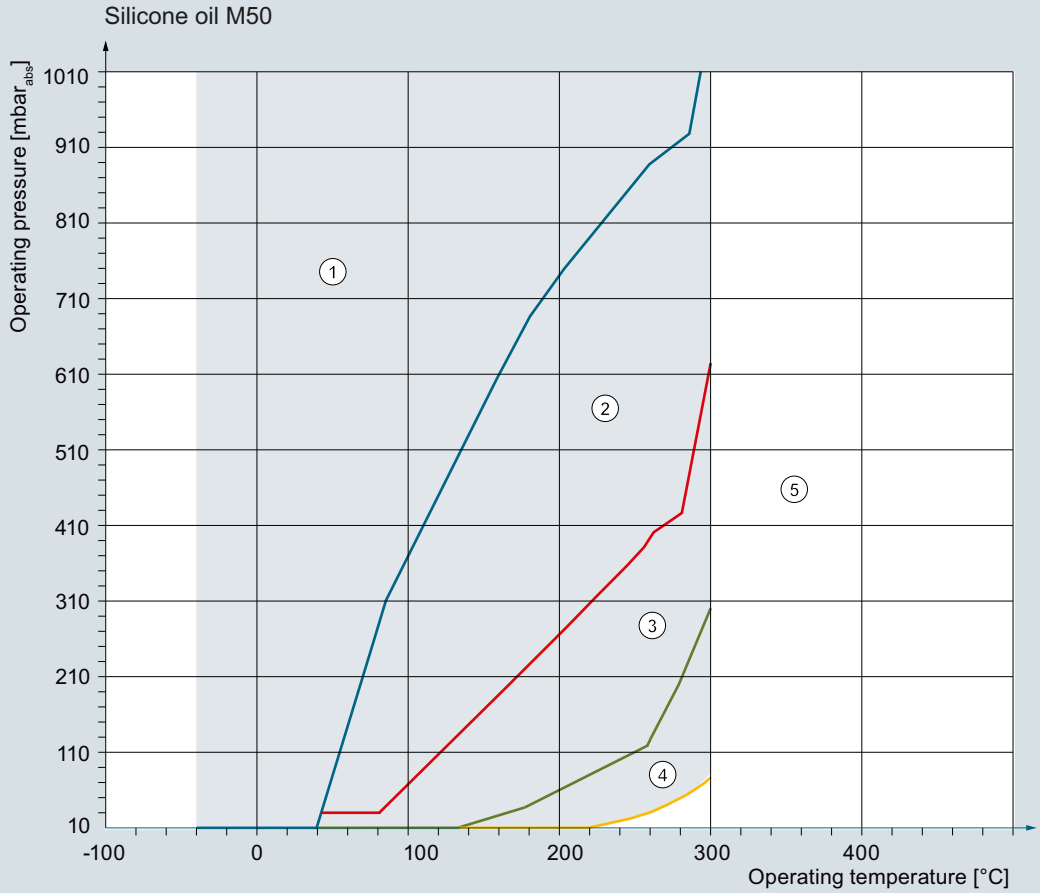
(2) Operating range for which the **negative pressure service D81 or D83** is required.
Note: An extended negative pressure service is **not** possible for this fill fluid.

(4) Please contact Technical Support for applications in this area.
Detailed information regarding application, process and ambient data are necessary.

(5) Area in which you have to expect the destruction of the fill fluid.
A function of the remote seal is not specified here.

Permissible operating range:
Max. temperature limit: 160 °C
Min. temperature limit: -90 °C

Negative pressure applications with silicone oil M5



1 Operating range of the standard remote seal design without special measures.

2 Operating range for which the **negative pressure service D81 or D83** is required.

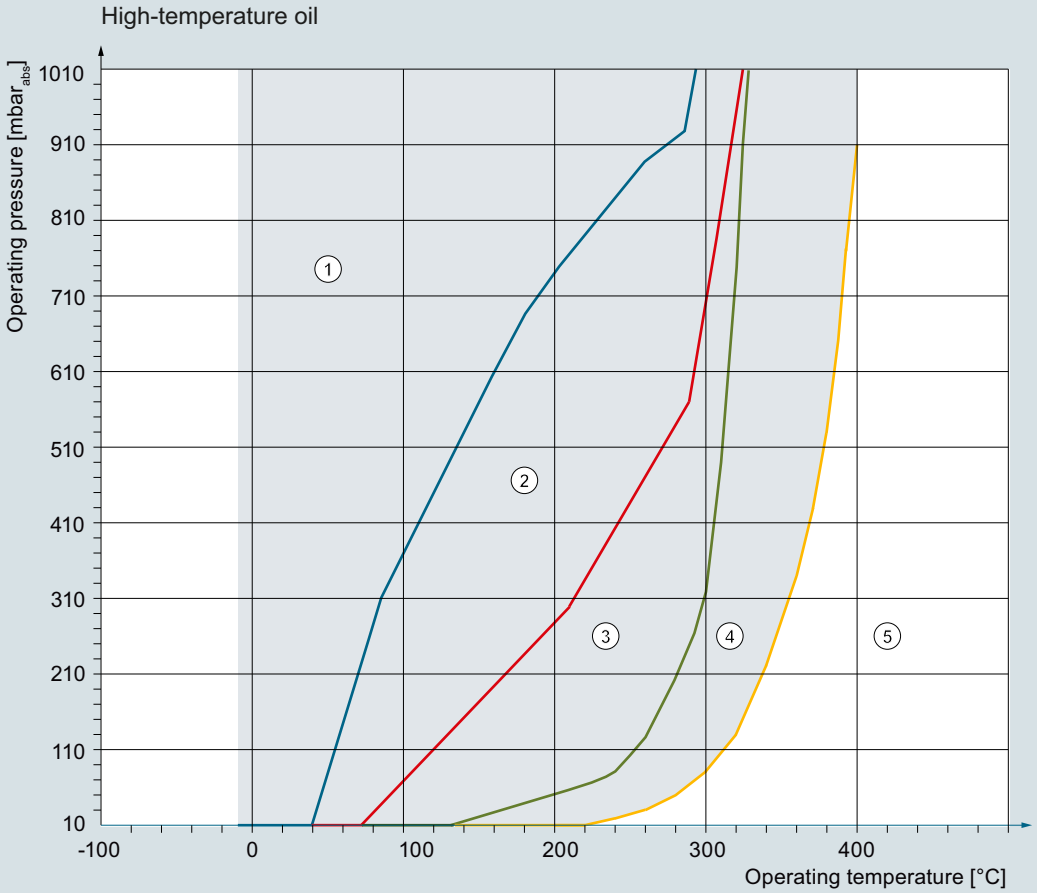
3 Operating range for which the **extended negative pressure service D85 or D88** is required

4 Please contact Technical Support for applications in this area.
Detailed information regarding application, process and ambient data are necessary.

5 Area in which you have to expect the destruction of the fill fluid.
A function of the remote seal is not specified here.

Permissible operating range:
Max. temperature limit: 300 °C
Min. temperature limit: -40 °C

Negative pressure applications with silicone oil M50



(1) Operating range of the standard remote seal design without special measures.

(2) Operating range for which the **negative pressure service D81 or D83** is required.

(3) Operating range for which the **extended negative pressure service D85 or D88** is required

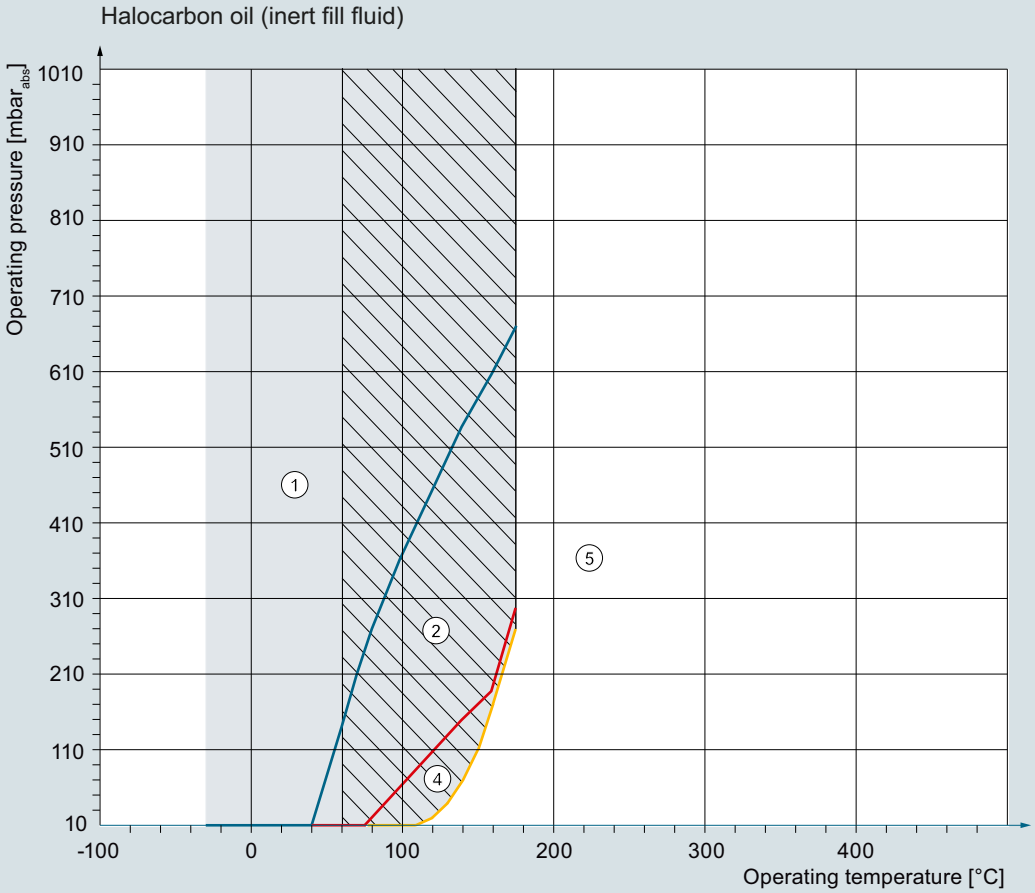
(4) Please contact Technical Support for applications in this area.
Detailed information regarding application, process and ambient data are necessary.

(5) Area in which you have to expect the destruction of the fill fluid.
A function of the remote seal is not specified here.

Permissible operating range:
Max. temperature limit: 400 °C
Min. temperature limit: -10 °C

Negative pressure applications with high-temperature oil

Technical description



(1) Operating range of the standard remote seal design without special measures.

(2) Operating range for which the **negative pressure service D81 or D83** is required.
Note: An extended negative pressure service is **not** possible for this fill fluid.

(4) Please contact Technical Support for applications in this area.
Detailed information regarding application, process and ambient data are necessary.

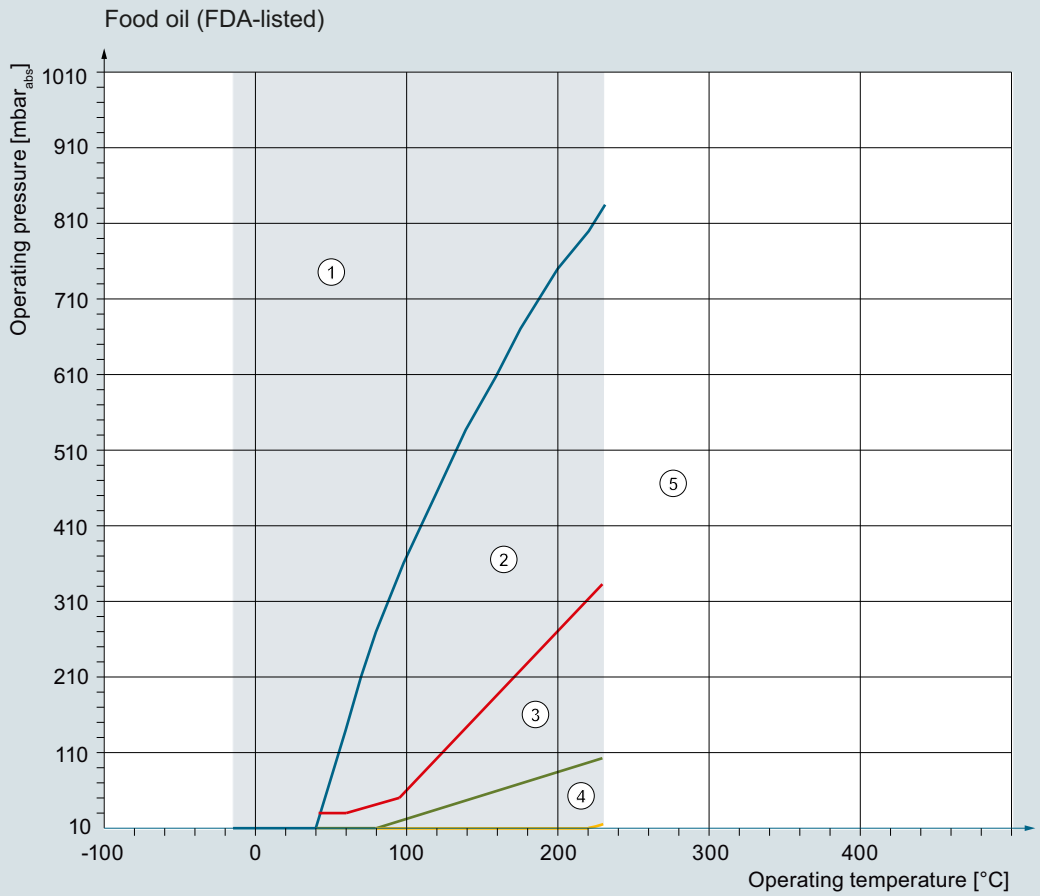
(5) Area in which you have to expect the destruction of the fill fluid.
A function of the remote seal is not specified here.

Permissible operating range:
Max. temperature limit: 175 °C
Min. temperature limit: -30 °C

Oxygen application for operating temperature between 60 and 175 °C
and also for operating pressure > 50 bar not permissible.

Negative pressure applications with halocarbon oil (inert filling liquid)

A BAM approval for process temperatures up to 60 °C (140 °F) and system pressures up to 50 bar (725 psi) is available for the oxygen application.



1 Operating range of the standard remote seal design without special measures.

2 Operating range for which the **negative pressure service D81 or D83** is required.

3 Operating range for which the **extended negative pressure service D85 or D88** is required

4 Please contact Technical Support for applications in this area.
Detailed information regarding application, process and ambient data are necessary.

5 Area in which you have to expect the destruction of the fill fluid.
A function of the remote seal is not specified here.

Permissible operating range:
Max. temperature limit: 230 °C
Min. temperature limit: -15 °C

Negative pressure applications with food oil (FDA listed)

Technical specifications

Temperature error Diaphragm seals

Temperature errors of diaphragm seals when connected to pressure transmitters for pressure, absolute pressure, differential pressure (single-sided) and level

	Nominal diameter/ design	Diaphragm diameter		Temperature error of remote seal f_{RS}		Temperature error of capillary f_{Cap}		Temperature error of process flange/connection spigot f_{PF}		Recommended min. measuring spans (guidance values, observe temp. error)	
		mm	(inch)	mbar/ 10 K	(psi/ 10 K)	mbar/ (10 K · m_{Cap})	(psi/ (10 K · m_{Cap}))	mbar/ 10 K	(psi/ 10 K)	mbar	(psi)
Sandwich design or with flange to EN 1092-1	DN 50 without tube	59	(2.32)	1.5	(0.022)	2	(0.029)	2	(0.029)	200	(2.90)
	DN 50 with tube	45	(1.89)	5	(0.073)	10	(0.145)	10	(0.145)	500	(7.25)
	DN 80 without tube	89	(3.50)	0.2	(0.003)	0.2	(0.003)	0.2	(0.003)	100	(1.45)
	DN 80 with tube	72	(2.83)	1	(0.015)	1	(1.015)	1	(1.015)	250	(3.63)
	DN 100 without tube	89	(3.50)	0.2	(0.003)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	DN 100 with tube	89	(3.50)	0.4	(0.006)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	DN 125 without tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)
	DN 125 with tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)
Sandwich design or with flange to ASME B16.5	2 inch without tube	59	(2.32)	1.5	(0.022)	2	(0.029)	2	(0.029)	200	(2.90)
	2 inch with tube	45	(1.89)	5	(0.073)	10	(0.145)	10	(0.145)	500	(7.25)
	3 inch without tube	89	(3.50)	0.2	(0.003)	0.2	(0.003)	0.2	(0.003)	100	(1.45)
	3 inch with tube	72	(2.83)	1	(0.015)	1	(1.015)	1	(1.015)	250	(3.63)
	4 inch without tube	89	(3.50)	0.2	(0.003)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	4 inch with tube	89	(3.50)	0.4	(0.006)	0.4	(0.006)	0.4	(0.006)	100	(1.45)
	5 inch without tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)
	5 inch with tube	124	(4.88)	0.2	(0.003)	0.1	(0.002)	0.1	(0.002)	20	(0.29)
Remote seal with union nut to DIN 11851	DN 25	25	(0.98)	20	(0.290)	60	(0.870)	60	(0.870)	6000	(87)
	DN 32	32	(1.26)	8	(0.116)	25	(0.363)	25	(0.363)	4000	(58)
	DN 40	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	DN 50	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)
	DN 65	59	(2.32)	3	(0.044)	4	(0.058)	4	(0.058)	500	(7.25)
	DN 80	72	(2.83)	1	(0.015)	1	(0.015)	1	(0.015)	250	(3.63)
Remote seal, screwed gland design	DN 50	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)
Remote seal with threaded socket to DIN 11851	DN 25	25	(0.98)	20	(0.290)	60	(0.870)	60	(0.870)	6000	(87)
	DN 32	32	(1.26)	8	(0.116)	25	(0.363)	25	(0.363)	4000	(58)
	DN 40	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	DN 50	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)
	DN 65	59	(2.32)	3	(0.044)	4	(0.058)	4	(0.058)	500	(7.25)
	DN 80	72	(2.83)	1	(0.015)	1	(0.015)	1	(0.015)	250	(3.63)
Clamp connection	1½ inch	32	(1.26)	8	(0.116)	25	(0.363)	25	(0.363)	4000	(58)
	2 inch	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	2½ inch	59	(2.32)	3	(0.044)	5	(0.073)	5	(0.073)	500	(7.25)
	3 inch	72	(2.83)	1	(0.015)	1	(0.015)	1	(0.015)	250	(3.63)
Miniature diaphragm seal	G1B	25	(0.98)	20	(0.290)	60	(0.870)	60	(0.870)	6000	(87)
	G1½B	40	(1.57)	4	(0.058)	10	(0.145)	10	(0.145)	2000	(29)
	G2B	52	(2.05)	4	(0.058)	5	(0.073)	5	(0.073)	500	(7.25)

Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Values apply to stainless steel as the diaphragm material.

Temperature errors of diaphragm seals with connection to differential pressure transmitters (double-sided)

	Nominal diameter/ design	Diaphragm diameter		Temperature error of remote seal f_{RS}		Temperature error of capillary f_{Cap}		Temperature error of process flange/connection spigot f_{PF}		Recommended min. measuring spans (guidance values, observe temperature error)	
		mm	(inch)	mbar/ 10 K	(psi/ 10 K)	mbar/ (10 K · m_{Cap})	(psi/ (10 K · m_{Cap}))	mbar/ 10 K	(psi/ 10 K)	mbar	(psi)
Sandwich design or with flange to EN 1092-1	DN 50 without tube	59	(2.32)	0.3	(0.0043)	0.3	(0.0045)	0.3	(0.0045)	250	(3.626)
	DN 50 with tube	45	(1.89)	1.26	(0.018)	1.7	(0.025)	1.7	(0.025)	250	(3.626)
	DN 80 without tube	89	(3.50)	0.05	(0.001)	0.05	(0.001)	0.05	(0.0007)	50	(0.725)
	DN 80 with tube	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.45)
	DN 100 without tube	89	(3.50)	0.05	(0.001)	0.07	(0.001)	0.07	(0.001)	50	(0.725)
	DN 100 with tube	89	(3.50)	0.1	(0.002)	0.07	(0.001)	0.07	(0.001)	50	(0.725)
	DN 125 without tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)	0.03	(0.0004)	20	(0.29)
	DN 125 with tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)	0.03	(0.0004)	20	(0.29)
Sandwich design with flange to ASME B16.5	2 inch without tube	59	(2.32)	0.3	(0.0043)	0.3	(0.0043)	0.3	(0.0045)	250	(3.626)
	2 inch with tube	45	(1.89)	1.26	(0.018)	1.7	(0.025)	1.7	(0.025)	250	(3.626)
	3 inch without tube	89	(3.50)	0.05	(0.001)	0.05	(0.0007)	0.05	(0.0007)	50	(0.725)
	3 inch with tube	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.45)
	4 inch without tube	89	(3.50)	0.05	(0.001)	0.07	(0.001)	0.07	(0.001)	50	(0.725)
	4 inch with tube	89	(3.50)	0.1	(0.002)	0.07	(0.001)	0.07	(0.001)	50	(0.725)
	5 inch without tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)	0.03	(0.0004)	20	(0.29)
	5 inch with tube	124	(4.88)	0.05	(0.001)	0.03	(0.0004)	0.03	(0.0004)	20	(0.29)
Remote seal, screwed gland design	DN 50	52	(2.05)	1	(0.015)	0.83	(0.012)	0.83	(0.012)	250	(3.626)
Remote seal with union nut to DIN 11851	DN 50	52	(2.05)	1	(0.015)	0.83	(0.012)	0.83	(0.012)	250	(3.626)
	DN 65	59	(2.32)	0.7	(0.010)	0.67	(0.010)	0.67	(0.010)	250	(3.626)
	DN 80	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.450)
Remote seal with threaded socket to DIN 11851	DN 50	52	(2.05)	1	(0.015)	0.83	(0.012)	0.83	(0.012)	250	(3.626)
	DN 65	59	(2.32)	0.7	(0.010)	0.67	(0.010)	0.67	(0.010)	250	(3.626)
	DN 80	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.450)
Clamp connection	2 inch	40	(1.57)	1	(0.015)	2.5	(0.036)	2.5	(0.036)	2000	(29.01)
	2½ inch	59	(2.32)	0.7	(0.010)	0.67	(0.010)	0.67	(0.010)	250	(3.626)
	3 inch	72	(2.83)	0.24	(0.004)	0.17	(0.003)	0.17	(0.003)	100	(1.450)

Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Values apply to stainless steel as the diaphragm material.

Temperature error inline seals

Temperature errors of inline seals when connected to pressure transmitters for gauge pressure and absolute pressure, and with single-sided connection to pressure transmitters for differential pressure

Nominal diameter/ design	Temperature error of remote seal f_{RS}		Temperature error of capillary f_{Cap}		Temperature error of process flange/connection spigot f_{PF}		Recommended min. measuring spans (guidance values, observe temperature error)	
	mbar/10 K	(psi/10 K)	mbar/10 K	(psi/10 K)	mbar/10 K	(psi/10 K)	mbar	(psi)
DN 25 (1 inch)	6.0	(0.0870)	8.5	(0.123)	8.5	(0.123)	1000	(14.5)
DN 40 (1½ inch)	4.5	(0.065)	4.5	(0.065)	4.5	(0.065)	250	(3.63)
DN 50 (2 inch)	4.0	(0.058)	3.0	(0.044)	3.0	(0.044)	100	(1.45)
DN 80 (3 inch)	9.5	(0.138)	5.0	(0.073)	5.0	(0.073)	100	(1.45)
DN 100 (4 inch)	8.0	(0.012)	3.0	(0.044)	3.0	(0.044)	100	(1.45)

Temperature errors of inline seals with double-sided connection to pressure transmitters for differential pressure

Nominal diameter/ design	Temperature error of remote seal f_{RS}		Temperature error of capillary f_{Cap}		Temperature error of process flange/connection spigot f_{PF}		Recommended min. measuring spans (guidance values, observe temperature error)	
	mbar/10 K	(psi/10 K)	mbar/10 K	(psi/10 K)	mbar/10 K	(psi/10 K)	mbar	(psi)
DN 25 (1 inch)	2.3	(0.033)	1.8	(0.026)	1.8	(0.026)	1000	(14.5)
DN 40 (1½ inch)	0.8	(0.012)	0.3	(0.004)	0.3	(0.004)	250	(3.63)
DN 50 (2 inch)	0.3	(0.004)	0.1	(0.002)	0.1	(0.002)	100	(1.45)
DN 80 (3 inch)	3.0	(0.044)	0.5	(0.007)	0.5	(0.007)	100	(1.45)
DN 100 (4 inch)	1.0	(0.015)	0.1	(0.002)	0.1	(0.002)	100	(1.45)

Remarks:

- Values apply for the filling liquids silicone oil M5, silicone oil M50, high-temperature oil, halocarbon oil and food oil (FDA listed).
- Half the values apply to glycerin/water mixture as the filling liquid.
- Values apply to stainless steel as the diaphragm material.
- Diaphragm thickness 0.05 mm (0.002 inch) for DN 25/DN 40/DN 50 and 0.1 mm (0.004 inch) for DN 80/DN 100

Calculation of the temperature error

The following equation is used to calculate the temperature error:

$$dp = (\vartheta_{RS} - \vartheta_{Cal}) \cdot f_{RS} + (\vartheta_{Cap} - \vartheta_{Cal}) \cdot l_{Cap} \cdot f_{Cap} + (\vartheta_{TR} - \vartheta_{Cal}) \cdot f_{PF}$$

dp	Additional temperature error (mbar)
ϑ_{RS}	Temperature on remote seal diaphragm (generally corresponds to temperature of medium)
ϑ_{Cal}	Calibration (reference) temperature (20 °C (68 °F))
f_{RS}	Temperature error of remote seal
ϑ_{Cap}	Ambient temperature on the capillaries
l_{Cap}	Capillary length
f_{Cap}	Temperature error of capillaries
ϑ_{TR}	Ambient temperature on pressure transmitter
f_{PF}	Temperature error of the oil filling in the process flanges of the pressure transmitter

Example of temperature error calculation

Existing conditions:

SITRANS P pressure transmitter for differential pressure, 250 mbar, set to 0 ... 100 mbar, with DN 100 remote seal diaphragms without tube, diaphragm made of stainless steel, mat. No. 1.4404/316L	f_{RS} = 0.05 mbar/10 K (0.039 inH_2O/10 K)
Capillary length	l_{Cap} = 6 m (19.7 ft)
Capillaries fitted on both sides	f_{Cap} = 0.07 mbar/(10 K · m_{Cap}) (0.028 inH_2O/(10 K · m_{Cap}))
Filling liquid silicone oil M5	f_{PF} = 0.07 mbar/10 K (0.028 inH_2O/10 K)
Process temperature	ϑ_{RS} = 100 °C (212 °F)
Temperature on the capillaries	ϑ_{Cap} = 50 °C (122 °F)
Temperature on pressure transmitter	ϑ_{TR} = 50 °C (122 °F)
Calibration temperature	ϑ_{Cal} = 20 °C (68 °F)

Required:

Additional temperature error of remote seals: dp

Calculation:

in mbar

dp = (100 °C – 20 °C) · 0.05 mbar/10 K + (50 °C – 20 °C) · 6 m · 0.07 mbar/(10 K · m) + (50 °C – 20 °C) · 0.07 mbar/10 K

dp = 0.4 mbar + 1.26 mbar + 0.21 mbar

in inH_2O

dp = (212 °F - 68 °F) · 0.039 inH_2O/10 K + (112 °F - 68 °F) · 19.7 ft · 0.028 inH_2O/(10 K · 3.28 ft) + (112 °F - 68 °F) · (0.028 inH_2O/10 K)

dp = 0.16 inH_2O + 0.51 inH_2O + 0.08 inH_2O

Result:

dp = 1.87 mbar (0.75 inH_2O)
(corresponds to 2.27% of set measuring span)

Note

The determined temperature error 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 temperature errors listed in the previous table are based on the use of stainless steel as the diaphragm material. If other diaphragm materials are used, the temperature errors change as follows:

Diaphragm material	Change in temperature error of remote seal
	Increase in values by
Stainless steel, Duplex, ...	See previous tables
Hastelloy C4, mat. No. 2.4602	50 %
Hastelloy C276, mat. No. 2.4819	50 %
Monel 400, mat. No. 2.4360	60 %
Tantalum	50 %
Titanium	50 %
PTFE coating on stainless steel diaphragm	80 %
ECTFE coating or PFA coating on stainless steel diaphragm	100 %
Gold coating on stainless steel diaphragm	40 %
Inconel	50 %
Incoloy	50 %

Maximum temperature of medium

Note:
When taking into account the maximum medium temperature, the application limits of the fill fluids and gaskets used as well as the pressure/temperature limits of the respective process connections must also be taken into consideration.

The following maximum temperatures of the medium apply depending on the material of the wetted parts.

Material	Max. temperature of medium	Min./max. pressure
Stainless steel, 316L	400 °C (752 °F)	No restriction
PTFE coating	200 °C (392 °F)	< 0 bar (0 psi); gauge pressure
	260 °C (500 °F)	0 bar (0 psi) ... 25 bar (363 psi); gauge pressure
	150 °C (302 °F)	25 bar (363 psi) ... 40 bar (580 psi); gauge pressure
	50 °C (302 °F)	40 bar (580 psi) ... 60 bar (870 psi); gauge pressure
ECTFE coating	150 °C (302 °F)	For pressures < 1 bar (14.5 psi) on request
PFA coating	200 °C (392 °F)	< 0 bar (0 psi); gauge pressure
	260 °C (500 °F)	25 bar (363 psi)/40 bar (580 psi); gauge pressure
	150 °C (302 °F)	40 bar (580 psi)/60 bar (870 psi); gauge pressure
	50 °C (302 °F)	For pressures < 1 bar (14.5 psi) on request
Hastelloy C4, mat. No. 2.4602	400 °C (752 °F)	No restriction
Hastelloy C276, mat. No. 2.4819	400 °C (752 °F)	No restriction
Hastelloy C22, mat. No. 2.4602	400 °C (752 °F)	No restriction
Monel 400, mat. No. 2.4360	400 °C (752 °F)	No restriction
Tantalum	300 °C (572 °F)	No restriction
Duplex, mat. No. 1.4462	250 °C (482 °F)	No restriction
Titanium	150 °C (302 °F)	No restriction
Inconel	400 °C (752 °F)	No restriction
Incoloy	400 °C (752 °F)	No restriction
Gold coating	400 °C (752 °F)	No restriction

Maximum capillary length for diaphragm seals (guidance values)

Nom. diam.		Max. length of capillary			
		Diaphragm seal		inline seal	
		m	(ft)	m	(ft)
DN 25	(1 inch)	2.5	(8.2)	2.5	(8.2)
DN 32	(1¼ inch)	2.5	(8.2)	2.5	(8.2)
DN 40	(1½ inch)	4	(13.1)	6	(19.7)
DN 50	(2 inch)	6	(19.7)	10	(32.8)
DN 65	(2½ inch)	8	(26.2)	10	(32.8)
DN 80	(3 inch)	15	(49.1)	10	(32.8)
DN 100	(4 inch)	15	(49.1)	10	(32.8)
DN 125	(5 inch)	15	(49.1)	-	-

Response times

The values listed in the following table are the response times (in seconds per meter of capillary) for a change in pressure which corresponds to the set measuring span.

The listed values must be multiplied by the respective length of the capillary, or with transmitters for differential pressure and flow by the total length of both capillaries.

The response times are independent of the set measuring span within the range of the respective transmitter. The response times are of insignificant importance for measuring spans above 10 bar (145 psi). The response times of the pressure transmitters are not considered in the table.

Filling liquid	Density		Temperature on capillary		Response time in s/m (s/ft) with max. measuring span of pressure transmitter					
	kg/dm³	(lb/in³)	°C	(°F)	250 mbar	(101 inH_2O)	600 mbar	(241 inH_2O)	1600 mbar	(643 inH_2O)
Silicone oil M5	0.914	(0.033)	+60	(140)	0.06	(0.018)	0.02	(0.006)	0.01	(0.003)
			+20	(68)	0.11	(0.034)	0.02	(0.006)	0.02	(0.006)
			- 20	(-4)	0.3	(0.091)	0.12	(0.037)	0.05	(0.015)
Silicone oil M50	0.966	(0.035)	+60	(140)	0.6	(0.183)	0.25	(0.076)	0.09	(0.027)
			+20	(68)	0.61	(0.186)	0.26	(0.079)	0.1	(0.030)
			- 20	(-4)	1.69	(0.515)	0.71	(0.216)	0.27	(0.082)
High-temperature oil	1.070	(0.039)	+60	(140)	0.14	(0.043)	0.06	(0.018)	0.02	(0.006)
			+20	(68)	0.65	(0.198)	0.27	(0.082)	0.1	(0.030)
			-10	(14)	3.96	(1.207)	1.65	(0.503)	0.62	(0.189)
Halocarbon oil	1.968	(0.071)	+60	(140)	0.07	(0.021)	0.03	(0.009)	0.01	(0.003)
			+20	(68)	0.29	(0.088)	0.12	(0.037)	0.05	(0.015)
			- 20	(-4)	2.88	(0.878)	1.2	(0.366)	0.45	(0.137)
Food oil (FDA listed)	0.920	(0.033)	+60	(140)	0.75	(0.229)	0.33	(0.101)	0.17	(0.052)
			+20	(68)	4	(1.220)	1.75	(0.534)	0.67	(0.204)
			- 20	(-4)	20	(6.100)	8.5	(2.593)	3.25	(0.991)

Permissible data of filling liquids for pressure and temperature see diagrams on page 1/327 ff.

More information

Specification of process conditions for selection and ordering data

Ambient temperature range

As standard, the remote seal systems are optimized for an ambient temperature range of -10 to +50 ° C (14 to +122 ° F). Therefore, in the ordering options, the **order code "D66" is** preset.

If the range of the ambient temperature deviates from this, you have the possibility to choose other ambient temperature ranges:

- With the **order code D67**, a range from -40 to +50 °C (-40 to +122 °F)
- With the **order code D68**, a range from -10 to +85 °C (14 to +185 °F)

In the case of a **special version**, which you can select with the **order option Y99** in the device settings, it is possible to enter the ambient temperature as a numerical value.

Process temperature

The standard optimization for the process temperature depends on the filling liquid used:

Filling liquid	Code	Optimized temperature range as standard
Silicone M50	B	-10 ... +200 °C (14 ... +392 °F)
High-temperature oil	C	-10 ... +300 °C (14 ... +572 °F)
Silicone oil M5	A	-40 ... +140 °C (-40 ... +284 °F)
Food-grade oil (FDA grade)	E	-10 ... +140 °C (14 ... +284 °F)
Halocarbon oil	D	-20 ... +60 °C (-4 ... +140 °F)

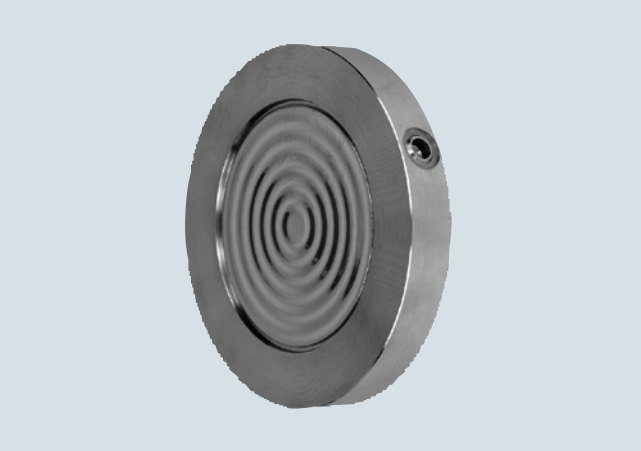
- **If the process temperatures** deviate from the temperature ranges mentioned in the table above, we ask you to send the process temperature with the **order code Y50** along with the order.
- If the remote seal has a small diameter (< DN 50/2") or a long capillary (> 4 m), we also ask you to provide the process data with the **following order code** when ordering.

These entries are transmitted and ensure the correct functioning of the remote seal systems.

Ambient temperature range	Order code
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

Diaphragm seals of sandwich design with flexible capillary

Overview



Diaphragm seals of sandwich design

Technical specifications

Diaphragm seals of sandwich design	
Nominal diameter	Nominal pressure
Connecting standard EN 1092-1	
• DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125	PN 16 ... PN 400
Connecting standard ASME B16.5	
• 1 inch, 1½ inch, 2 inch, 2½ inch, 3 inch, 4 inch, 5 inch	Class 150 ... class 2500
Connecting standard J.I.S.	
• DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125	10K ... 63K
Sealing surface	
• For stainless steel, mat. No. 1.4404/316L	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
• For the other materials	To EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel mat. no. 1.4404/316L
• Wetted parts	Stainless steel mat. no. 1.4404/316L
	• Without coating
	• PTFE coating
	• ECTFE coating (for vacuum on request)
	• PFA coating
	Monel 400, mat. No. 2.4360
	Hastelloy C276, mat. No. 2.4819
	Hastelloy C4, mat. No. 2.4602
	Hastelloy C22, mat. no. 2.4602
	Tantalum
	Titanium, mat. no. 3.7035
	Nickel 201
	Duplex 2205, mat. no. 1.4462
	Stainless steel 316L, gold plated, thickness approx. 25 µm
• Capillary	Stainless steel, mat. No. 1.4571/316Ti
• Sheath	Spiral protective tube made of stainless steel, mat. No. 1.4404/316L
Sealing material in the process flanges	
• For pressure transmitters, absolute pressure transmitters and low-pressure applications	Copper
• For other applications	Viton
Maximum pressure	See above and the technical data of the pressure transmitters
Tube length	Without tube as standard (tube available on request)
Capillary	
• Length	Max. 10 m (32.8 ft), longer lengths on request
• Internal diameter	max. 2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
Filling liquid	Silicone oil M5
	Silicone oil M50
	High-temperature oil
	Halocarbon oil (for measuring O_2)
	Food grade oil (FDA listed)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal
	More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals
Weight	Approx. 4 kg (8.82 lb)
Certificate and approvals	
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Selection and Ordering data	Article No.	Order code
Diaphragm seal		
Sandwich type design, with flexible capillary tube, connected with flexible capillary tube to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off ↗	7MF0800-	
• SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off ↗	7MF0801-	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off ↗	7MF0802-	
	■■■■■-0■■■	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Nominal diameter **Nominal pressure**		
Connecting standard EN 1092-1		
(DN 25, DN 40 and DN 50 recommended only for pressure transmitters)		
DN 25 PN 16 ... 400	0BQ	
DN 40 PN 16 ... 400	0DQ	
DN 50 PN 16 ... 400	0EQ	
DN 65 PN 16 ... 400	0FQ	
DN 80 PN 16 ... 400	0GQ	
DN 100 PN 16 ... 400	0HQ	
DN 125 PN 16 ... 400	0JQ	
Connecting standard ASME B16.5		
(1 inch, 1½ inch and 2 inch recommended only for pressure transmitters)		
1 inch class 150 ... 2500	1KX	
1½ inch class 150 ... 2500	1LX	
2 inch class 150 ... 2500	1MX	
2½ inch class 150 ... 2500	1NX	
3 inch class 150 ... 2500	1PX	
4 inch class 150 ... 2500	1QX	
5 inch class 150 ... 2500	1RX	
Connecting standard J.I.S.		
(DN 25, DN 40 and DN 50 recommended only for pressure transmitters)		
DN 25 10K ... 63K	2BW	
DN 40 10K ... 63K	2DW	
DN 50 10K ... 63K	2EW	
DN 65 10K ... 63K	2FW	
DN 80 10K ... 63K	2GW	
DN 100 10K ... 63K	2HW	
DN 125 10K ... 63K	2JW	
Other version Add Order code and plain text	9AA	H1Y
Length of capillary		
1 m	10	
1,6 m	11	
2 m	12	
2,5 m	13	
3 m	14	
4 m	15	
5 m	16	
6 m	17	
7 m	18	
8 m	20	
9 m	21	
10 m	22	

Selection and Ordering data	Article No.	Order code
Diaphragm seal		
Sandwich type design, with flexible capillary tube, connected with flexible capillary tube to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	7MF0800-	
• SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off	7MF0801-	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off	7MF0802-	
	■■■■■-0■■■	■■■
11 m (only for 7MF0802)	23	
12 m (only for 7MF0802)	24	
13 m (only for 7MF0802)	25	
14 m (only for 7MF0802)	26	
15 m (only for 7MF0802)	27	
Other version Add Order code and plain text	98	L1Y
Filling liquid		
Silicone oil M50	B	
High-temperature oil	C	
Silicone oil M5	A	
Food-grade oil (FDA listed)	E	
Halocarbon oil	D	
Other version Add Order code and plain text	Z	P1Y
Wetted parts materials		
Stainless steel 316L		
• Without coating	A	
• With PFA coating	D	
• With PTFE coating	E0	
• With ECTFE coating	F	
Monel 400, 2.4360	G	
Hastelloy C276, 2.4819	J	
Tantalum	K	
Titanium, 3.7035	L0	
Nickel 201	M0	
Diaphragm Duplex, 1.4462	Q	
Diaphragm plus flange Duplex, 1.4462	R	
Stainless steel 316L with gold coating	S0	
Hastelloy C4, 2.4610	U0	
Hastelloy C22, 2.4602	V0	
Other version Add Order code and plain text	Z8	Q1Y
Extension length		
• without	0	
• 50 mm (2")	1	
• 100 mm (4")	2	
• 150 mm (6")	3	
• 200 mm (8")	4	
• 250 mm (10")	5	
Other version Add Order code and plain text	Z8	Q1Y

1

Diaphragm seals of sandwich design with flexible capillary

Selection and Ordering data	Article No.	Order code
Diaphragm seal		
Sandwich type design, with flexible capillary tube, connected with flexible capillary tube to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	**7MF0800-**	
• SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off	**7MF0801-**	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off	**7MF0802-**	
	-0	
Customer-specific extension length		
• Wetted parts stainless steel without coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**A 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**A 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**A 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**A 4**
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		**A 5**
• Wetted parts stainless steel with ECTFE coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**F 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**F 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**F 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**F 4**
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		**F 5**
• Wetted parts stainless steel with PFA coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**D 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**D 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**D 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**D 4**
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		**D 5**
• Wetted parts Monel 400		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**G 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**G 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**G 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**G 4**

Selection and Ordering data	Article No.	Order code
Diaphragm seal		
Sandwich type design, with flexible capillary tube, connected with flexible capillary tube to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	**7MF0800-**	
• SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off	**7MF0801-**	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off	**7MF0802-**	
	-0	
• Wetted parts Hastelloy C276		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**J 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**J 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**J 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**J 4**
• Wetted parts Tantalum		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**K 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**K 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**K 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**K 4**

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Factory certificates	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	**C11**
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	**C12**
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	**C13**
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	**C15**
Certificate of FDA-approved fill oil (to EN10204-2.2)	**C17**
Factory certificate functional safety (SIL2/3), devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	**C20**
Accessories	
Spark arrestor (for gauge and absolute pressure transmitters)	**D61**
Spark arrestor (for differential pressure and level transmitters)	**D62**
Low-temperature version (for Silicon Oil M50 only)	**D67**
Negative pressure services	
Negative pressure service (for gauge and absolute pressure transmitters)	**D81**
Negative pressure service (for differential pressure transmitters)	**D83**
Extended negative pressure service (for gauge and absolute pressure transmitters) (only 7MF0800)	**D85**
Extended negative pressure service (for differential pressure transmitters)	**D88**
General product approvals without explosion proof approvals	
Oil-and grease-free cleaned version (for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-and grease-free cleaned version (not for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)	**E87**
Sealing surface	
Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)	**M50**
Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)	**M54**
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)	**M64**
Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)	
• DN 25	**M70**
• DN 40	**M71**
• DN 50	**M72**
• DN 80	**M73**
• DN 100	**M74**
• DN 125	**M75**
Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)	
• DN 25	**M76**
• DN 40	**M77**
• DN 50	**M78**
• DN 80	**M79**
• DN 100	**M80**
• DN 125	**M81**

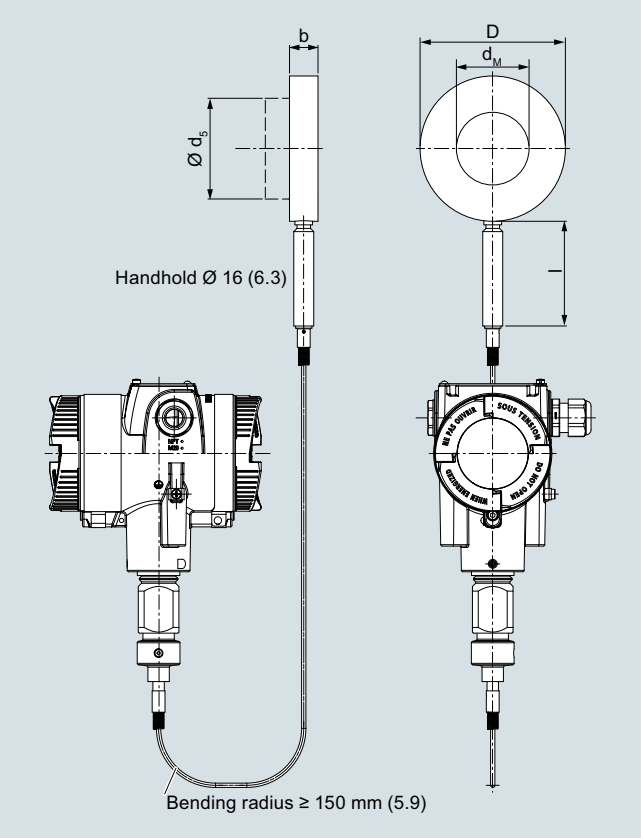
Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)	
• DN 25	**M82**
• DN 40	**M83**
• DN 50	**M84**
• DN 80	**M85**
• DN 100	**M86**
• DN 125	**M87**
Capillary connection (only for 7MF0800)	
Single-side mounted at differential pressure transmitters at high-side	**S03**
Single-side mounted at differential pressure transmitters at low-side	**S04**
Capillary coating	
PE protective tube	
1 m	**S10**
1,6 m	**S11**
2 m	**S12**
2,5 m	**S13**
3 m	**S14**
4 m	**S15**
5 m	**S16**
6 m	**S17**
7 m	**S18**
8 m	**S19**
9 m	**S20**
10 m	**S21**
11 m (only for 7MF0802)	**S22**
12 m (only for 7MF0802)	**S23**
13 m (only for 7MF0802)	**S24**
14 m (only for 7MF0802)	**S25**
15 m (only for 7MF0802)	**S26**
PTFE protective tube	
1 m	**S40**
1,6 m	**S41**
2 m	**S42**
2,5 m	**S43**
3 m	**S44**
4 m	**S45**
5 m	**S46**
6 m	**S47**
7 m	**S48**
8 m	**S49**
9 m	**S50**
10 m	**S51**
11 m (only for 7MF0802)	**S52**
12 m (only for 7MF0802)	**S53**
13 m (only for 7MF0802)	**S54**
14 m (only for 7MF0802)	**S55**
15 m (only for 7MF0802)	**S56**

Diaphragm seals of sandwich design with flexible capillary

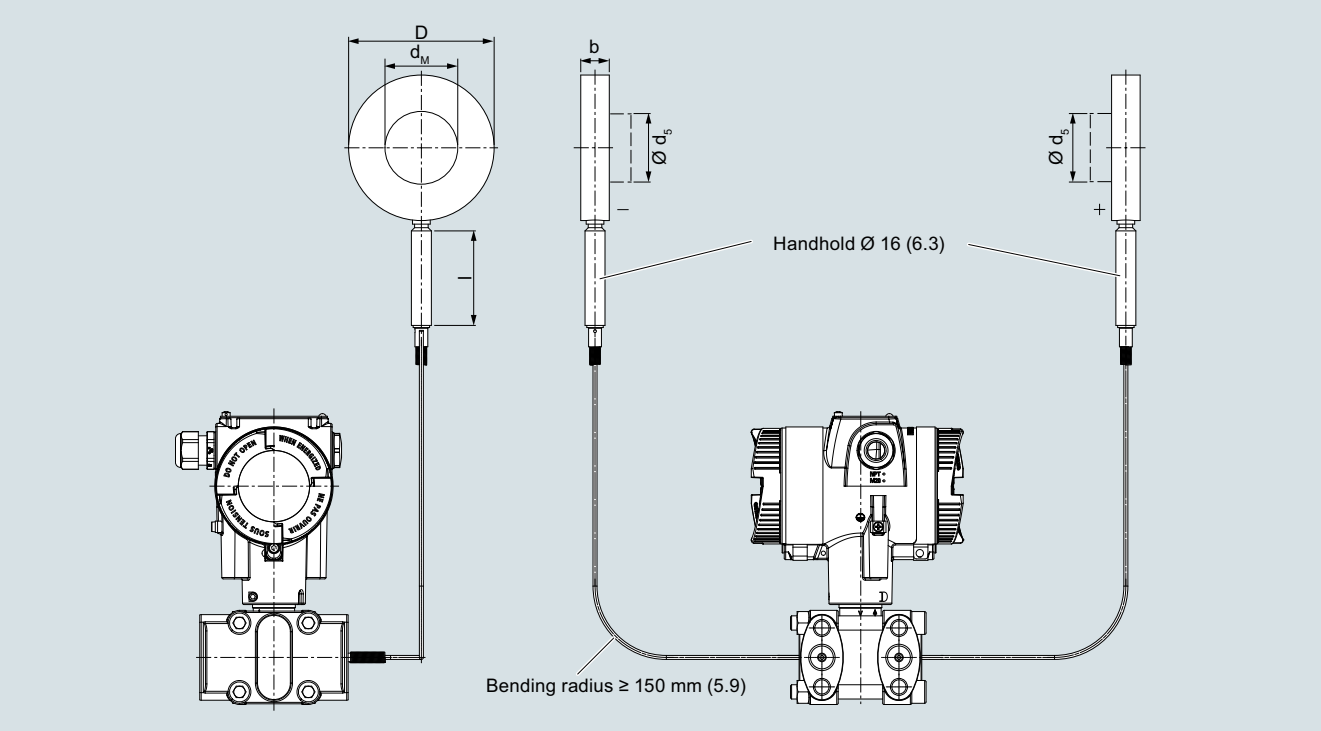
Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
PVC protective tube	
1 m	**S70**
1,6 m	**S71**
2 m	**S72**
2,5 m	**S73**
3 m	**S74**
4 m	**S75**
5 m	**S76**
6 m	**S77**
7 m	**S78**
8 m	**S79**
9 m	**S80**
10 m	**S81**
11 m (only for 7MF0802)	**S82**
12 m (only for 7MF0802)	**S83**
13 m (only for 7MF0802)	**S84**
14 m (only for 7MF0802)	**S85**
15 m (only for 7MF0802)	**S86**
Customer-specific tube length	
Customer-specific tube length (specify in plain text)	**Y44**
Specification of process conditions[1)]	
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

1) See also "Specification of process conditions for selection and ordering data", page 1/337.

Dimensional drawings



Diaphragm seals of sandwich design with flexible capillary for connection to SITRANS P320/420 pressure transmitters for pressure, dimensions in mm (inch)



Diaphragm seals of sandwich design (without flange) with flexible capillary for connection to SITRANS P320/420 pressure transmitters for absolute pressure or differential pressure and flow, dimensions in mm (inch)

Diaphragm seals of sandwich design with flexible capillary

Connection to EN 1092-1

Nom. diameter	Nom. pressure	b	D	d_5	d_M with tube	d_M w/o tube	l
		mm	mm	mm	mm	mm	mm
DN 25	PN 16 ... PN 400	20	68	24,5	22.6	27	100
DN 40		20	88	38	30	40	100
DN 50		20	102	48.3	40	51	100
DN 65		20	122	48,3	40	65	100
DN 80		20	138	76	65	85	100
DN 100		20	158	94	85	85	100
DN 125		22	188	125	16	116	100

Connection to ASME B16.5

Nom. diameter	Nom. pressure	b	D	d_5	d_M with tube	d_M w/o tube	l
	lb/sq.in.	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
1 inch	150 ... 2500	20 (0.79)	51 (2.01)	24.5 (0,96)	22.6 (0.89)	30 (1.18)	100 (3.94)
1½ inch		20 (0.79)	73 ()	38 (1.5)	30 (1.18)	40 (1.57)	100 (3.94)
2 inch		20 (0.79)	100 (3.94)	48.3 (1.9)	40 (1.57)	51 (2.01)	100 (3.94)
2½ inch		20 (0.79)	105 (4.13)	48.3 (1.9)	40 (1.57)	65 (2.56)	100 (3.94)
3 inch		20 (0.79)	134 (5.28)	72 (3)	65 (2.56)	85 (3.35)	100 (3.94)
4 inch		20 (0.79)	158 (6.22)	94 (3.69)	85 (3.35)	85 (3.35)	100 (3.94)
5 inch		22 (0.87)	186 (7.32)	125 (4.92)	116 (4.57)	116 (4.57)	100 (3.94)

Connection to J.I.S.

Nom. diameter	Nom. pressure	b	D 10K, 20K	D 30K ... 63K	d_5	d_M with tube	d_M w/o tube	l
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
DN 25	10K ... 63K	20 (0.79)	67 (2.64)	70 (2.76)	24.5 (0.96)	22.6 (0.89)	30 (1.18)	100 (3.94)
DN 40		20 (0.79)	81 (3.19)	90 (3.54)	38 (1.5)	30 (1.18)	36 (1.42)	100 (3.94)
DN 50		20 (0.79)	96 (3.78)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	100 (3.94)
DN 65		20 (0.79)	116 (4.57)	130 (5.12)	48.3 (1.9)	40 (1.57)	65 (2.56)	100 (3.94)
DN 80		20 (0.79)	132 (5.2)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	100 (3.94)
DN 100		20 (0.79)	160 (6.3)	160 (6.3)	94 (3.69)	85 (3.35)	85 (3.35)	100 (3.94)
DN 125		20 (0.79)	195 (7.68)	195 (7.68)	125 (4.92)	116 (4.57)	116 (4.57)	100 (3.94)

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

d_M: Effective diaphragm diameter

Overview

Diaphragm seals of flange design

Technical specifications

Diaphragm seals of flange design with flexible capillary

Nominal diameter	Nominal pressure
Connecting standard EN 1092-1	
• DN 25	PN 10/16/25/40/63/100/160/250
• DN 40	PN 10/16/25/40/63/100/160
• DN 50	PN 10/16/25/40/63/100
• DN 80	PN 10/16/25/40/100
• DN 100	PN 10/16/25/40
• DN 125	PN 16/40
Connecting standard ASME B16.5	
• 1 inch	Class 150/300/600/1500
• 1½ inch	Class 150/300/400/600/900/1500
• 2 inch	Class 150/300/400/600/900/1500
• 3 inch	Class 150/300/600/1500
• 4 inch	Class 150/300/400/1500
• 5 inch	Class 150/300/400
Connecting standard J.I.S.	
• DN 50	10K
• DN 80	20K
• DN 100	40K
Sealing surface	
• For stainless steel, mat. No. 1.4404/316L	To EN 1092-1, form B1 or ASMR B16.5 RF 125 ... 250 AA
• For the other materials	To EN 1092-1, form B2 or ASME B16.5 RFSF

Materials	
• Main body	Stainless steel mat. no. 1.4404/316L
• Wetted parts	Stainless steel mat. no. 1.4404/316L • Without coating • PTFE coating • ECTFE coating (for vacuum on request) • PFA coating Monel 400, mat. No. 2.4360 Hastelloy C276, mat. No. 2.4819 Hastelloy C4, mat. No. 2.4602 Hastelloy C22, W.-Nr. 2.4602 Tantalum Titanium, W.-Nr. 3.7035 Nickel 201 Duplex 2205, mat. no. 1.4462 Stainless steel 316L, gold plated, thickness approx. 25 µm
• Capillary	Stainless steel, mat. No. 1.4571/316Ti
• Sheath	Spiral protective tube made of stainless steel, mat. no. 1.4404/316L
Sealing material in the process flanges	
• For pressure transmitters, absolute pressure transmitters and low-pressure applications	Copper
• For other applications	Viton
Maximum pressure	See above and the technical data of the pressure transmitter
Tube length	Without tube as standard (tube available on request)
Capillary	
• Length	Max. 10 m (32.8 ft), longer lengths on request
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
Filling liquid	
(for remote seals of sandwich and flange design)	Silicone oil M5 Silicone oil M50 High-temperature oil Halocarbon oil (for measuring O_2) Food oil (FDA listed)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals
Weight	Approx. 4 kg (8.82 lb)
Certificate and approvals	
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

1

Diaphragm seals of flange design with flexible capillary

Selection and Ordering data		Article No.	Order code
Diaphragm seal			
Flange type design, with flexible capillary tube, connected with flexible capillary tube to a			
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off		**7MF0810-**	
• SITRANS P320/P420 transmitter for absolute pressure from differential pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off		**7MF0811-**	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off		**7MF0812-**	
		■■■■■-0■■■	**■■■**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Nominal diameter	**Nominal pressure**		
Connecting standard EN 1092-1			
(DN 25, DN 40 and DN 50 recommended only for pressure transmitters)			
DN 25	PN 10/16/25/40	**0BD**	
	PN 63/100	**0BF**	
	PN 160	**0BG**	
	PN 250	**0BH**	
DN 40	PN 10/16/25/40	**0DD**	
	PN 63/100	**0DF**	
	PN 160	**0DG**	
DN 50	PN 10/16/25/40	**0ED**	
	PN 63	**0EE**	
	PN 100	**0EF**	
DN 80	PN 10/16/25/40	**0GD**	
	PN 100	**0GF**	
DN 100	PN 10/16	**0HB**	
	PN 25/40	**0HD**	
DN 125	PN 16	**0JB**	
	PN 40	**0JD**	
Connecting standard ASME B16.5			
(1 inch, 1½ inch and 2 inch recommended only for pressure transmitters)			
1 inch	class 150	**1KL**	
	class 300	**1KM**	
	class 600	**1KN**	
	class 1500	**1KP**	
1½ inch	class 150	**1LA**	
	class 300	**1LB**	
	class 400/600	**1LD**	
	class 900/1500	**1LF**	
2 inch	class 150	**1MA**	
	class 300	**1MB**	
	class 400/600	**1MD**	
	class 900/1500	**1MF**	
3 inch	class 150	**1PA**	
	class 300	**1PB**	
	class 600	**1PD**	
	class 1500	**1PF**	
4 inch	class 150	**1QA**	
	class 300	**1QB**	
	class 400	**1QC**	
	class 1500	**1QF**	
5 inch	class 150	**1RA**	
	class 300	**1RB**	
	class 400	**1RC**	

Selection and Ordering data		Article No.	Order code
Diaphragm seal			
Flange type design, with flexible capillary tube, connected with flexible capillary tube to a			
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off		**7MF0810-**	
• SITRANS P320/P420 transmitter for absolute pressure from differential pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off		**7MF0811-**	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off		**7MF0812-**	
		■■■■■-0■■■	**■■■**
Connecting standard J.I.S.			
(DN 50 recommended only for pressure transmitters)			
DN 50	10 K	**2ES**	
	20 K	**2ET**	
	40 K	**2EU**	
DN 80	10 K	**2GS**	
	20 K	**2GT**	
	40 K	**2GU**	
DN 100	10 K	**2HS**	
	20 K	**2HT**	
	40 K	**2HU**	
Other version Add Order code and plain text		**9AA**	**H1Y**
Transmitter connection			
Connection via capillary tube Length of capillary			
1 m		**10**	
1,6 m		**11**	
2 m		**12**	
2,5 m		**13**	
3 m		**14**	
4 m		**15**	
5 m		**16**	
6 m		**17**	
7 m		**18**	
8 m		**20**	
9 m		**21**	
10 m		**22**	
11 m (only for 7MF0812)		**23**	
12 m (only for 7MF0812)		**24**	
13 m (only for 7MF0812)		**25**	
14 m (only for 7MF0812)		**26**	
15 m (only for 7MF0812)		**27**	
Other version Add Order code and plain text		**98**	**L1Y**
Filling liquid			
Silicone oil M50			**B**
High-temperature oil			**C**
Silicone oil M5			**A**
Food-grade oil (FDA listed)			**E**
Halocarbon oil			**D**
Other version Add Order code and plain text			**Z** **P1Y**

Selection and Ordering data	Article No.	Order code
Diaphragm seal		
Flange type design, with flexible capillary tube, connected with flexible capillary tube to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	**7MF0810-**	
• SITRANS P320/P420 transmitter for absolute pressure from differential pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off	**7MF0811-**	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off	**7MF0812-**	
	■■■■■-0■■■	**■■■**
Wetted parts materials		
Stainless steel 316L		
• Without coating		**A**
• With PFA coating		**D**
• With PTFE coating		**E 0**
• With ECTFE coating		**F**
Monel 400, 2.4360		**G**
Hastelloy C276, 2.4819		**J**
Tantalum		**K**
Titanium, 3.7035		**L 0**
Nickel 201		**M 0**
Diaphragm Duplex, 1.4462		**Q**
Diaphragm plus flange Duplex, 1.4462		**R**
Stainless steel 316L with gold coating		**S 0**
Hastelloy C4, 2.4610		**U 0**
Hastelloy C22, 2.4602		**V 0**
Other version Add Order code and plain text		**Z 8 Q 1 Y**
Extension length		
• without		**0**
• 50 mm (2")		**1**
• 100 mm (4")		**2**
• 150 mm (6")		**3**
• 200 mm (8")		**4**
• 250 mm (10")		**5**
Other version Add Order code and plain text		**Z 8 Q 1 Y**
Customer-specific extension length		
• Wetted parts stainless steel without coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**A 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**A 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**A 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**A 4**
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		**A 5**
• Wetted parts stainless steel with ECTFE coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**F 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**F 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**F 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**F 4**
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		**F 5**
• Wetted parts stainless steel with PFA coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**D 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**D 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**D 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**D 4**
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		**D 5**
• Wetted parts Monel 400		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**G 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**G 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**G 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**G 4**
• Wetted parts Hastelloy C276		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**J 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**J 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**J 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**J 4**

Diaphragm seals of flange design with flexible capillary

Selection and Ordering data	Article No.	Order code
Diaphragm seal		
Flange type design, with flexible capillary tube, connected with flexible capillary tube to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	**7MF0810-**	
• SITRANS P320/P420 transmitter for absolute pressure from differential pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off	**7MF0811-**	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off	**7MF0812-**	
	■■■■■-0■■■	**■■■**
• Wetted parts Tantalum		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**K1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**K2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**K3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**K4**

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Factory certificates	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	**C11**
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	**C12**
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	**C13**
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	**C15**
Certificate of FDA-approved fill oil (to EN10204-2.2)	**C17**
Factory certificate functional safety (SIL2/3), devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	**C20**
Accessories	
Spark arrestor (for gauge and absolute pressure transmitters)	**D61**
Spark arrestor (for differential pressure and flow transmitters)	**D62**
Low-temperature version (for Silicon Oil M50 only)	**D67**
Negative pressure services	
Negative pressure service (for gauge and absolute pressure transmitters) (only for 7MF0810)	**D81**
Negative pressure service (for differential pressure transmitters)	**D83**
Extended negative pressure service (for gauge and absolute pressure transmitters) (only for 7MF0810)	**D85**
Extended negative pressure service (for differential pressure transmitters)	**D88**
General product approvals without explosion proof approvals	
Oil-and grease-free cleaned version (for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-and grease-free cleaned version (not for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)	**E87**
Sealing surface	
Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)	**M50**
Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)	**M54**
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)	**M64**
Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)	
• DN 25	**M70**
• DN 40	**M71**
• DN 50	**M72**
• DN 80	**M73**
• DN 100	**M74**
• DN 125	**M75**
Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)	
• DN 25	**M76**
• DN 40	**M77**
• DN 50	**M78**
• DN 80	**M79**
• DN 100	**M80**
• DN 125	**M81**

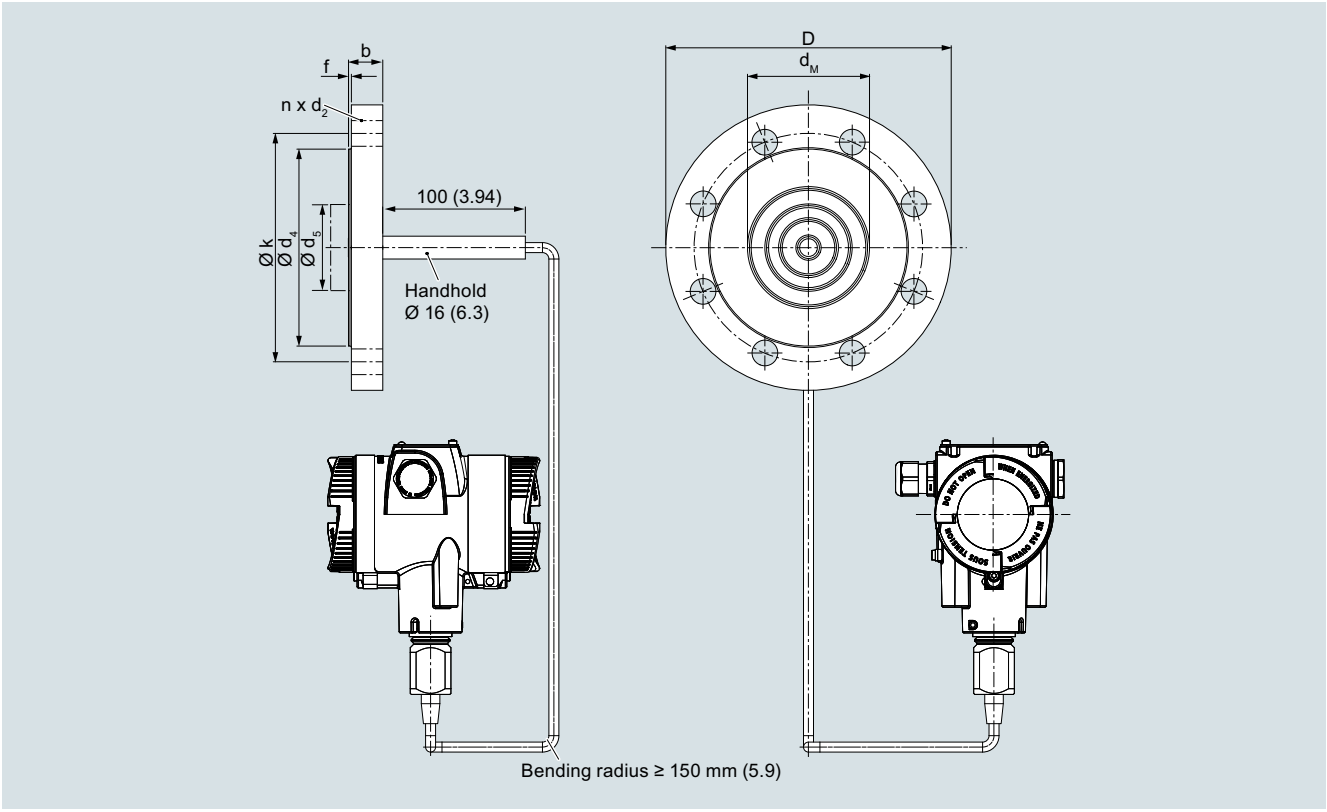
Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)	
• DN 25	**M82**
• DN 40	**M83**
• DN 50	**M84**
• DN 80	**M85**
• DN 100	**M86**
• DN 125	**M87**
Capillary connection	
For 7MF0810	
Radial capillary pipe outlet (for single-side mounting and capillary connection only)	**S01**
Single-side mounted at differential pressure transmitters at high-side	**S03**
Single-side mounted at differential pressure transmitters at low-side	**S04**
For 7MF0811	
Radial capillary pipe outlet (for single-side mounting and capillary connection only)	**S01**
For 7MF0812	
Radial capillary pipe outlet (for double-side mounting)	**S02**
Capillary coating	
PE protective tube	
1 m	**S10**
1,6 m	**S11**
2 m	**S12**
2,5 m	**S13**
3 m	**S14**
4 m	**S15**
5 m	**S16**
6 m	**S17**
7 m	**S18**
8 m	**S19**
9 m	**S20**
10 m	**S21**
11 m (only for 7MF0802)	**S22**
12 m (only for 7MF0802)	**S23**
13 m (only for 7MF0802)	**S24**
14 m (only for 7MF0802)	**S25**
15 m (only for 7MF0802)	**S26**
PTFE protective tube	
1 m	**S40**
1,6 m	**S41**
2 m	**S42**
2,5 m	**S43**
3 m	**S44**
4 m	**S45**
5 m	**S46**
6 m	**S47**
7 m	**S48**
8 m	**S49**
9 m	**S50**
10 m	**S51**
11 m (only for 7MF0802)	**S52**
12 m (only for 7MF0802)	**S53**
13 m (only for 7MF0802)	**S54**
14 m (only for 7MF0802)	**S55**
15 m (only for 7MF0802)	**S56**

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
PVC protective tube	
1 m	**S70**
1,6 m	**S71**
2 m	**S72**
2,5 m	**S73**
3 m	**S74**
4 m	**S75**
5 m	**S76**
6 m	**S77**
7 m	**S78**
8 m	**S79**
9 m	**S80**
10 m	**S81**
11 m (only for 7MF0802)	**S82**
12 m (only for 7MF0802)	**S83**
13 m (only for 7MF0802)	**S84**
14 m (only for 7MF0802)	**S85**
15 m (only for 7MF0802)	**S86**
Customer-specific tube length	
Customer-specific tube length (specify in plain text)	**Y44**
Specification of process conditions[1)]	
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

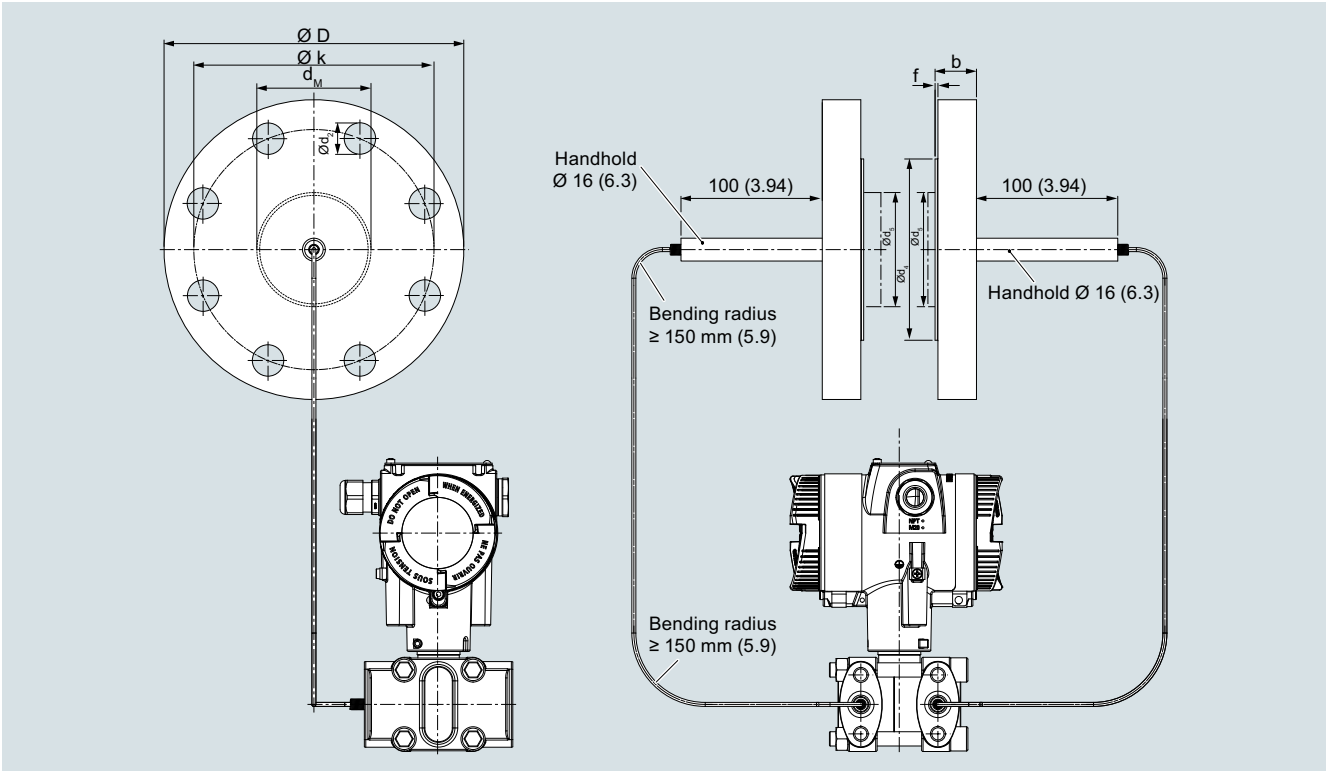
1) See also "Specification of process conditions for selection and ordering data", page 1/337.

Diaphragm seals of flange design with flexible capillary

Dimensional drawings



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P320/420 pressure transmitters for pressure, dimensions in mm (inch)



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P320/420 pressure transmitters for absolute pressure or for differential pressure and flow, dimensions in mm (inch)

Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with extension	d_M without extension	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 25	PN 10/16/25/40	18	115	14	68	24.5	22.6	27	2	85	4	0, 50, 100, 150 oder 200
	PN 63/100	24	140	18	68	24.5	22.6	27	2	100	4	
	PN 160	24	140	18	68	24.5	22.6	27	2	100	4	0, 50, 100, 150 oder 200
	PN 250	28	150	22	68	24.5	22.6	27	2	105	4	
DN 40	PN 10/16/25/40	16	150	18	88	38	30	42	2	110	4	
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

Connection to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with extension	d_M without extension	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)		inch (mm
1 inch	150	0.71 (18)	4.33 (110)	0.61 (15.6)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.08 (2)	3.13 (79.4)	4	0, 2, 3.94, 5.94 oder 7.87 (0, 50, 100, 150 oder 200)
	300	0.77 (19.5)	4.92 (125)	0.75 (19.1)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.08 (2)	3.5 (88.9)	4	
	600	0.96 (24.5)	4.92 (125)	0.75 (19.1)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.28 (7)	3.5 (88.9)	4	
	1500	1.4 (35.6)	5.91 (150)	1 (25.4)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.28 (7)	4 (101.6)	4	
1½ inch	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	
	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	
2 inch	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3 inch	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4 inch	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5 inch	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

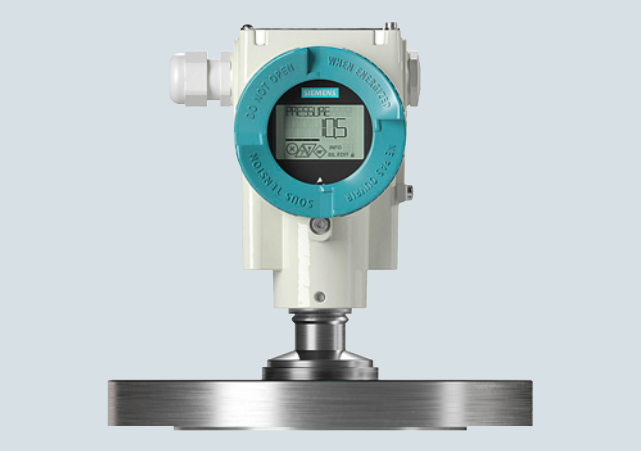
Diaphragm seals of flange design with flexible capillary

Connection to J.I.S

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with extension	d_M without extension	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)		mm (inch)
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 oder 200 (0, 2, 3.94, 5.94 oder 7.87)
	20K	16 (0,63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Internal diameter of gasket to DIN 2690
d_M: Effective diaphragm diameter

Overview



Diaphragm seals of flange design, directly fitted on a pressure transmitter for pressure

Technical specifications

Diaphragm seals (flange design) for pressure and absolute pressure, directly fitted on a transmitter

Nominal diameter	Nominal pressure
Connecting standard EN 1092-1	
• DN 25	PN 10/16/25/40/63/100/160/250
• DN 40	PN 10/16/25/40/63/100/160
• DN 50	PN 10/16/25/40/63/100
• DN 80	PN 10/16/25/40/100
• DN 100	PN 10/16/25/40
• DN 125	PN 16/40
Connecting standard ASME B16.5	
• 1 inch	Class 150/300/600/1500
• 1½ inch	Class 150/300/400/600/900/1500
• 2 inch	Class 150/300/400/600/900/1500
• 3 inch	Class 150/300/600/1500
• 4 inch	Class 150/300/400/1500
• 5 inch	Class 150/300/400
Connecting standard J.I.S.	
• DN 50	10K
• DN 80	20K
• DN 100	40K
Sealing surface	
• For stainless steel, mat. No. 1.4404/316L	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
• For the other materials	Smooth to EN 1092-1, form B2 or ASME B16.5 RFSF

Materials	
• Main body	Stainless steel, 1.4404/316L
• Wetted parts	Stainless steel, 1.4404/316L • Without coating • PTFE coating • ECTFE coating (for vacuum on request) • PFA coating Monel 400, mat. No. 2.4360 Hastelloy C276, mat. No. 2.4819 Hastelloy C4, mat. No. 2.4602 Hastelloy C22, mat No. 2.4602 Tantalum Titanium, mat. No. 3.7035 Nickel 201 Duplex 2205, mat. no. 1.4462 Stainless steel 316L, gold plated, thickness approx. 25 µm
• Capillary	Stainless steel, 1.4404/316L
• Sealing material at the transmitter connection	Copper
Maximum pressure	See above and the technical data of the transmitter
Tube length	• Without tube • 50 mm (1.97 inch) • 100 mm (3.94 inch) • 150 mm (5.91 inch) • 200 mm (7.87 inch)
Capillary	
• Length	Max. 10 m (32.8 ft), longer lengths on request
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
Filling liquid	• Silicone oil M5 • Silicone oil M50 • High-temperature oil • Halocarbon oil (for measuring O_2) • Food oil (FDA listed)
Max. recommended temperature of medium	170 °C (338 °F)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal. More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals.
Weight	Approx. 4 kg (8.82 lb)
Certificate and approvals	
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

1

Diaphragm seals of flange design mounted directly on transmitter

Selection and Ordering data		Article No.	Order code
Diaphragm seal			
Flange type design, directly mounted to a			
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off		7MF0810-	
		■■■■■-0■■	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Nominal diameter	**Nominal pressure**		
Connecting standard EN 1092-1			
DN 25	PN 10/16/25/40	0BD	
	PN 63/100	0BF	
	PN 160	0BG	
	PN 250	0BH	
DN 40	PN 10/16/25/40	0DD	
	PN 63/100	0DF	
	PN 160	0DG	
DN 50	PN 10/16/25/40	0ED	
	PN 63	0EE	
	PN 100	0EF	
DN 80	PN 10/16/25/40	0GD	
	PN 100	0GF	
DN 100	PN 10/16	0HB	
	PN 25/40	0HD	
DN 125	PN 16	0JB	
	PN 40	0JD	
Connecting standard ASME B16.5			
1 inch	class 150	1KL	
	class 300	1KM	
	class 600	1KN	
	class 1500	1KP	
1½ inch	class 150	1LA	
	class 300	1LB	
	class 400/600	1LD	
	class 900/1500	1LF	
2 inch	class 150	1MA	
	class 300	1MB	
	class 400/600	1MD	
	class 900/1500	1MF	
3 inch	class 150	1PA	
	class 300	1PB	
	class 600	1PD	
	class 1500	1PF	
4 inch	class 150	1QA	
	class 300	1QB	
	class 400	1QC	
	class 1500	1QF	
5 inch	class 150	1RA	
	class 300	1RB	
	class 400	1RC	
Connecting standard J.I.S.			
DN 50	10K	2ES	
	20K	2ET	
	40K	2EU	
DN 80	10K	2GS	
	20K	2GT	
	40K	2GU	
DN 100	10K	2HS	
	20K	2HT	
	40K	2HU	
Other version Add Order code and plain text		9AA	H1Y

Selection and Ordering data	Article No.	Order code
Diaphragm seal		
Flange type design, directly mounted to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	7MF0810-	
	■■■■■-0■■	■■■
Transmitter connection		
Without capillary tube, direct mount straight connection (for gauge pressure)	00	
Without capillary tube, direct mount connection via 90°-bow (for gauge pressure)	01	
Filling liquid		
Silicone oil M50	B	
High-temperature oil	C	
Silicone oil M5	A	
Food-grade oil (FDA listed)	E	
Halocarbon oil	D	
Other version Add Order code and plain text	Z	P1Y
Wetted parts materials		
Stainless steel 316L		
• Without coating	A	
• With PFA coating	D	
• With PTFE coating	E0	
• With ECTFE coating	F	
Monel 400, 2.4360	G	
Hastelloy C276, 2.4819	J	
Tantalum	K	
Titanium, 3.7035	L0	
Nickel 201	M0	
Diaphragm Duplex, 1.4462	Q	
Diaphragm plus flange Duplex, 1.4462	R	
Stainless steel 316L with gold coating	S0	
Hastelloy C4, 2.4610	U0	
Hastelloy C22, 2.4602	V0	
Other version Add Order code and plain text	Z8	Q1Y
Extension length		
• without	0	
• 50 mm (2")	1	
• 100 mm (4")	2	
• 150 mm (6")	3	
• 200 mm (8")	4	
• 250 mm (10")	5	
Other version Add Order code and plain text	Z8	Q1Y

Selection and Ordering data	Article No.	Order code
Diaphragm seal		
Flange type design, directly mounted to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	**7MF0810-**	
	-0	
Customer-specific extension length		
• Wetted parts stainless steel without coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**A1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**A2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**A3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**A4**
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		**A5**
• Wetted parts stainless steel with ECTFE coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**F1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**F2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**F3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**F4**
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		**F5**
• Wetted parts stainless steel with PFA coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**D1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**D2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**D3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**D4**
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		**D5**
• Wetted parts Monel 400		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**G1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**G2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**G3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**G4**

Selection and Ordering data	Article No.	Order code
Diaphragm seal		
Flange type design, directly mounted to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	**7MF0810-**	
	-0	
• Wetted parts Hastelloy C276		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**J1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**J2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**J3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**J4**
• Wetted parts Tantalum		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**K1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**K2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**K3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**K4**

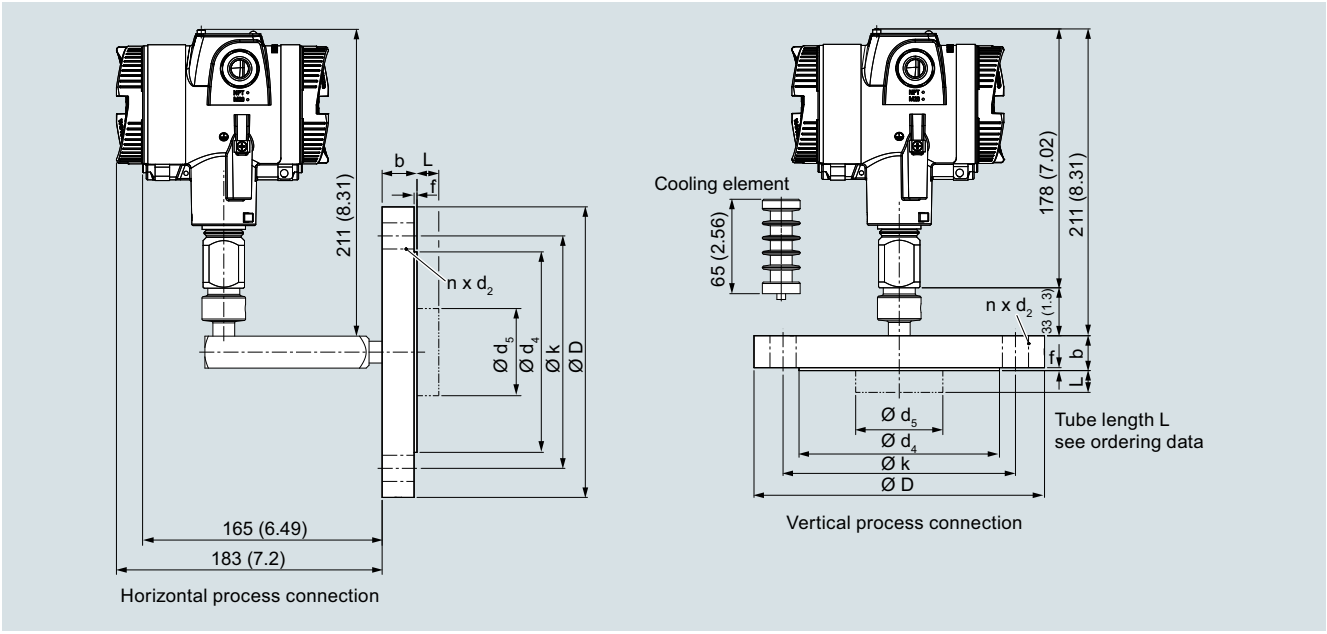
Diaphragm seals of flange design mounted directly on transmitter

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Factory certificates	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	**C11**
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	**C12**
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	**C13**
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	**C15**
Certificate of FDA-approved fill oil (to EN10204-2.2)	**C17**
Factory certificate functional safety (SIL2/3), devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	**C20**
Accessories	
Spark arrestor (for gauge and absolute pressure transmitters)	**D61**
Low-temperature version (for Silicon Oil M50 only)	**D67**
Negative pressure services	
Negative pressure service (for gauge and absolute pressure transmitters)	**D81**
Extended negative pressure service (for gauge and absolute pressure transmitters) (only for 7MF0810)	**D85**
General product approvals without explosion proof approvals	
Oil-and grease-free cleaned version (for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-and grease-free cleaned version (not for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)	**E87**
Sealing surface	
Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)	**M50**
Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)	**M54**
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)	**M64**
Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)	
• DN 25	**M70**
• DN 40	**M71**
• DN 50	**M72**
• DN 80	**M73**
• DN 100	**M74**
• DN 125	**M75**
Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)	
• DN 25	**M76**
• DN 40	**M77**
• DN 50	**M78**
• DN 80	**M79**
• DN 100	**M80**
• DN 125	**M81**

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)	
• DN 25	**M82**
• DN 40	**M83**
• DN 50	**M84**
• DN 80	**M85**
• DN 100	**M86**
• DN 125	**M87**
Capillary connection	
Elongated pipe, 150 mm instead of 100 mm, max. medium temperature 300 °C (572 °F), observe the max. permissible media temperature of the fill liquid.	**S05**
Elongated pipe, 200 mm instead of 100 mm, max. medium temperature 300 °C (572 °F), observe the max. permissible media temperature of the fill liquid.	**S06**
Elongated pipe elbow, 200 mm instead of 130 mm, max. medium temperature 300 °C (572 °F), observe the max. permissible media temperature of the fill liquid.	**S07**
Cooling element, max. medium temperature 300 °C (572 °F), observe the max. permissible media temperature of the fill liquid.	**S08**
Customer-specific tube length	
Customer-specific tube length (specify in plain text)	**Y44**
Specification of process conditions[1)]	
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

1) See also "Specification of process conditions for selection and ordering data", page 1/337.

Dimensional drawings



Diaphragm seals of flange design, direct connection to a SITRANS P320/420 pressure transmitter (process connection vertical (top) and horizontal (bottom)), dimensions in mm (inch)

Diaphragm seals of flange design mounted directly on transmitter

Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with extension	d_M without extension	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 25	PN 10/16/25/40	18	115	14	68	24.5	22.6	27	2	85	4	0, 50, 100, 150 oder 200
	PN 63/100	24	140	18	68	24.5	22.6	27	2	100	4	
	PN 160	24	140	18	68	24.5	22.6	27	2	100	4	
	PN 250	28	150	22	68	24.5	22.6	27	2	105	4	
DN 40	PN 10/16/25/40	16	150	18	88	38	30	42	2	110	4	
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

Connection to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with extension	d_M without extension	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)		inch (mm)
1 inch	150	0.71 (18)	4.33 (110)	0.61 (15.6)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.08 (2)	3.13 (79.4)	4	0, 2, 3.94, 5.94 oder 7.87 (0, 50, 100, 150 oder 200)
	300	0.77 (19.5)	4.92 (125)	0.75 (19.1)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.08 (2)	3.5 (88.9)	4	
	600	0.96 (24.5)	4.92 (125)	0.75 (19.1)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.28 (7)	3.5 (88.9)	4	
	1500	1.4 (35.6)	5.91 (150)	1 (25.4)	2 (50.8)	0.96 (24.5)	0.89 (22.6)	1.18 (30)	0.28 (7)	4 (101.6)	4	
1½ inch	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	
	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	
2 inch	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3 inch	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4 inch	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5 inch	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

Connection to J.I.S

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with extension	d_M without extension	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)		mm (inch)
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 oder 200 (0, 2, 3.94, 5.94 oder 7.87)
	20K	16 (0,63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Internal diameter of gasket to DIN 2690
d_M: Effective diaphragm diameter

Diaphragm seals of flange design mounted directly and with capillary

Overview

Diaphragm seal of flange design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

Technical specifications

Diaphragm seals of screwed design for pressure transmitters for differential pressure, fixed connection and with flexible capillary

Nominal diameter	Nominal pressure
Connecting standard EN 1092-1	
• DN 40	PN 10/16/25/40/63/100/160
• DN 50	PN 10/16/25/40/63/100
• DN 80	PN 10/16/25/40/100
• DN 100	PN 10/16/25/40
• DN 125	PN 16/40
Connecting standard ASME B16.5	
• 1½ inch	Class 150/300/400/600/900/1500
• 2 inch	Class 150/300/400/600/900/1500
• 3 inch	Class 150/300/600/1500
• 4 inch	Class 150/300/400/1500
• 5 inch	Class 150/300/400
Connecting standard J.I.S.	
• DN 50	10K
• DN 80	20K
• DN 100	40K
Sealing surface	
• For stainless steel, mat. No. 1.4404/316L	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
• For the other materials	To EN 1092-1, form B2 or ASME B16.5 RFSF

Materials	
• Main body	Stainless steel, 1.4404/316L
• Wetted parts	Stainless steel, 1.4404/316L
	• Without coating
	• PTFE coating
	• ECTFE coating (for vacuum on request)
	• PFA coating
	Monel 400, mat. No. 2.4360
	Hastelloy C276, mat. No. 2.4819
	Hastelloy C4, mat. No. 2.4602
	Hastelloy C22, W.-Nr. 2.4602
	Tantalum
	Titanium, W.-Nr. 3.7035
	Nickel 201
	Duplex 2205, mat. no. 1.4462
	Stainless steel 316L, gold plated, thickness approx. 25 µm
• Capillary	Stainless steel, mat. No. 1.4571/316Ti
• Sheath	Spiral protective tube made of stainless steel, mat. No. 1.4404/316L
Sealing material in the process flanges	
• For pressure transmitters, absolute pressure transmitters and low-pressure applications	Copper
• For other applications	Viton
Maximum pressure	See above and the technical data of the pressure transmitter
Tube length	Without tube
	50 mm (1.97 inch)
	100 mm (3.94 inch)
	150 mm (5.91 inch)
	200 mm (7.87 inch)
Capillary	
• Length	Max. 10 m (32.8 ft), longer lengths on request
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
Filling liquid	Silicone oil M5
	Silicone oil M50
	High-temperature oil
	Halocarbon oil (for measuring O_2)
	Food oil (FDA listed)
Max. recommended temperature of medium	170 °C (338 °F)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal
	More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals
Weight	Approx. 4 kg (8.82 lb)
Certificate and approvals	
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Selection and Ordering data		Article No.	Order code
Diaphragm seal			
Flange type design, direct connected at high-side and with flexible capillary tube at low-side to			
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately Scope of delivery: 2 off		**7MF0813-**	
		-0	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Nominal diameter	**Nominal pressure**		
Connecting standard EN 1092-1			
DN 40	PN 10/16/25/40	**0DD**	
	PN 63/100	**0DF**	
	PN 160	**0DG**	
DN 50	PN 10/16/25/40	**0ED**	
	PN 63	**0EE**	
	PN 100	**0EF**	
DN 80	PN 10/16/25/40	**0GD**	
	PN 100	**0GF**	
DN 100	PN 10/16	**0HB**	
	PN 25/40	**0HD**	
DN 125	PN 16	**0JB**	
	PN 40	**0JD**	
Connecting standard ASME B16.5			
1½ inch	class 150	**1LA**	
	class 300	**1LB**	
	class 400/600	**1LD**	
	class 900/1500	**1LF**	
2 inch	class 150	**1MA**	
	class 300	**1MB**	
	class 400/600	**1MD**	
	class 900/1500	**1MF**	
3 inch	class 150	**1PA**	
	class 300	**1PB**	
	class 600	**1PD**	
	class 1500	**1PF**	
4 inch	class 150	**1QA**	
	class 300	**1QB**	
	class 400	**1QC**	
	class 1500	**1QF**	
5 inch	class 150	**1RA**	
	class 300	**1RB**	
	class 400	**1RC**	
Connecting standard J.I.S.			
DN 50	10K	**2ES**	
	20K	**2ET**	
	40K	**2EU**	
DN 80	10K	**2GS**	
	20K	**2GT**	
	40K	**2GU**	
DN 100	10K	**2HS**	
	20K	**2HT**	
	40K	**2HU**	
Other version Add Order code and plain text		**9AA**	**H1Y**

Selection and Ordering data	Article No.	Order code
Diaphragm seal		
Flange type design, direct connected at high-side and with flexible capillary tube at low-side to		
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately Scope of delivery: 2 off	**7MF0813-**	
	-0	
Length of capillary tube at low-side		
1 m	**10**	
1,6 m	**11**	
2 m	**12**	
2,5 m	**13**	
3 m	**14**	
4 m	**15**	
5 m	**16**	
6 m	**17**	
7 m	**18**	
8 m	**20**	
9 m	**21**	
10 m	**22**	
Other version Add Order code and plain text	**98**	**L1Y**
Filling liquid		
Silicone oil M50	**B**	
High-temperature oil	**C**	
Silicone oil M5	**A**	
Food-grade oil (FDA listed)	**E**	
Halocarbon oil	**D**	
Other version Add Order code and plain text	**Z**	**P1Y**

1

Diaphragm seals of flange design mounted directly and with capillary

Selection and Ordering data	Article No.	Order code
Diaphragm seal		
Flange type design, direct connected at high-side and with flexible capillary tube at low-side to		
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately Scope of delivery: 2 off	**7MF0813-**	
	-0	
Wetted parts materials		
Stainless steel 316L		
• Without coating		**A**
• With PFA coating		**D**
• With PTFE coating		**E 0**
• With ECTFFE coating		**F**
Monel 400, 2.4360		**G**
Hastelloy C276, 2.4819		**J**
Tantalum		**K**
Titanium, 3.7035		**L 0**
Nickel 201		**M 0**
Diaphragm Duplex, 1.4462		**Q**
Diaphragm plus flange Duplex, 1.4462		**R**
Stainless steel 316L with gold coating		**S 0**
Hastelloy C4, 2.4610		**U 0**
Hastelloy C22, 2.4602		**V 0**
Other version Add Order code and plain text		**Z 8 Q 1 Y**
Extension length		
• without		**0**
• 50 mm (2")		**1**
• 100 mm (4")		**2**
• 150 mm (6")		**3**
• 200 mm (8")		**4**
• 250 mm (10")		**5**
Other version Add Order code and plain text		**Z 8 Q 1 Y**
Customer-specific extension length		
• Wetted parts stainless steel without coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**A 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**A 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**A 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**A 4**
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		**A 5**
• Wetted parts stainless steel with ECTFE coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**F 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**F 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**F 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**F 4**
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		**F 5**

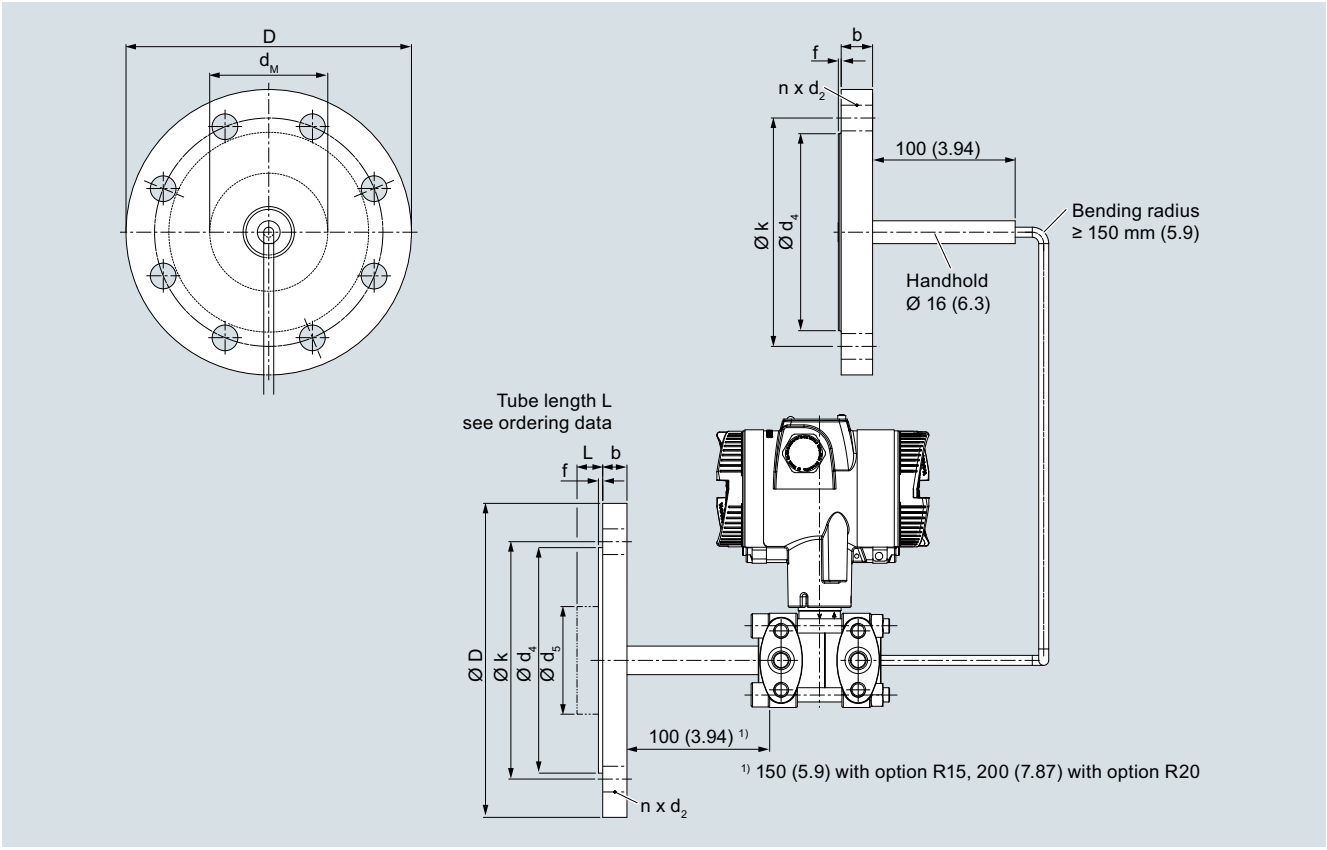
Selection and Ordering data	Article No.	Order code
Diaphragm seal		
Flange type design, direct connected at high-side and with flexible capillary tube at low-side to		
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately Scope of delivery: 2 off	**7MF0813-**	
	-0	
• Wetted parts stainless steel with PFA coating		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**D 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**D 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**D 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**D 4**
201 ... 250 mm (7.91 ... 9.84") / 250 mm (9.84")		**D 5**
• Wetted parts Monel 400		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**G 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**G 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**G 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**G 4**
• Wetted parts Hastelloy C276		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**J 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**J 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**J 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**J 4**
• Wetted parts Tantalum		
Range / Standard length		
20 ... 50 mm (0.79 ... 1.97") / 50 mm (1.97")		**K 1**
51 ... 100 mm (2.01 ... 3.94") / 100 mm (3.94")		**K 2**
101 ... 150 mm (3.98 ... 5.91") / 150 mm (5.91")		**K 3**
151 ... 200 mm (5.94 ... 7.87") / 200 mm (7.87")		**K 4**

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Factory certificates	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	**C11**
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	**C12**
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	**C13**
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	**C15**
Certificate of FDA-approved fill oil (to EN10204-2.2)	**C17**
Factory certificate functional safety (SIL2/3), devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	**C20**
Accessories	
Spark arrestor (for differential pressure and level transmitters)	**D62**
Low-temperature version (for Silicon Oil M50 only)	**D67**
Negative pressure services	
Negative pressure service (for differential pressure transmitters)	**D83**
Extended negative pressure service (for differential pressure transmitters)	**D88**
General product approvals without explosion proof approvals	
Oil-and grease-free cleaned version (for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-and grease-free cleaned version (not for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)	**E87**
Sealing surface	
Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)	**M50**
Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)	**M54**
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)	**M64**
Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)	
• DN 25	**M70**
• DN 40	**M71**
• DN 50	**M72**
• DN 80	**M73**
• DN 100	**M74**
• DN 125	**M75**
Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)	
• DN 25	**M76**
• DN 40	**M77**
• DN 50	**M78**
• DN 80	**M79**
• DN 100	**M80**
• DN 125	**M81**
Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)	
• DN 25	**M82**
• DN 40	**M83**
• DN 50	**M84**
• DN 80	**M85**
• DN 100	**M86**
• DN 125	**M87**

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Capillary coating	
PE protective tube	
1 m	**S10**
1,6 m	**S11**
2 m	**S12**
2,5 m	**S13**
3 m	**S14**
4 m	**S15**
5 m	**S16**
6 m	**S17**
7 m	**S18**
8 m	**S19**
9 m	**S20**
10 m	**S21**
PTFE protective tube	
1 m	**S40**
1,6 m	**S41**
2 m	**S42**
2,5 m	**S43**
3 m	**S44**
4 m	**S45**
5 m	**S46**
6 m	**S47**
7 m	**S48**
8 m	**S49**
9 m	**S50**
10 m	**S51**
PVC protective tube	
1 m	**S70**
1,6 m	**S71**
2 m	**S72**
2,5 m	**S73**
3 m	**S74**
4 m	**S75**
5 m	**S76**
6 m	**S77**
7 m	**S78**
8 m	**S79**
9 m	**S80**
10 m	**S81**
Customer-specific tube length	
Customer-specific tube length (specify in plain text)	**Y44**
Specification of process conditions[1)]	
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

1) See also "Specification of process conditions for selection and ordering data", page 1/337.

Dimensional drawings



Diaphragm seals of screwed design with flexible capillary, fixed connection, for connection to a SITRANS P320/420 pressure transmitter for differential pressure, dimensions in mm (inch)

Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with extension	d_M without extension	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 40	PN 10/16/25/40	16	150	18	88	38	30	42	2	110	4	0, 50, 100, 150 oder 200
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

Connection to ASME B16.5

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with extension	d_M without extension	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)		inch (mm)
1½ inch	150	0.63 (15.9)	4.92 (125)	0.63 (15.9)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	3.87 (98.4)	4	0, 2, 3.94, 5.94 oder 7.87 (0, 50, 100, 150 oder 200)
	300	0.75 (19.1)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.08 (2)	4.5 (114.3)	4	
	400/600	0.88 (22.3)	6.10 (155)	0.87 (22.2)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.5 (114.3)	4	
	900/1500	1.25 (31.8)	7.09 (180)	1.13 (28.6)	2.87 (73)	1.5 (38)	1.18 (30)	1.42 (36)	0.28 (7)	4.87 (123.8)	4	
2 inch	150	0.69 (17.5)	5.91 (150)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	4.75 (120.7)	4	
	300	0.81 (20.7)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.08 (2)	5 (127)	8	
	400/600	1.00 (25.4)	6.5 (165)	0.75 (19.1)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	5 (127)	8	
	900/1500	1.5 (38.1)	8.46 (215)	1.00 (25.4)	3.63 (92.1)	1.9 (48.3)	1.57 (40)	2.01 (51)	0.28 (7)	6.5 (165.1)	8	
3 inch	150	0.88 (22.3)	7.48 (190)	0.75 (19.1)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6 (152.4)	4	
	300	1.06 (27)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.08 (2)	6.63 (168.3)	8	
	600	1.23 (31.8)	8.27 (210)	0.87 (22.2)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	6.63 (168.3)	8	
	1500	1.88 (47.7)	10.43 (265)	1.25 (31.8)	5 (127)	3 (76)	2.65 (65)	3.35 (85)	0.28 (7)	8 (203.2)	8	
4 inch	150	0.88 (22.3)	9.06 (230)	0.75 (19.1)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.5 (190.5)	8	
	300	1.19 (30.2)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.08 (2)	7.87 (200)	8	
	400	1.38 (35)	10.04 (255)	0.87 (22.2)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	7.87 (200)	8	
	1500	2.13 (54)	12.20 (310)	1.37 (34.9)	6.19 (157.2)	3.69 (94)	3.35 (85)	3.35 (85)	0.28 (7)	9.5 (241.3)	8	
5 inch	150	0.88 (22.3)	10.04 (255)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	8.5 (215.9)	8	
	300	1.31 (33.4)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.08 (2)	9.25 (235)	8	
	400	1.50 (38.1)	11.02 (280)	0.87 (22.2)	7.31 (185.7)	5 (127)	4.57 (116)	4.57 (116)	0.28 (7)	9.25 (235)	8	

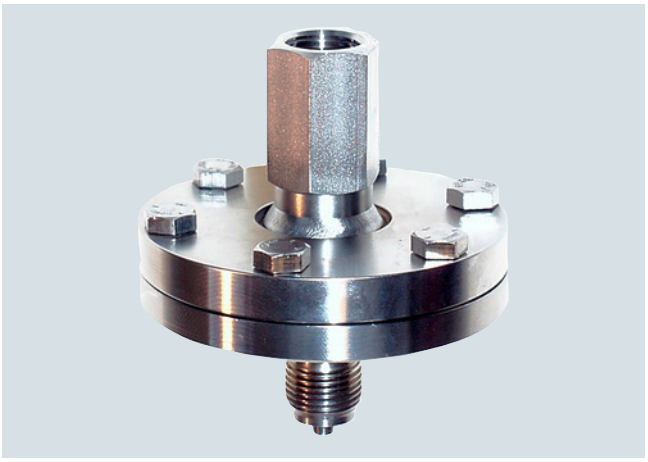
Diaphragm seals of flange design mounted directly and with capillary

Connection to J.I.S

Nominal diameter	Nominal pressure	b	D	d_2	d_4	d_5	d_M with extension	d_M without extension	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)		mm (inch)
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 oder 200 (0, 2, 3.94, 5.94 oder 7.87)
	20K	16 (0,63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Internal diameter of gasket to DIN 2690
d_M: Effective diaphragm diameter

Overview



Diaphragm seal, screwed gland design with inside diaphragm for gauge, absolute and differential pressure for direct mounting

Process connection, open measuring flange

Technical specifications

Diaphragm seal, screwed gland with inside diaphragm	
Process connection	Nominal pressure
• Open flange EN1092-1	
- DN 15	PN 10/16/25/40/63/100/160/250
- DN 20	PN 10/16/25/40
- DN 25	PN 10/16/25/40/63/100/160/250
• Open flange ASME B16.5	
- ½ inch, ¾ inch, 1 inch	Class 150/300/600/1500
• Thread to EN 837-1	
- G¼"B, G½"B, G¾"B, G1"B	PN 100/250
• Thread ASME B1.20.1	
- ¼" NPT-M, ¼" NPT-F	Class 1500/3675
- ½" NPT-M, ½" NPT-F	Class 1500/3675
- ¾" NPT-M, ¾" NPT-F	Class 1500/3675
- 1" NPT-M, 1" NPT-F	Class 1500/3675
Sealing surface for open measurement flange	
• For stainless steel, mat. no. 1.4404/316L	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
Materials	
• Lower section (in the case of process connection thread)	Stainless steel, Mat. no. 1.4404/316L
• Diaphragm	Stainless steel, Mat. no. 1.4404/316L
	• No coating
	• With PTFE coating
	Monel 400, mat. no. 2.4360
	Hastelloy C276, mat. no. 2.4819
	Hastelloy C4, mat. no. 2.4602
	Tantal
	Stainless steel 316L, gold plated, thickness approx. 25 µm
• Top section (process connection in the case of an open measurement flange)	Stainless steel, mat. no. 1.4404/316L
• Capillary	Stainless steel 1.4404/316L
• Sealing material on the process connection	Viton or copper (in the case of vacuum-free version)
• Sealing material between top and bottom section	Viton (FKM) (standard) Teflon (PTFE) metal spring ring (silver-coated)
Capillary	
• Length	Max. 10 m (32.8 ft)
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
• Sheath	Stainless steel protective tube, mat. No. 1.4301/304
Filling liquid	• Silicone oil M5
	• Silicone oil M50
	• High-temperature oil
	• Halocarbon oil (for measuring O_2)
	• Food oil (FDA listed)
Max. recommended temperature of medium	170 °C (338 °F)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal More information can be found in the technical specifications of the pressure transmitters and in the section "Technical data of filling liquid" in the introduction to the remote seals
Weight	Approx. 1.5 kg (3.3 lb)
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

1

Diaphragm seal, screwed design, directly mounted or/and with capillary

Selection and Ordering data	Article No.	Order code
Diaphragm seal threaded design		
With inside diaphragm, directly connected or connected via flexible capillary tube to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off ↗	7MF0840-	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off ↗	7MF0842-	
	■■■■■-0■■0	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Nominal diameter **Nominal pressure**		
Open flange, connecting standard EN 1092-1		
DN 15 PN 10/16/25/40	0AD	
PN 63/100	0AF	
PN 160	0AG	
PN 250	0AH	
DN 20 PN 10/16/25/40	0AM	
DN 25 PN 10/16/25/40	0BD	
PN 63/100	0BF	
PN 160	0BG	
PN 250	0BH	
Open flange, connecting standard ASME B16.5		
½ inch class 150	1KA	
class 300	1KB	
class 600	1KC	
class 1500	1KD	
¾ inch class 150	1KF	
class 300	1KG	
class 600	1KH	
class 1500	1KJ	
1 inch class 150	1KL	
class 300	1KM	
class 600	1KN	
class 1500	1KP	
Process connection thread EN 837-1		
G¼"B PN 100	3SB	
G¼"B PN 250	3SC	
G½"B PN 100	3SF	
G½"B PN 250	3SG	
G¾"B PN 100	3SK	
G¾"B PN 250	3SL	
G1"B PN 100	3SP	
G1"B PN 250	3SQ	
Process connection thread ASME B1.20.1		
¼"-NPT-M Class 1500	5TA	
¼"-NPT-M Class 3675	5TB	
¼"-NPT-F Class 1500	5TC	
¼"-NPT-F Class 3675	5TD	
½"-NPT-M Class 1500	5TE	
½"-NPT-M Class 3675	5TF	
½"-NPT-F Class 1500	5TG	
½"-NPT-F Class 3675	5TH	
¾"-NPT-M Class 1500	5TJ	
¾"-NPT-M Class 3675	5TK	
¾"-NPT-F Class 1500	5TL	
¾"-NPT-F Class 3675	5TM	
1"-NPT-M Class 1500	5TN	
1"-NPT-M Class 3675	5TP	
1"-NPT-F Class 1500	5TQ	
1"-NPT-F Class 3675	5TR	
Other version Add Order code and plain text	9AA	H1Y

Selection and Ordering data	Article No.	Order code
Diaphragm seal threaded design		
With inside diaphragm, directly connected or connected via flexible capillary tube to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	7MF0840-	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off	7MF0842-	
	■■■■■-0■■0	■■■
Transmitter connection		
Without capillary tube, direct mount straight connection (for gauge pressure)	00	
Connection via capillary tube Length of capillary		
1 m	10	
1,6 m	11	
2 m	12	
2,5 m	13	
3 m	14	
4 m	15	
5 m	16	
6 m	17	
7 m	18	
8 m	20	
9 m	21	
10 m	22	
Other version Add Order code and plain text	98	L1Y
Filling liquid		
Silicone oil M50	B	
High-temperature oil	C	
Silicone oil M5	A	
Food-grade oil (FDA listed)	E	
Halocarbon oil	D	
Other version Add Order code and plain text	Z	P1Y
Wetted parts materials		
Stainless steel 316L without coating	A	
Stainless steel 316L with PTFE-coating	E	
Monel 400, 2.4360	G	
Hastelloy C276, 2.4819	J	
Tantalum	K	
Stainless steel 316L with gold coating	S	
Hastelloy C4, 2.4610	U	
Other version Add Order code and plain text	Z	Q1Y

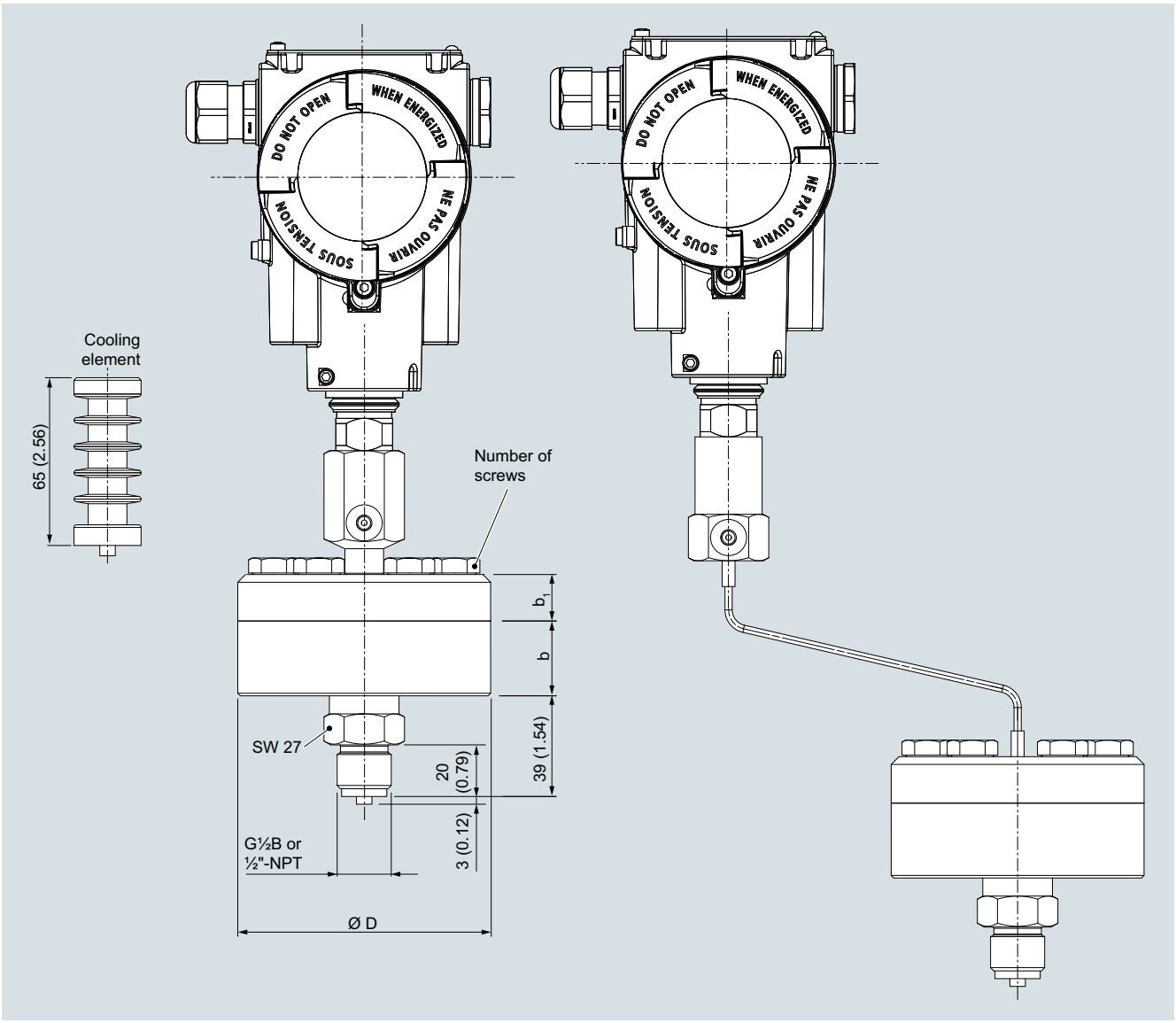
Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Factory certificates	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	**C11**
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	**C12**
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	**C13**
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	**C15**
Certificate of FDA-approved fill oil (to EN10204-2.2)	**C17**
Factory certificate functional safety (SIL2/3), devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	**C20**
Accessories	
Low-temperature version (for Silicon Oil M50 only)	**D67**
Flushing port ¼"-18 NPT unsealed	**D70**
Flushing port ¼"-18 NPT sealed with stainless steel plug	**D71**
Sealing material between upper and lower enclosure PTFE (instead of FKM viton)	**D75**
Sealing material between upper and lower enclosure metal C-circlip (instead of FKM viton)	**D76**
PTFE coating for lower enclosure (only for G½B PN 100, DN 25 PN 10 ... 40, 1 inch Class 150/300)	**D77**
Negative pressure services	
Negative pressure service (for gauge and absolute pressure transmitters)	**D81**
Negative pressure service (for differential pressure transmitters)	**D83**
Extended negative pressure service (for gauge and absolute pressure transmitters)	**D85**
Extended negative pressure service (for differential pressure transmitters)	**D88**
General product approvals without explosion proof approvals	
Oil-and grease-free cleaned version (for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-and grease-free cleaned version (not for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)	**E87**
Capillary connection (only for 7MF0840)	
Single-side mounted at differential pressure transmitters at high-side	**S03**
Single-side mounted at differential pressure transmitters at low-side	**S04**
Cooling element	**S08**

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Capillary coating	
PE protective tube	
1 m	**S10**
1,6 m	**S11**
2 m	**S12**
2,5 m	**S13**
3 m	**S14**
4 m	**S15**
5 m	**S16**
6 m	**S17**
7 m	**S18**
8 m	**S19**
9 m	**S20**
10 m	**S21**
PTFE protective tube	
1 m	**S40**
1,6 m	**S41**
2 m	**S42**
2,5 m	**S43**
3 m	**S44**
4 m	**S45**
5 m	**S46**
6 m	**S47**
7 m	**S48**
8 m	**S49**
9 m	**S50**
10 m	**S51**
PVC protective tube	
1 m	**S70**
1,6 m	**S71**
2 m	**S72**
2,5 m	**S73**
3 m	**S74**
4 m	**S75**
5 m	**S76**
6 m	**S77**
7 m	**S78**
8 m	**S79**
9 m	**S80**
10 m	**S81**
Customer-specific tube length	
Customer-specific tube length (specify in plain text)	**Y44**
Specification of process conditions[1)]	
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

[1)] See also "Specification of process conditions for selection and ordering data", page 1/337.

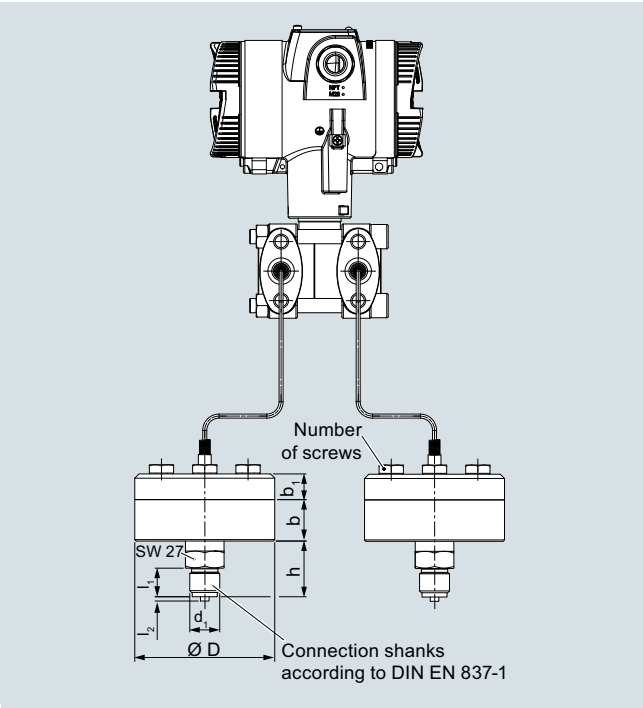
Diaphragm seal, screwed design, directly mounted or/and with capillary

Dimensional drawings



Diaphragm seal, screwed gland with inside diaphragm, for gauge and absolute pressure, direct and attached directly to the transmitter with with capillaries, dimensions in mm (inch)

Range	D mm	b mm	b_1 mm	Number of screws
up to 100 bar	98	14	16	6
up to 250 bar	98	14	20	12

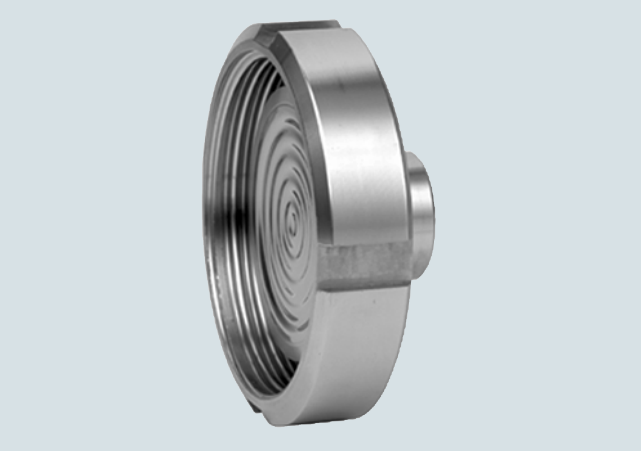


Diaphragm seal, screwed gland with inside diaphragm, for differential pressure, direct and attached directly to the transmitter with with capillaries, dimensions in mm (inch)

Nominal diameter	Nominal pressure	D mm	d_4 mm	k mm	M	Number of holes	b mm	b_1 mm	f mm
DN 25	PN 10/16/25/40	115	68	85	M12	4	26	12	2
1 inch	150 lb/sq.in	110	50.8	79.4	M12	4	32	12	2
1 inch	300 lb/sq.in	125	50.8	88.9	M16	4	32	12	2

Quick-release diaphragm seals

Overview



Quick-release diaphragm seals, to DIN 11851 with slotted union nut

Quick-release diaphragm seals, with clamp connection

Quick-release diaphragm seals are available for the following SITRANS P pressure transmitter series:

- For pressure: P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
- For differential pressure and flow: P500, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
- The quick-release remote seals are common designs in the food industry. Their design means that the medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismounting is possible for cleaning.

Technical specifications

Quick-release diaphragm seal	
Connection, nominal diameter	Nominal pressure
• Standard to DIN 11851 with nut	
- DN 25/32/40	PN 40
- DN 50/65/80	PN 25
• Standard to DIN 11851 with thread	
- DN 25/32/40	PN 40
- DN 50/65/80	PN 25
• Standard clamp ISO 2852	
- DN 25/38/51	PN 16
- DN 63.5/76.1	PN 10
• Standard clamp DIN 32676, row C Tri-clamp	
- 1 inch, 1½ inch	PN 25
- 2 inch, 2½ inch	PN 16
- 3 inch	PN 10
• Standard clamp DIN 32676, row A metric	
- DN 25/32/40	PN 25
- DN 50	PN 16
- DN 65	PN 10
• Varivent	
- DN 25/32/40/50	PN 25
• DRD-flange	
- DN 50	PN 40
Sealing surface	
• For stainless steel, mat. No. 1.4404/316L	To EN 1092-1, form B1 or ASME B 16.5RF 125 ... 250 AA
• For the other materials	To EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel 316L
• Wetted parts	Stainless steel 316L
• Capillary	Stainless steel, mat. No. 1.4571/316Ti
• Sheath	Spiral protective tube made of stainless steel, mat. No. 1.4301/316
Maximum pressure	See above and the technical data of the pressure transmitter
Tube length	Without tube
Capillary	
• Length	Max. 10 m (32.8 ft), longer lengths on request
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
• Sheath	Spiral protective tube made of stainless steel, mat. No. 1.4404/316L
Filling liquid	Food oil (FDA listed)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals
Weight	Approx. 4 kg (8.82 lb)
Certificates and approvals	
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
EHEDG	Complies with EHEDG recommendations

Selection and Ordering data		Article No.	Order code
Quick release diaphragm seal			
Flange type design, with flexible capillary tube or directly connected to a			
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off ↗		7MF0830-	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately Scope of delivery: 1 off ↗		7MF0832-	
		■■■■■-0■A0	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Nominal diameter	**Nominal pressure**		
Connection standard DIN 11851 with nut			
DN 25	PN 40	0BM	
DN 32	PN 40	0CD	
DN 40	PN 40	0DM	
DN 50	PN 25	0EK	
DN 65	PN 25	0FL	
DN 80	PN 25	0GK	
Connection standard DIN 11851 with thread			
DN 25	PN 40	1BM	
DN 32	PN 40	1CD	
DN 40	PN 40	1DM	
DN 50	PN 25	1EK	
DN 65	PN 25	1FL	
DN 80	PN 25	1GK	
Connection standard Clamp ISO 2852			
DN 25	PN 16	2BK	
DN 38	PN 16	2CQ	
DN 51	PN 16	2FH	
DN 63.5	PN 10	2FJ	
DN 76.1	PN 10	2GJ	
Connection standard Clamp DIN 32676, row C Tri-clamp			
DN 1"	PN 25	3KV	
DN 1½"	PN 25	3LV	
DN 2"	PN 16	3MV	
DN 2½"	PN 16	3NV	
DN 3"	PN 10	3PV	
Connection standard Clamp DIN 32676, row A metric			
DN 25	PN 25	4BL	
DN 32	PN 25	4CC	
DN 40	PN 25	4DL	
DN 50	PN 16	4EJ	
DN 65	PN 10	4FK	
Varivent			
DN 25/32	PN 25	5CL	
DN 40/50	PN 25	5DK	
DRD-flange			
DN 50	PN 40	6EM	
Other version Add Order code and plain text		9AA	H1Y

Selection and Ordering data	Article No.	Order code
Quick release diaphragm seal		
Flange type design, with flexible capillary tube or directly connected to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	7MF0830-	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately Scope of delivery: 1 off	7MF0832-	
	■■■■■-0■A0	■■■
Transmitter connection		
Without capillary tube, direct mount straight connection (for gauge pressure)	00	
Connection via capillary tube Length of capillary		
1 m	10	
1,6 m	11	
2 m	12	
2,5 m	13	
3 m	14	
4 m	15	
5 m	16	
6 m	17	
7 m	18	
8 m	20	
9 m	21	
10 m	22	
Other version Add Order code and plain text	98	L1Y
Filling liquid		
Food-grade oil (FDA listed)	E	
Other version Add Order code and plain text	Z	P1Y

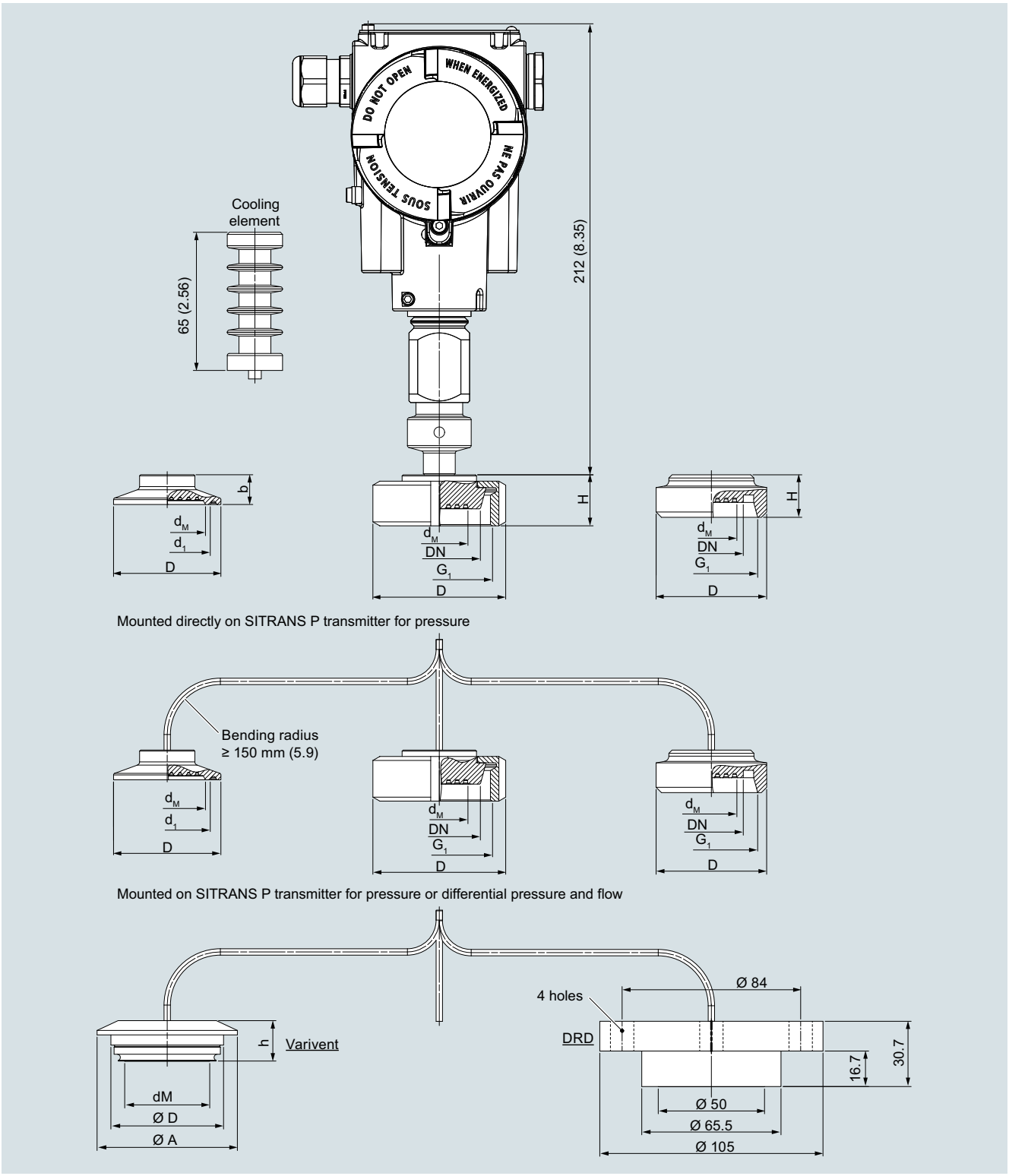
Quick-release diaphragm seals

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Factory certificates	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	**C11**
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	**C12**
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	**C15**
Certificate of FDA-approved fill oil (to EN10204-2.2)	**C17**
Factory certificate functional safety (SIL2/3), devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	**C20**
Negative pressure services	
Negative pressure service (for gauge and absolute pressure transmitters)	**D81**
Negative pressure service (for differential pressure transmitters)	**D83**
Extended negative pressure service (for gauge and absolute pressure transmitters)	**D85**
Extended negative pressure service (for differential pressure transmitters)	**D88**
Capillary connection (only for 7MF0830)	
Single-side mounted at differential pressure transmitters at high-side	**S03**
Single-side mounted at differential pressure transmitters at low-side	**S04**
Cooling element	**S08**
Capillary coating	
PE protective tube	
1 m	**S10**
1,6 m	**S11**
2 m	**S12**
2,5 m	**S13**
3 m	**S14**
4 m	**S15**
5 m	**S16**
6 m	**S17**
7 m	**S18**
8 m	**S19**
9 m	**S20**
10 m	**S21**
PTFE protective tube	
1 m	**S40**
1,6 m	**S41**
2 m	**S42**
2,5 m	**S43**
3 m	**S44**
4 m	**S45**
5 m	**S46**
6 m	**S47**
7 m	**S48**
8 m	**S49**
9 m	**S50**
10 m	**S51**

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
PVC protective tube	
1 m	**S70**
1,6 m	**S71**
2 m	**S72**
2,5 m	**S73**
3 m	**S74**
4 m	**S75**
5 m	**S76**
6 m	**S77**
7 m	**S78**
8 m	**S79**
9 m	**S80**
10 m	**S81**
Customer-specific tube length	
Customer-specific tube length (specify in plain text)	**Y44**
Specification of process conditions[1)]	
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

1) See also "Specification of process conditions for selection and ordering data", page 1/337.

Dimensional drawings



Quick-release diaphragm seal, dimensions in mm (inch)

Quick-release diaphragm seals

Connection to DIN 11851 with slotted union nut

Nominal diameter	Ø d_M	Ø D	H	G_1
	mm	mm	mm	mm
DN 25	25	63	36	Rd 52x1/6
DN 32	32	70	36	Rd 52x1/6
DN 40	40	78	36	Rd 65x1/6
DN 50	52	112	36	Rd 78x1/6
DN 65	65	112	36	Rd 95x1/6
DN 80	72	127	36	Rd 110x1/6

Connection to DIN 11851 with threaded socket

Nominal diameter	Ø d_M	H	G_1
	mm	mm	mm
DN 25	25	36	Rd 52x1/6
DN 32	32	36	Rd 52x1/6
DN 40	40	36	Rd 65x1/6
DN 50	52	36	Rd 78x1/6
DN 65	65	36	Rd 95x1/6
DN 80	72	36	Rd 110x1/6

Clamp connection to ISO 2852 for pipes to ISO 2037

Nominal diameter	Nominal pressure	d_M	d_1	b	D
		mm	mm	mm	mm
DN 25	PN 16	22.6	43.5	14	50.5
DN 38	PN 16	34	43.5	12	50.5
DN 51	PN 16	46	56.5	14	64
DN 63.5	PN 10	51	70.5	14	77.5
DN 76.1	PN 10	65	83.5	14	91

Clamp connection to DIN 32676 row C (Tri-Clamp) for pipes to ASME BPE

Nominal diameter	Nominal pressure	d_M	d_1	b	D
		mm (inch)	mm (inch)	mm (inch)	mm (inch)
1"	PN 25	22.6 (0.89)	43.5 (1.71)	14 (0.55)	50.5 (1.99)
1½"	PN 25	34 (1.34)	43.5 (1.71)	12 (0.47)	50.5 (1.99)
2"	PN 16	46 (1.81)	56.5 (2.22)	14 (0.55)	64 (2.52)
2½"	PN 16	51 (2.01)	70.5 (2.78)	14 (0.55)	77.5 (3.05)
3"	PN 16	65 (2.56)	83.5 (3.29)	14 (0.55)	91 (3.58)

Clamp connection to DIN 32676 row A (metric) for pipes to EN 10357 (DIN 11850)

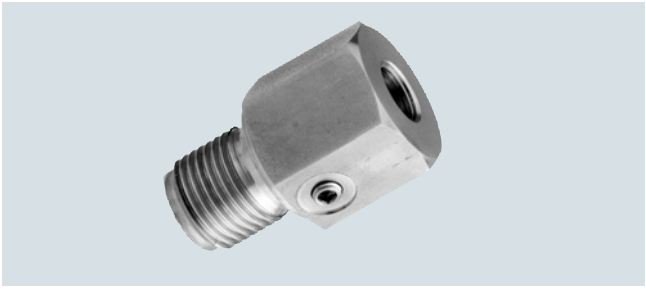
Nominal diameter	Nominal pressure	Ø d_M	d_1	b	D
		mm	mm	mm	mm
DN 25	PN 25	22.6	43.5	14	50.5
DN 32	PN 25	27	43.5	12	50.5
DN 40	PN 25	34	43.5	12	50.5
DN 50	PN 16	46	56.5	14	64
DN 65	PN 16	65	83.5	14	91

Varivent

Nominal diameter	d_M	A	D	h
	mm (inch)	mm (inch)	mm (inch)	mm (inch)
DN 25, DN 32, 1", 1¼"	40 (1.57)	66 (2.6)	50 (1.97)	19 (0.75)
DN 40 ... 125, 1 ½" ... 6"	58 (2.28)	84 (3.331)	68 (2.68)	19 (0.75)

d_M Effective diaphragm diameter

Overview



Miniature diaphragm seals

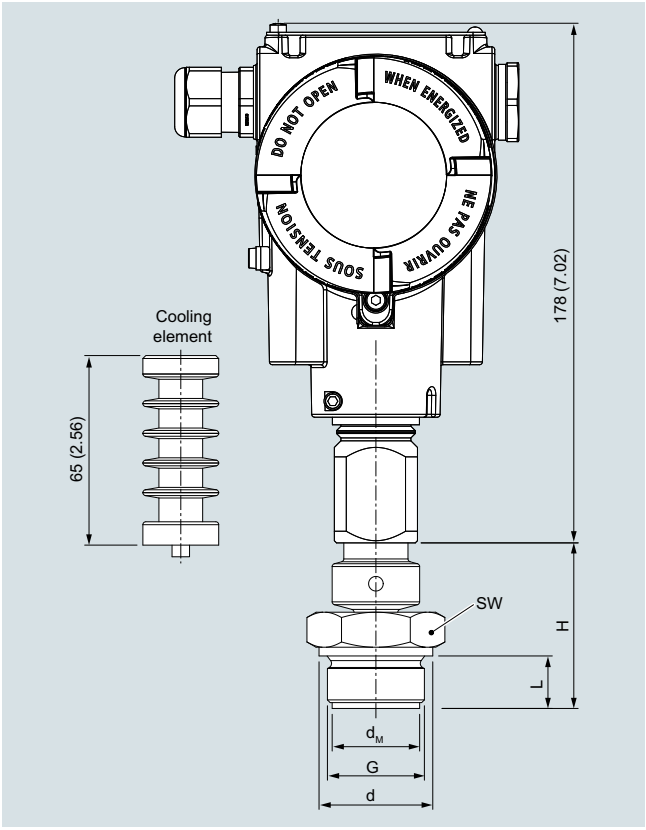
The miniature diaphragm seals are available for the SITRANS P320/420 pressure transmitter series.

Suitable for high pressures, contaminated, fibrous and viscous media in the chemical, paper, food and drink industries.

Design

- Flush-mounted diaphragm
- No dead spaces
- Fixed threaded stems

Dimensional drawings



Miniature diaphragm seal, dimensions in mm (inch)

G	Ø d_M		SW		Ø d		L		H	
	mm	(inch)	mm	(inch)	mm	(inch)	mm	(inch)	mm	(inch)
G1B	25	(0.98)	41	(1.61)	39	(1.53)	28	(1.1)	56	(2.21)
G1½B	40	(1.57)	55	(2.17)	60	(2.36)	30	(1.18)	50	(1.97)
G2B	50	(1.97)	60	(2.36)	70	(2.76)	30	(1.18)	63	(2.48)

G	Ø d_M		SW		L		H	
	mm	(inch)	mm	(inch)	mm	(inch)	mm	(inch)
1"-NPT	27	(1.06)	41	(1.61)	25	(0.98)	40	(1.57)
1½"-NPT	34	(1.34)	55	(2.17)	26	(1.02)	45	(1.77)
2"-NPT	46	(1.81)	65	(2.56)	26	(1.02)	45	(1.77)

d_M: Effective diaphragm diameter

Technical specifications

Miniature diaphragm seals	
Measuring span when	
• G1B and 1"-NPT	> 6 bar (> 87 psi)
• G1½B and 1½"-NPT	> 2 bar (> 29 psi)
• G2B and 2"-NPT	> 600 mbar (> 8.7 psi)
Filling liquid	Silicone oil M5 or food oil (FDA listed)
Material	
• Main body	Stainl. steel mat No. 1.4404/ 316L or Hastelloy C276, mat No. 2.4819
• Diaphragm	Stainl. steel mat No. 1.4404 / 316L or Hastelloy C276, mat. No. 2.4819
Maximum pressure	100% of nominal pressure of pressure transmitter, up to maximum of PN 400 (5802 psi) (depending on the seal used)
Temperature of use	Same as pressure transmitter
Temperature range of medium	Same as pressure transmitter
Max. recommended temperature of medium	150 °C (302 °F)
Weight	
• G1B and 1"-NPT	Approx. 0.3 kg (approx. 0.66 lb)
• G1½B and 1½"-NPT	Approx. 0.5 kg (approx. 1.10 lb)
• G2B and 2"-NPT	Approx. 0.8 kg (approx. 1.76 lb)
Certificate and approvals	
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

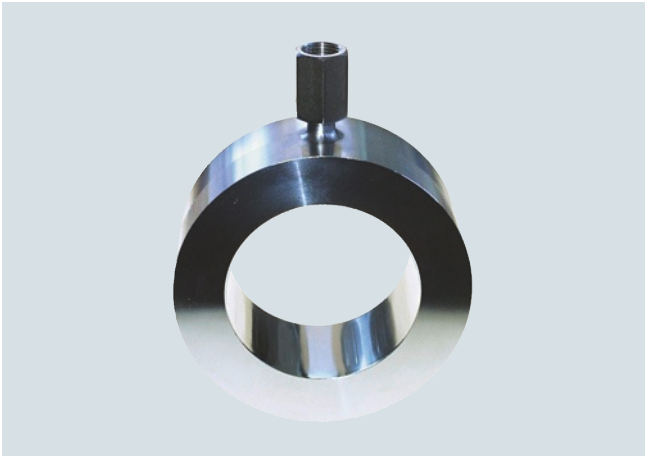
Miniature diaphragm seals

Selection and Ordering data		Article No.	Order code
Miniature diaphragm seal			
directly connected to a			
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off		**7MF0850-**	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		■■■**00-0**■■**0**	■■■
Process connection			
Connection standard DIN 3852			
G ½"	PN 400	**4ST**	
G ¾"	PN 400	**4SU**	
G 1"	PN 400	**4SV**	
G 1½"	PN 400	**4SW**	
G 2"	PN 400	**4SX**	
Connection standard ASME B1.20.1			
½"-NPT-M	class 5800	**5TS**	
¾"-NPT-M	class 5800	**5TT**	
1"-NPT-M	class 5800	**5TU**	
1½"-NPT-M	class 5800	**5TV**	
2"-NPT-M	class 5800	**5TW**	
Other version Add Order code and plain text		**9AA**	**H1Y**
Filling liquid			
Silicone oil M5		**A**	
Food-grade oil (FDA listed)		**E**	
Other version Add Order code and plain text		**Z**	**P1Y**
Wetted parts material			
Stainless steel 316L without coating		**A**	
Hastelloy C276, 2.4819		**J**	

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Factory certificates	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	**C11**
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	**C12**
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	**C13**
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	**C15**
Certificate of FDA-approved fill oil (to EN10204-2.2)	**C17**
Factory certificate functional safety (SIL2/3), devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	**C20**
Negative pressure services	
Negative pressure service	**D81**
Extended negative pressure service (for gauge and absolute pressure transmitters)	**D85**
Capillary connection	
Cooling element between transmitter and remote seal	**S08**
Customer-specific tube length	
Customer-specific tube length (specify in plain text)	**Y44**
Specification of process conditions[1]	
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

[1] See also "Specification of process conditions for selection and ordering data", page 1/337.

Overview



Inline seals for flange-mounting

The inline seal is completely integrated in the process line. It is particularly suitable for flowing and highly viscous media.

The inline seal consists of a cylindrical jacket into which a thin-walled pipe is welded. It is clamped directly between two flanges in the pipeline.

Design

- Inline seals for flange-mounting (flange design) to EN/ASME for SITRANS P pressure transmitters
  - For pressure: P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus
  - For differential pressure and flow: DS III with HART, DS III with PROFIBUS PA, DS III with FOUNDATION Fieldbus and P500
- Sealing surface to EN 1092-1 or ASME B16.5
- Connection to the transmitter directly or by means of a flexible capillary (max. 10 m long)
- See Technical data for details of materials used for the wetted parts
- Material used for the capillary, the guard sleeve, the seal's main body and the measuring cell: Stainless steel, mat.-No. 1.4571
- Filling liquid: Silicone oil, high-temperature oil, halocarbon oil, food oil (FDA listed) or glycerin/water (not suitable for uses in low-pressure range)

Function

The measured pressure is transferred from the diaphragm to the filling liquid and passes either directly or through the capillary to the measuring chamber of the pressure transmitter. The interior of the diaphragm seal and of the capillary, as well as the measuring chamber of the pressure transmitter, are filled gas-free by the filling liquid.

Note:

When operating in the low-pressure range, also during commissioning, it is recommended to use a vacuum-proof remote seal (see Selection and Ordering data).

Technical specifications

Inline seals for flange-mounting	
Nominal diameter	Nominal pressure
Connecting standard EN 1092-1	
• DN 25/40/50/65/80/100/125	PN 6 ... PN 100
Connecting standard ASME B16.5	
• 1, 1½, 2, 2½, 3, 4, 5 inch	Class 150 ... class 2500
Process connection	Flange to EN 1092-1 or ASME B 16.5
Sealing surface	• for stainless steel mat. no. 1.4404/316L according to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA
	• for all other materials according to EN 1092-1, form B2 or ASME B16.5 RFSF
Materials	
• Main body	Stainless steel 1.4404/316L
• Diaphragm	Stainless steel 1.4404/316L
• Wetted parts	Stainless steel 1.4404/316L
	• Without coating
	• ECTFE coating (for vacuum on request)
	• PFA coating
	Monel 400, mat. No. 2.4360
	Hastelloy C276, mat. No. 2.4819
	Hastelloy C4, mat. No. 2.4602
	Tantalum
• Capillary	Stainless steel, mat. No. 1.4404/316L
• Sheath	Spiral protective tube made of stainless steel, mat. No. 1.4301/316
Capillary	
• Length	Max. 10 m (32.8 ft)
• Internal diameter	2 mm (0.079 inch)
• Minimum bending radius	150 mm (5.9 inch)
Filling liquid	Silicone oil M5
	Silicone oil M50
	High-temperature oil
	Halocarbon oil
	Food oil (FDA listed)
Permissible ambient temperature	See pressure transmitters, see filling liquid
Weight	Approx. 4 kg (8.82 lb)
Certificates and approvals	
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord

1

Inline seals in sandwich design

Selection and Ordering data	Article No.	Order code
Inline seal		
Sandwich type design, directly connected or connected with flexible capillary tube to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off ↗	7MF0900-	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off ↗	7MF0902-	
	■■■■■-0■■0	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Nominal diameter **Nominal pressure**		
Connecting standard EN 1092-1		
DN 25 PN 6 ... 100	0BP	
DN 40 PN 6 ... 100	0DP	
DN 50 PN 6 ... 100	0EP	
DN 65 PN 6 ... 100	0FP	
DN 80 PN 6 ... 100	0GP	
DN 100 PN 6 ... 100	0HP	
DN 125 PN 6 ... 100	0JP	
Connecting standard ASME B16.5		
1 inch class 150 ... 2500	1KX	
1½ inch class 150 ... 2500	1LX	
2 inch class 150 ... 2500	1MX	
2½ inch class 150 ... 2500	1NX	
3 inch class 150 ... 2500	1PX	
4 inch class 150 ... 2500	1QX	
5 inch class 150 ... 2500	1RX	
Other version Add Order code and plain text	9AA	H1Y
Transmitter connection		
Without capillary tube, direct mount straight connection (for gauge pressure)	00	
Without capillary tube, direct mount connection via 90°-bow (for gauge pressure)	01	
Connection via capillary tube Length of capillary		
1 m	10	
1,6 m	11	
2 m	12	
2,5 m	13	
3 m	14	
4 m	15	
5 m	16	
6 m	17	
7 m	18	
8 m	20	
9 m	21	
10 m	22	
11 m (only for 7MF0900)	23	
12 m (only for 7MF0900)	24	
13 m (only for 7MF0900)	25	
14 m (only for 7MF0900)	26	
15 m (only for 7MF0900)	27	
Other version Add Order code and plain text	98	L1Y

Selection and Ordering data	Article No.	Order code
Inline seal		
Sandwich type design, directly connected or connected with flexible capillary tube to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	7MF0900-	
• SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off	7MF0902-	
	■■■■■-0■■0	■■■
Filling liquid		
Silicone oil M50	B	
High-temperature oil	C	
Silicone oil M5	A	
Food-grade oil (FDA listed)	E	
Halocarbon oil	D	
Other version Add Order code and plain text	Z	P1Y
Wetted parts materials		
Stainless steel 316L		
• Without coating	A	
• With PFA coating	D	
• With ECTFFE coating	F	
Monel 400, 2.4360	G	
Hastelloy C276, 2.4819	J	
Tantalum	K	
Hastelloy C4, 2.4610	U	
Other version Add Order code and plain text	Z	Q1Y

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Factory certificates	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	**C11**
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	**C12**
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	**C13**
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	**C15**
Certificate of FDA-approved fill oil (to EN10204-2.2)	**C17**
Factory certificate functional safety (SIL2/3), devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	**C20**
Accessories	
Spark arrestor (for gauge and absolute pressure transmitters)	**D61**
Spark arrestor (for differential pressure and level transmitters)	**D62**
Low-temperature version (for Silicon Oil M50 only)	**D67**
Negative pressure services	
Negative pressure service (for gauge and absolute pressure transmitters)	**D81**
Negative pressure service (for differential pressure transmitters)	**D83**
Extended negative pressure service (for gauge and absolute pressure transmitters)	**D85**
Extended negative pressure service (for differential pressure transmitters)	**D88**
General product approvals without explosion proof approvals	
Oil-and grease-free cleaned version (for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	**E80**
Oil-and grease-free cleaned version (not for O_2-appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)	**E87**
Sealing surface	
Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)	**M50**
Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)	**M54**
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)	**M64**
Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)	
• DN 25	**M70**
• DN 40	**M71**
• DN 50	**M72**
• DN 80	**M73**
• DN 100	**M74**
• DN 125	**M75**
Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)	
• DN 25	**M76**
• DN 40	**M77**
• DN 50	**M78**
• DN 80	**M79**
• DN 100	**M80**
• DN 125	**M81**

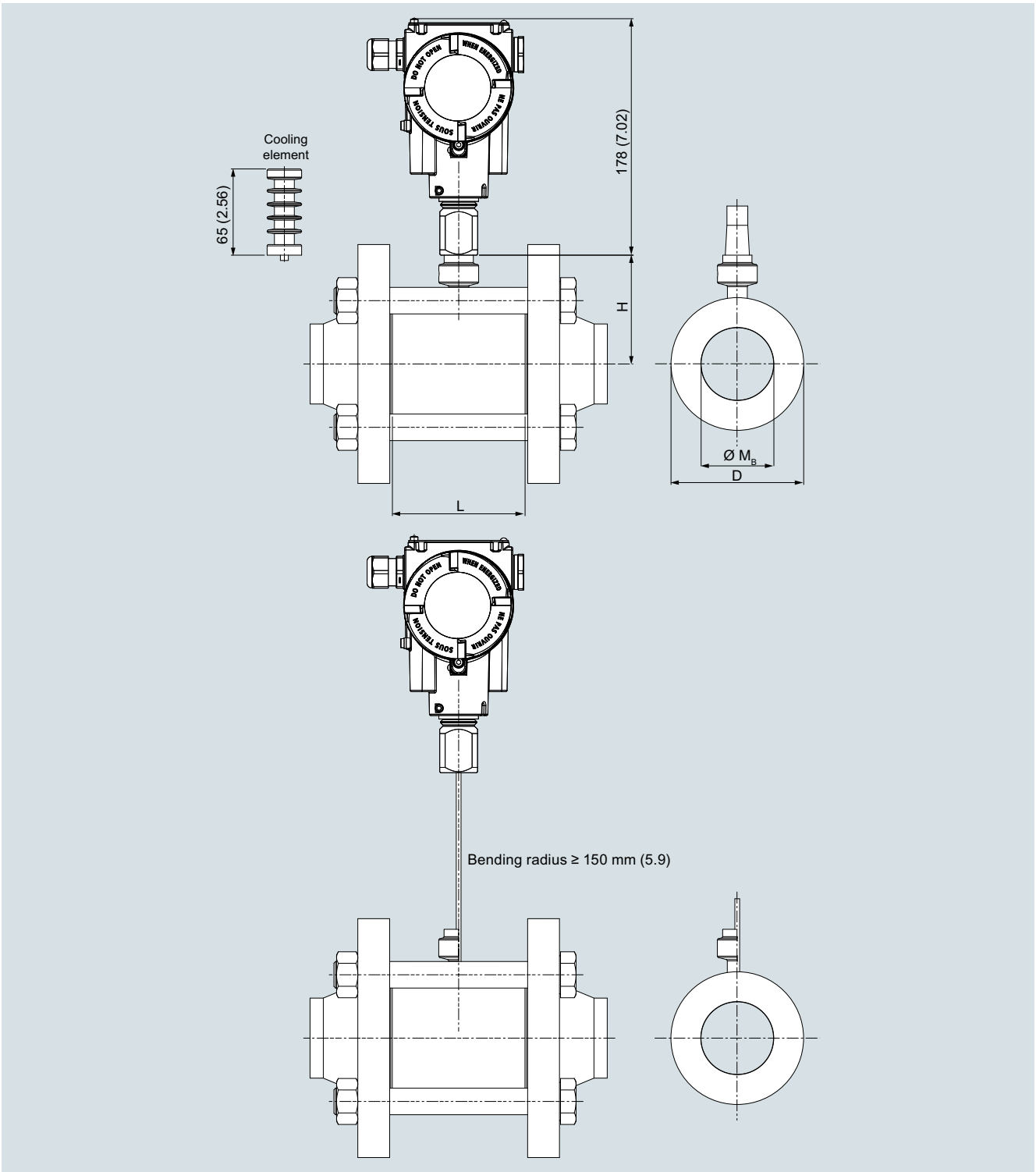
Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)	
• DN 25	**M82**
• DN 40	**M83**
• DN 50	**M84**
• DN 80	**M85**
• DN 100	**M86**
• DN 125	**M87**
Capillary connection	
For 7MF0900	
Single-side mounted at differential pressure transmitters at high-side	**S03**
Single-side mounted at differential pressure transmitters at low-side	**S04**
cooling element	**S08**
Capillary coating	
PE protective tube	
1 m	**S10**
1,6 m	**S11**
2 m	**S12**
2,5 m	**S13**
3 m	**S14**
4 m	**S15**
5 m	**S16**
6 m	**S17**
7 m	**S18**
8 m	**S19**
9 m	**S20**
10 m	**S21**
11 m (only for 7MF0902)	**S22**
12 m (only for 7MF0902)	**S23**
13 m (only for 7MF0902)	**S24**
14 m (only for 7MF0902)	**S25**
15 m (only for 7MF0902)	**S26**
PTFE protective tube	
1 m	**S40**
1,6 m	**S41**
2 m	**S42**
2,5 m	**S43**
3 m	**S44**
4 m	**S45**
5 m	**S46**
6 m	**S47**
7 m	**S48**
8 m	**S49**
9 m	**S50**
10 m	**S51**
11 m (only for 7MF0902)	**S52**
12 m (only for 7MF0902)	**S53**
13 m (only for 7MF0902)	**S54**
14 m (only for 7MF0902)	**S55**
15 m (only for 7MF0902)	**S56**

Inline seals in sandwich design

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
PVC protective tube	
1 m	**S70**
1,6 m	**S71**
2 m	**S72**
2,5 m	**S73**
3 m	**S74**
4 m	**S75**
5 m	**S76**
6 m	**S77**
7 m	**S78**
8 m	**S79**
9 m	**S80**
10 m	**S81**
11 m (only for 7MF0902)	**S82**
12 m (only for 7MF0902)	**S83**
13 m (only for 7MF0902)	**S84**
14 m (only for 7MF0902)	**S85**
15 m (only for 7MF0902)	**S86**
Customer-specific tube length	
Customer-specific tube length (specify in plain text)	**Y44**
Specification of process conditions[1)]	
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

1) See also "Specification of process conditions for selection and ordering data", page 1/337.

Dimensional drawings



Inline seal for flange-mounting, connected to SITRANS P pressure transmitter, dimensions in mm (inch)

Inline seals in sandwich design

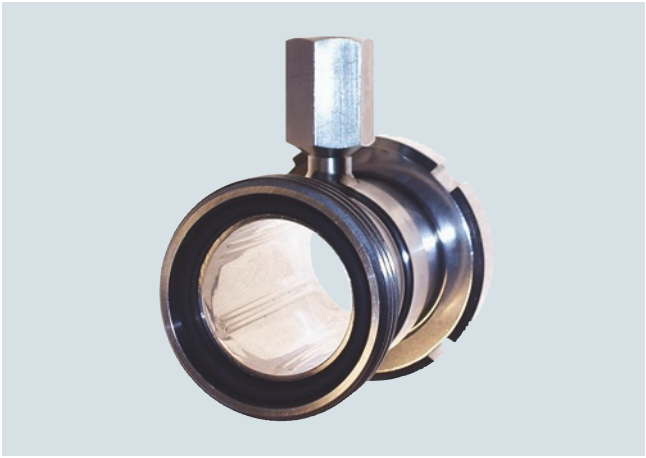
Connection to EN 1092-1

DN	PN	D	Mb	L	H
mm	bar	mm	mm	mm	mm
25	6 ... 100	68	28.5	60	81
40		88	43.1	60	91
50		100	54.5	60	93
65		120	70.3	60	107
80		138	82.5	60	116
100		160	107.1	60	127
125		188	127	60	141

Connection to ASME B16.5

DN	Class	D	Mb	L	H
(inch)		mm (inch)	mm (inch)	mm (inch)	mm (inch)
1	150 ... 2500	50 (1.97)	28.5 (1.12)	60 (2.36)	72 (2.83)
1½	150 ... 2500	73.5 (2.89)	43.1 (1.70)	60 (2.36)	84 (3.31)
2	150 ... 2500	91.9 (3.62)	54.5 (2.15)	60 (2.36)	93 (3.66)
2½	150 ... 2500	104.6 (4.12)	70.3 (2.77)	60 (2.36)	99 (3.9)
3	150 ... 2500	127 (5)	82.5 (3.25)	60 (2.36)	110 (4.33)
4	150 ... 2500	157.2 (6.19)	107.1 (4.22)	60 (2.36)	125 (4.92)
5	150 ... 2500	188 (7.4)	127 (5)	60 (2.36)	141 (5.55)

Overview



Quick-release inline seals, to DIN 11851 with threaded socket

Quick-release inline seals, with clamp connection

Quick-release inline seals for pressure are available for the following SITRANS P pressure transmitter series:

- P300
- DS III with HART
- DS III with PROFIBUS PA
- DS III with FOUNDATION Fieldbus

Application

The quick-release inline seal is a special design for flowing and high-viscosity media. Because it is completely integrated in the process line, there are no turbulences, dead spaces or other obstacles in the flow direction. The medium flows almost unhindered through the inline seal and causes self-cleaning of the sample chamber. The inline seal is also piggable.

Design

The quick-release clamp is available in two versions:

- DIN 11851 with threaded socket
- Clamp connection

The inline seal is connected to the pressure transmitter either directly or by way of a capillary.

Function

The measured pressure is transferred from the diaphragm, mounted on the inner circumference of the inline seal, to the filling liquid and then passes through the capillary to the measuring chamber of the pressure transmitter. The interior of the inline seal and of the capillary, as well as the measuring chamber of the pressure transmitter, are filled gas-free by the filling liquid.

Note:

When operating in the low-pressure range, also during commissioning, it is recommended to use a vacuum-proof pressure transmitter (see Selection and Ordering data).

Technical specifications

Quick-release inline seals for gauge pressure		
Connection	Nominal diameter	Nominal pressure
• Standard to DIN 11851 with thread	DN 25/32/40	PN 40
	DN 50/65/80	PN 25
• Standard Clamp ISO 2852	DN 25/38/51	PN 16
	DN 63.5/76.1	PN 10
• Standard Clamp DIN 32676, row C Tri-clamp	1, 1½ inch	PN 25
	2, 2½ inch	PN 16
	3 inch	PN 10
• Standard Clamp DIN 32676, row A metric	DN 25/32/40	PN 25
	DN 50	PN 16
	DN 65	PN 10
Material		
• Main body	Stainless steel 1.4404/316L	
• Diaphragm	Stainless steel 1.4404/316L	
Capillary		
• Length	Max. 10 m (32.8 ft)	
• Internal diameter	2 mm (0.079 inch)	
• Minimum bending radius	150 mm (5.9 inch)	
• Sheath	Spiral protective tube made of stainless steel, mat. No. 1.4404/316L	
Filling liquid	• Food oil (FDA listed)	
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal More information can be found in the technical data of the pressure transmitters and in the section "Technical data of filling liquid" in the Technical description to the remote seals	
Weight	Approx. 4 kg (approx. 8.82 lb)	
Certificate and approvals		
Classification according to pressure equipment directive (DGRL 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with the requirements of article 4, paragraph 1 (appendix 1); assigned to category III, conformity evaluation module H by the TÜV Nord	
EHEDG	Complies with EHEDG recommendations	

1

Quick-release inline seals

Selection and Ordering data	Article No.	Order code
Quick release inline-seal		
Flange type design, with flexible capillary tube or directly connected to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	7MF0930-	
	■■■■■-0■A0	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Nominal diameter **Nominal pressure**		
Connection standard DIN 11851 with thread		
DN 25 PN 40	1BM	
DN 32 PN 40	1CD	
DN 40 PN 40	1DM	
DN 50 PN 25	1EK	
DN 65 PN 25	1FL	
DN 80 PN 25	1GK	
Connection standard Clamp ISO 2852		
DN 25 PN 16	2BK	
DN 38 PN 16	2CQ	
DN 51 PN 16	2FH	
DN 63,5 PN 10	2FJ	
DN 76,1 PN 10	2GJ	
Connection standard Clamp DIN 32676, row C Tri-clamp		
DN 1" PN 25	3KV	
DN 1½" PN 25	3LV	
DN 2" PN 16	3MV	
DN 2½" PN 16	3NV	
DN 3" PN 10	3PV	
Connection standard Clamp DIN 32676, row A metric		
DN 25 PN 25	4BL	
DN 32 PN 25	4CC	
DN 40 PN 25	4DL	
DN 50 PN 16	4EJ	
DN 65 PN 10	4FK	
Other version Add Order code and plain text	9AA	H1Y

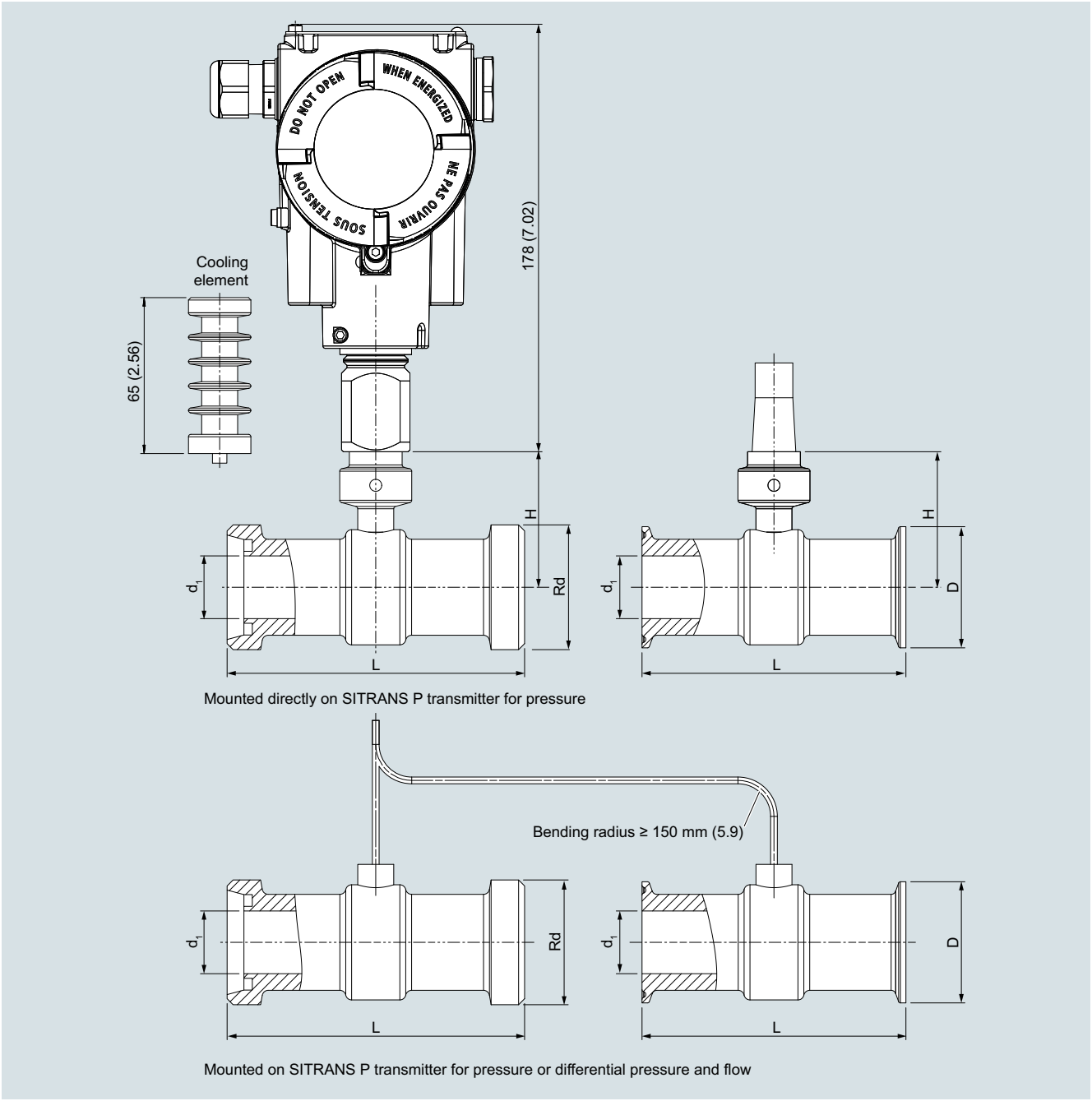
Selection and Ordering data	Article No.	Order code
Quick release inline-seal		
Flange type design, with flexible capillary tube or directly connected to a		
• SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately Scope of delivery: 1 off	7MF0930-	
	■■■■■-0■A0	■■■
Transmitter connection		
Without capillary tube, direct mount straight connection (for gauge pressure)	00	
Connection via capillary tube Length of capillary		
1 m	10	
1,6 m	11	
2 m	12	
2,5 m	13	
3 m	14	
4 m	15	
5 m	16	
6 m	17	
7 m	18	
8 m	20	
9 m	21	
10 m	22	
Other version Add Order code and plain text	98	L1Y
Filling liquid		
Food-grade oil (FDA listed)	E	
Other version Add Order code and plain text	Z	P1Y

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
Factory certificates	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	**C11**
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	**C12**
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	**C15**
Certificate of FDA-approved fill oil (to EN10204-2.2)	**C17**
Factory certificate functional safety (SIL2/3), devices suitable for use according to IEC 61508 and IEC 61511 (includes SIL conformity declaration)	**C20**
Negative pressure services	
Negative pressure service (for gauge and absolute pressure transmitters)	**D81**
Extended negative pressure service (for gauge and absolute pressure transmitters)	**D85**
Capillary connection	
Single-side mounted at differential pressure transmitters at high-side	**S03**
Single-side mounted at differential pressure transmitters at low-side	**S04**
cooling element	**S08**
Capillary coating	
PE protective tube	
1 m	**S10**
1,6 m	**S11**
2 m	**S12**
2,5 m	**S13**
3 m	**S14**
4 m	**S15**
5 m	**S16**
6 m	**S17**
7 m	**S18**
8 m	**S19**
9 m	**S20**
10 m	**S21**
PTFE protective tube	
1 m	**S40**
1,6 m	**S41**
2 m	**S42**
2,5 m	**S43**
3 m	**S44**
4 m	**S45**
5 m	**S46**
6 m	**S47**
7 m	**S48**
8 m	**S49**
9 m	**S50**
10 m	**S51**

Selection and Ordering data	Order code
Further designs	
Add "**-Z**" to Article No. and specify Order code.	
PVC protective tube	
1 m	**S70**
1,6 m	**S71**
2 m	**S72**
2,5 m	**S73**
3 m	**S74**
4 m	**S75**
5 m	**S76**
6 m	**S77**
7 m	**S78**
8 m	**S79**
9 m	**S80**
10 m	**S81**
Customer-specific tube length	
Customer-specific tube length (specify in plain text)	**Y44**
Specification of process conditions[1)]	
Ambient temperature range	
• -10 ... +50 °C (14 ... +122 °F) preset	**D66**
• -40 ... +50 °C (-40 ... +122 °F)	**D67**
• -10 ... +85 °C (14 ... +185 °F)	**D68**
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	**Y50**

1) See also "Specification of process conditions for selection and ordering data", page 1/337.

Dimensional drawings



Quick-release inline seal, dimensions in mm (inch)

Inline seals for pipes according to EN 10357 (DIN 11851)

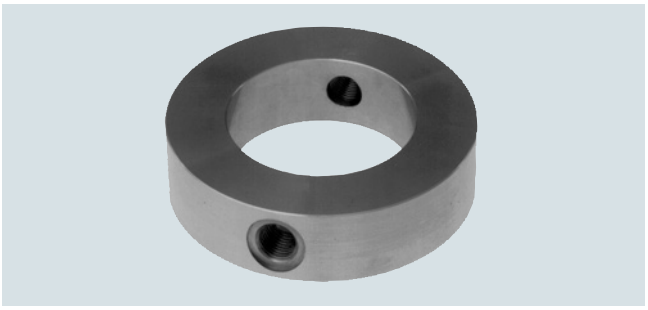
				Food connections			
				DIN 11851		DIN 32676	
	Length	Inner diameter	Connection height	Nominal pressure	Round thread connection to DIN 11851	Nominal pressure	Clamp connection to DIN 32676
Nominal diameter	L (mm)	di (mm)	h (mm)		Thread Rd		D (mm)
DN 10	96	10	27.5	PN 40	28 x 1/8"	PN 16	34
DN 15	150	16	12	PN 40	34 x 1/8"	PN 16	34
DN 25	110	26	21	PN 40	52 x 1/6"	PN 16	50.5
DN 32	110	32	26	PN 40	58 x 1/6"	PN 16	50.5
DN 40	110	38	28.5	PN 40	65 x 1/6"	PN 16	50.5
DN 50	110	50	34	PN 25	78 x 1/6"	PN 16	64
DN 65	110	66	42	PN 25	95 x 1/6"	PN 10	91
DN 80	60	81	47.5	PN 25	110 x 1/4"	PN 10	106
DN 100	60	100	60	PN 25	130 x 1/4"	PN 10	119

Inline seals for pipes according to BS 4825 Part 3 and O.D. Tube (suitable for pipes according to ASME-BPE)

					Food connection			
					IDF to ISO 2853		Clamp connection to ISO 2852	
		Length	Inner diameter	Connection height	Nominal pressure	IDF-Thread to ISO 2853	Nominal pressure	Clamp connection to ISO 2852
Nominal diameter		L (mm)	di (mm)	h (mm)		IDF-thread (Tr)		D (mm)
1 inch	25.4 mm	110	22.2	21	PN 40	37 x 3.175	PN 16	50.5
1½ inch	38 mm	110	34.8	28.5	PN 40	50 x 3.175	PN 16	50.5
2 inch	51 mm	110	47.8	34	PN 25	64 x 3.175	PN 16	64
1½ inch	63.5 mm	110	60.3	38	PN 25	77.5 x 3.175	PN 16	77.5
3 inch	76.1 mm	60	72.9	44.5	PN 25	91 x 3.175	PN 10	91
4 inch	101.6 mm	60	97.6	59.5	PN 25	118 x 3175	PN 10	119

Flushing rings for diaphragm seals

Overview



Flushing ring

Flushing rings are required for flange-mounted and sandwich-type remote seals (Article No. 7MF0800 ... 7MF0814) if the danger exists that the process conditions and the geometry of the connection could cause the medium 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.

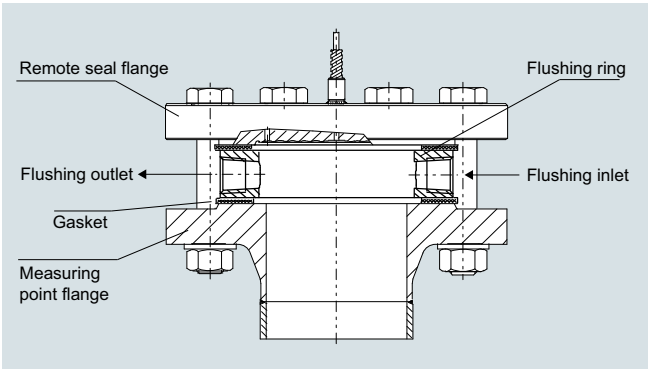
Process connection

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 Selection and Ordering data

Design



Installation example

Technical specifications

Flushing ring for remote seals of sandwich and flange design	
Nominal diameter	Nominal pressure
• 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 surface	
• 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
	RJF ring groove
Flushing holes (2 off), female thread	• G¼
	• G½
	• ¼-18 NPT
	• ½-14 NPT
Material	Stainless steel 1.4404/316L

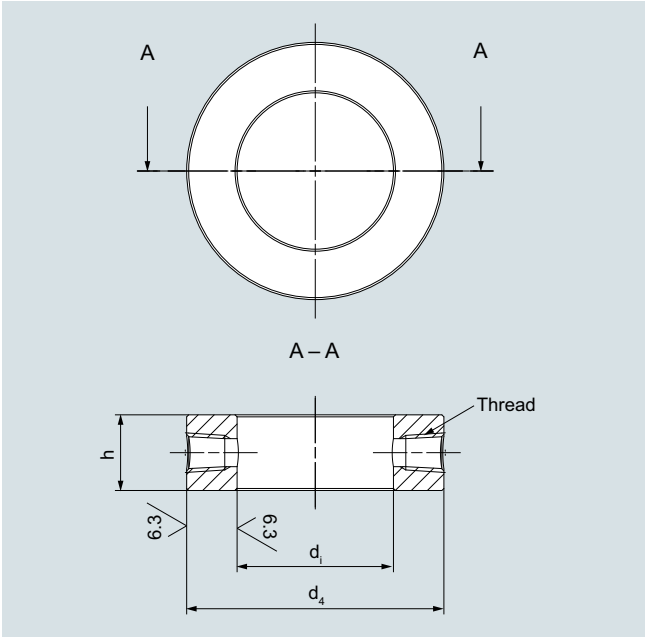
Selection and Ordering data

		Article No.Ord. code
Flushing ring		7MF4925-
for remote seals 7MF0800 to 7MF0814		1
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Nom. diam.	**Nominal pressure**	
• DN 50	PN 16 ... PN 100	A
• DN 80	PN 16 ... PN 100	B
• DN 100	PN 16 ... PN 100	C
• DN 125	PN 16 ... PN 100	D
• 2 inch	Class 150 ... 600	G
• 3 inch	Class 150 ... 600	H
• 4 inch	Class 150 ... 600	J
• 5 inch	Class 150 ... 600	K
Only for RJF ring groove, 7MF4925-1*R....:		
• 2 inch	Class 150	NR
• 3 inch	Class 150	PR
• 4 inch	Class 150	QR
• 5 inch	Class 150	RR
• 2 inch	Class 300 ... 600	UR
• 3 inch	Class 300 ... 600	VR
• 4 inch	Class 300 ... 600	WR
• 5 inch	Class 300 ... 600	XR
Other version Add Order code and plain text: Nominal diameter: ...; Nominal pressure: ...		Z J1Y
Sealing surface		
• EN 1092-1		
- Form B1		A
- Form B2		C
- Form C/Form C		D
- Form D/Form C		E
- Form D/Form D		F
- Form E		G
- Form F		H
• ASME B16.5		
- RF 125 ... 250 AA		M
- RFSF		Q
- RJF ring groove		R
Other version Add Order code and plain text: Sealing surface: ...		Z K1Y
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 M1Y
Further designs Please add "**-Z**" to Article No. and specify Order code.		Order code
Inspection certificate to EN 10204, section 3.1		C12

Dimensional drawings

Connection according to EN 1092-1

Form B1 and form B2

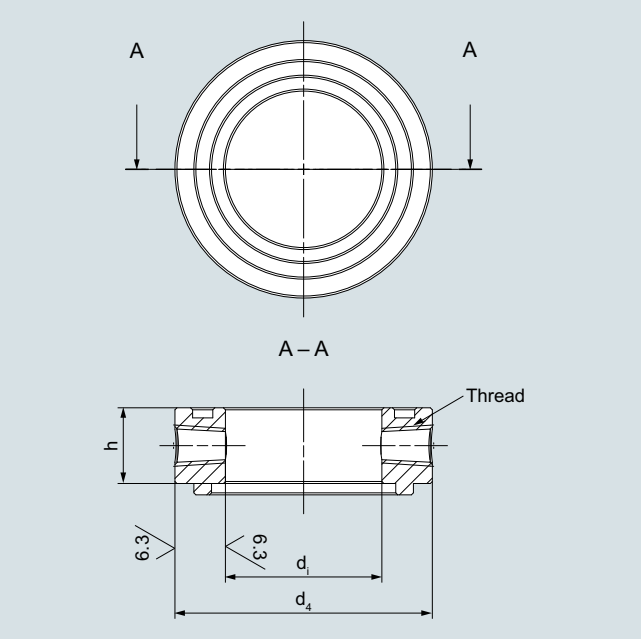


Flushing ring; sealing surface (EN 1092-1), form B1 and form B2

DN	PN	Thread	d_4	d_i	h	Weight
mm	bar		Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg (lb)
50	16 … 100	¼ NPT	102 (4.02)	62 (2.44)	30 (1.18)	1.24 (2.73)
80	16 … 100	¼ NPT	138 (5.43)	92 (3.62)	30 (1.18)	1.99 (4.39)
100	16 … 100	¼ NPT	162 (6.38)	92 (3.62)	30 (1.18)	3.35 (7.39)
125	16 … 100	¼ NPT	188 (7.40)	132 (5.2)	30 (1.18)	3.38 (7.45)
50	16 … 100	½ NPT	102 (4.02)	62 (2.44)	30 (1.18)	1.24 (2.73)
80	16 … 100	½ NPT	138 (5.43)	92 (3.62)	30 (1.18)	1.99 (4.39)
100	16 … 100	½ NPT	162 (6.38)	92 (3.62)	30 (1.18)	3.35 (7.39)
125	16 … 100	½ NPT	188 (7.40)	132 (5.2)	30 (1.18)	3.38 (7.45)

Flushing rings for diaphragm seals

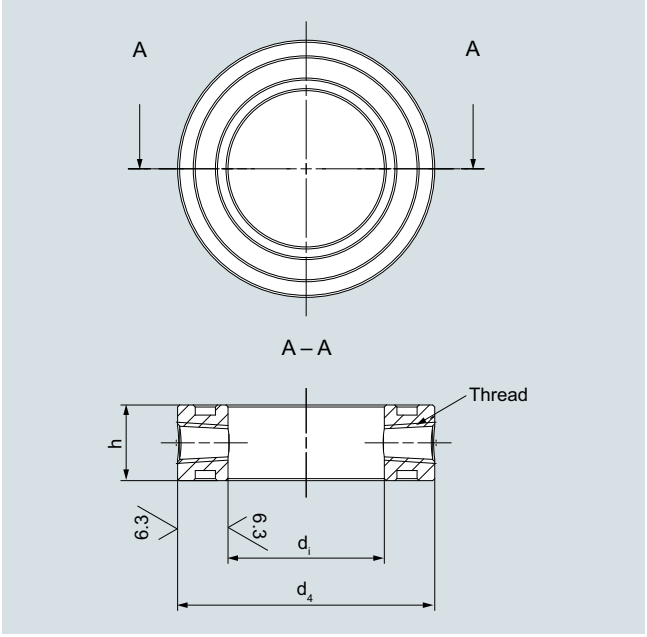
Form D/form C



Flushing ring; sealing surface (EN 1092-1), form D/form C

DN	PN	Thread	d_4	d_i	h	Weight
mm	bar		Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg (lb)
50	16 … 100	¼ NPT	102 (4.02)	62 (2.44)	35.5 (1.40)	1.46 (3.22)
80	16 … 100	¼ NPT	138 (5.43)	92 (3.62)	35.5 (1.40)	2.36 (5.2)
100	16 … 100	¼ NPT	162 (6.38)	92 (3.62)	35.5 (1.40)	3.96 (8.73)
125	16 … 100	¼ NPT	188 (7.40)	132 (5.2)	35.5 (1.40)	4.00 (8.82)
50	16 … 100	½ NPT	102 (4.02)	62 (2.44)	40.5 (1.595)	1.67 (3.68)
80	16 … 100	½ NPT	138 (5.43)	92 (3.62)	40.5 (1.595)	2.69 (5.93)
100	16 … 100	½ NPT	162 (6.38)	92 (3.62)	40.5 (1.595)	4.52 (9.97)
125	16 … 100	½ NPT	188 (7.40)	132 (5.2)	40.5 (1.595)	4.56 (10.05)

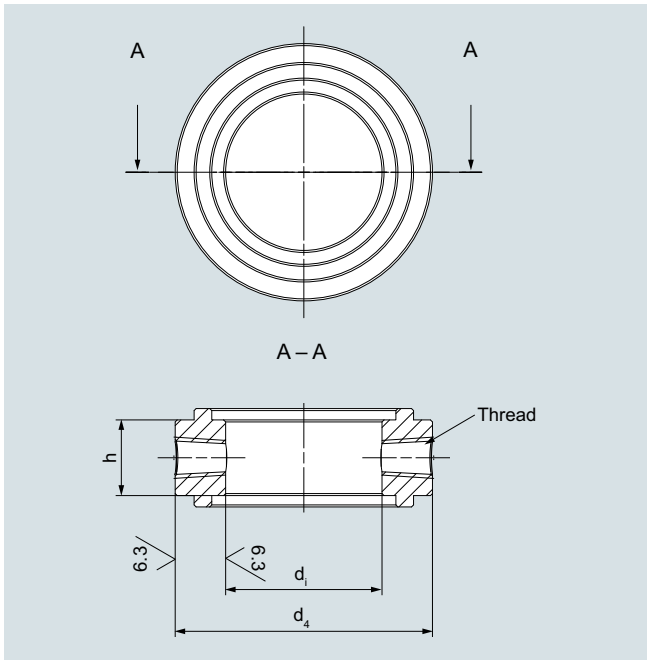
Form D/form D



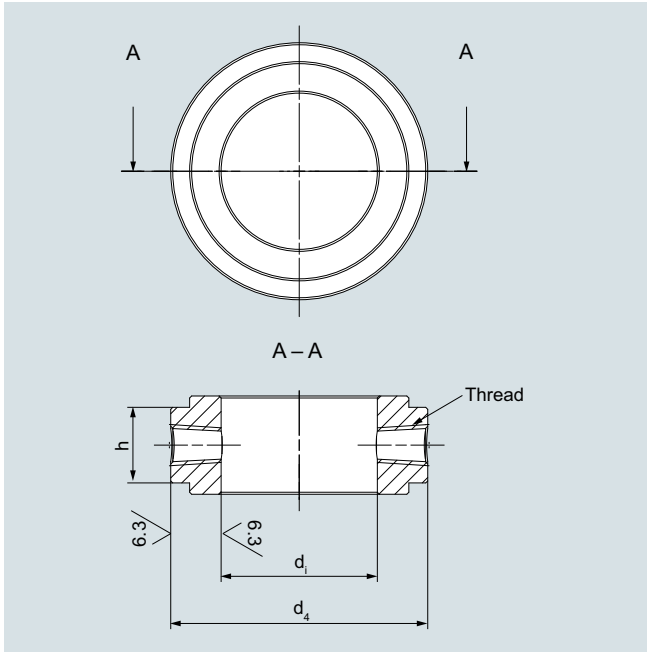
Flushing ring; sealing surface (EN 1092-1), form D/form D

DN	PN	Thread	d_4	d_i	h	Weight
mm	bar		Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg lb)
50	16 … 100	¼ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
80	16 … 100	¼ NPT	138 (5.43)	92 (3.62)	40 (1.58)	2.66 (5.86)
100	16 … 100	¼ NPT	162 (6.38)	92 (3.62)	40 (1.58)	4.47 (9.86)
125	16 … 100	¼ NPT	188 (7.40)	132 (5.2)	40 (1.58)	4.50 (9.92)
50	16 … 100	½ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
80	16 … 100	½ NPT	138 (5.43)	92 (3.62)	40 (1.58)	2.66 (5.86)
100	16 … 100	½ NPT	162 (6.38)	92 (3.62)	40 (1.58)	4.47 (9.86)
125	16 … 100	½ NPT	188 (7.40)	132 (5.2)	40 (1.58)	4.50 (9.92)

Form C/form C and form E



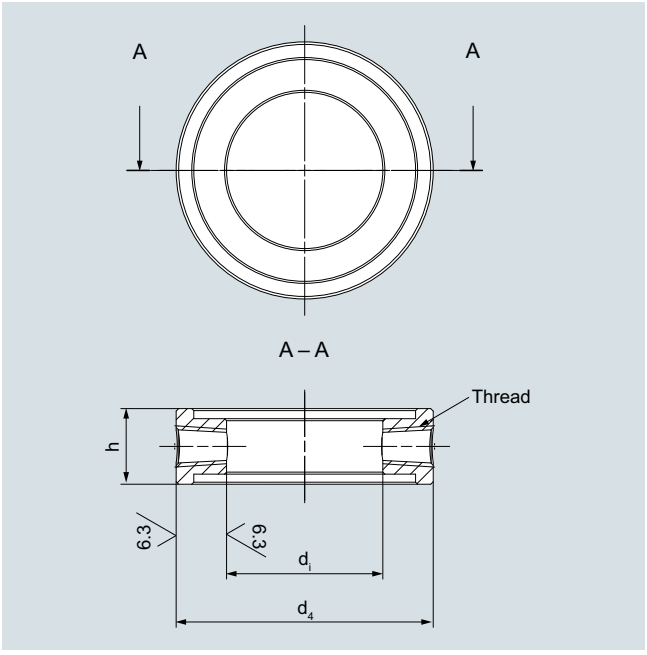
Flushing ring; sealing surface (EN 1092-1), form C/form C



Flushing ring; sealing surface (EN 1092-1), form E

DN	PN	Thread	d_4	d_i	h	x	f3	Weight
mm	bar		Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg (lb)
50	16 … 100	¼ NPT	102 (4.02)	62 (2.44)	31 (1.22)	87 (3.43)	4.5 (0.18)	1.49 (3.28)
80	16 … 100	¼ NPT	138 (5.43)	92 (3.62)	31 (1.22)	120 (4.72)	4.5 (0.18)	2.40 (5.29)
100	16 … 100	¼ NPT	162 (6.38)	92 (3.62)	30 (1.18)	149 (5.87)	5 (0.2)	4.21 (9.28)
125	16 … 100	¼ NPT	188 (7.40)	132 (5.2)	30 (1.18)	175 (6.89)	5 (0.2)	4.21 (9.28)
50	16 … 100	½ NPT	102 (4.02)	62 (2.44)	31 (1.22)	87 (3.43)	4.5 (0.18)	1.49 (3.28)
80	16 … 100	½ NPT	138 (5.43)	92 (3.62)	31 (1.22)	120 (4.72)	4.5 (0.18)	2.40 (5.29)
100	16 … 100	½ NPT	162 (6.38)	92 (3.62)	30 (1.18)	149 (5.87)	5 (0.2)	4.21 (9.28)
125	16 … 100	½ NPT	188 (7.40)	132 (5.2)	30 (1.18)	175 (6.89)	5 (0.2)	3.38 (7.45)

Form F



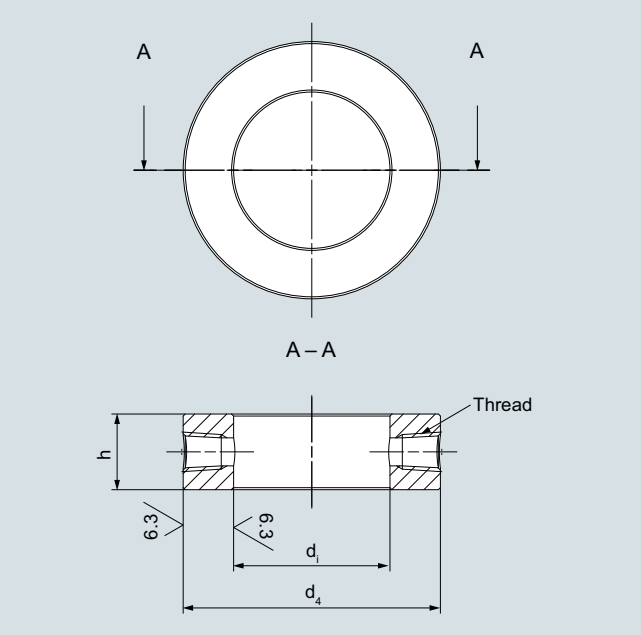
Flushing ring; sealing surface (EN 1092-1), form F

DN	PN	Thread	d_4	d_i	h	x	f3	Weight
mm	bar		Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg lb)
50	16 … 100	¼ NPT	102 (4.02)	62 (2.44)	35 (1.38)	88 (3.46)	4 (0.16)	1.25 (2.76)
80	16 … 100	¼ NPT	138 (5.43)	92 (3.62)	35 (1.38)	121 (4.76)	4 (0.16)	2.02 (4.45)
100	16 … 100	¼ NPT	162 (6.38)	92 (3.62)	35 (1.38)	150 (5.91)	4.5 (0.18)	3.11 (6.86)
125	16 … 100	¼ NPT	188 (7.40)	132 (5.2)	35 (1.38)	175 (6.89)	4.5 (0.18)	3.19 (7.03)
50	16 … 100	½ NPT	102 (4.02)	62 (2.44)	40 (1.58)	88 (3.46)	4 (0.16)	1.45 (3.2)
80	16 … 100	½ NPT	138 (5.43)	92 (3.62)	40 (1.58)	121 (4.76)	4 (0.16)	2.35 (5.18)
100	16 … 100	½ NPT	162 (6.38)	92 (3.62)	40 (1.58)	150 (5.91)	4.5 (0.18)	3.67 (8.09)
125	16 … 100	½ NPT	188 (7.40)	132 (5.2)	40 (1.58)	175 (6.89)	4.5 (0.18)	3.76 (8.29)

Flushing rings for diaphragm seals

Connection according to ASME B 16.5

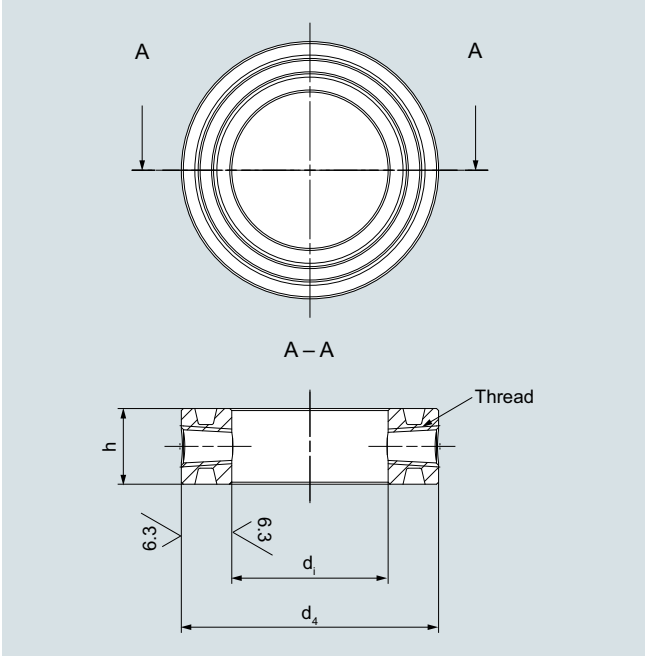
RFSF and RF 125 ... 250 AA



Flushing ring; sealing surface (ASME B 16.5), RFSF and RF 125 to 250 AA

DN	Class	Thread	d_4	d_i	h	Weight
inch			Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg lb)
2	150 … 600	¼ NPT	92 (3.62)	62 (2.44)	30 (1.18)	0.87 (1.92)
3	150 … 600	¼ NPT	127 (5)	92 (3.62)	30 (1.18)	1.44 (3.17)
4	150 … 600	¼ NPT	157 (6.18)	92 (3.62)	30 (1.18)	3.05 (6.72)
5	150 … 600	¼ NPT	186 (7.32)	141 (5.55)	30 (1.18)	2.77 (6.11)
2	150 … 600	½ NPT	92 (3.62)	62 (2.44)	30 (1.18)	0.87 (1.92)
3	150 … 600	½ NPT	127 (5)	92 (3.62)	30 (1.18)	1.44 (3.17)
4	150 … 600	½ NPT	157 (6.18)	92 (3.62)	30 (1.18)	3.05 (6.72)
5	150 … 600	½ NPT	186 (7.32)	141 (5.55)	30 (1.18)	2.77 (6.11)

RJF ring groove



Flushing ring; sealing surface (ASME B 16.5), RJF ring groove

DN	Class	Thread	d_4	d_i	h	Weight
inch			Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg lb)
2	150	¼ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
3	150	¼ NPT	133 (5.24)	92 (3.62)	40 (1.58)	2.32 (5.12)
4	150	¼ NPT	171 (6.73)	92 (3.62)	40 (1.58)	5.22 (11.51)
5	150	¼ NPT	194 (7.64)	141 (5.55)	40 (1.58)	4.46 (9.83)
2	150	½ NPT	102 (4.02)	62 (2.44)	46 (1.81)	1.90 (4.19)
3	150	½ NPT	133 (5.24)	92 (3.62)	46 (1.81)	2.66 (5.86)
4	150	½ NPT	171 (6.73)	92 (3.62)	46 (1.81)	6.00 (13.23)
5	150	½ NPT	194 (7.64)	141 (5.55)	46 (1.81)	5.13 (11.31)
2	300 … 600	¼ NPT	108 (4.25)	62 (2.44)	40 (1.58)	1.96 (4.32)
3	300 … 600	¼ NPT	146 (5.75)	92 (3.62)	40 (1.58)	3.23 (7.12)
4	300 … 600	¼ NPT	175 (6.89)	92 (3.62)	40 (1.58)	5.57 (12.28)
5	300 … 600	¼ NPT	210 (8.27)	141 (5.55)	40 (1.58)	6.08 (13.4)
2	300 … 600	½ NPT	108 (4.25)	62 (2.44)	46 (1.81)	2.26 (4.98)
3	300 … 600	½ NPT	146 (5.75)	92 (3.62)	46 (1.81)	3.71 (8.18)
4	300 … 600	½ NPT	175 (6.89)	92 (3.62)	46 (1.81)	6.4 (14.11)
5	300 … 600	½ NPT	210 (8.27)	141 (5.55)	46 (1.81)	7 (15.43)

Overview

This section shows examples of typical measuring setups for using SITRANS P pressure transmitters with and without remote seals.

Equations for calculating lower range value and upper range value are provided for each example.

Questionnaires are included to help you select the right combination of remote seal and pressure transmitter.

Installation

Remote seals of sandwich design are fitted between the connection flange of the measuring point and a dummy flange. Remote seals of flange design are fitted directly on the connection flange of the measuring point. The respective pressure rating of the dummy flange or the flanged remote seal must be observed.

The pressure transmitter should be installed below the connection flange (and below the lower connection flange in the case of differential pressure transmitters). This arrangement must be used in the low-pressure range.

When measuring at pressures above atmospheric, the pressure transmitter can also be installed above the connection flange.

The capillaries between the remote seal and the pressure transmitter should be as short as possible to obtain a good transmission response.

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 will result from the oil filling of the remote seal capillaries. This results in a measuring range offset which has to be taken into account when you set the pressure transmitter.

An offset in the measuring range also occurs when combining a remote seal with a transmitter if the remote seal is not installed at the same height as the transmitter.

Pressure transmitter output

If the level, separation layer or density increase in closed vessels, the differential pressure and hence the output signal of the pressure transmitter also increase.

For an inverted relationship between the differential pressure and the output signal, the lower range value and upper range value of the SITRANS P must be interchanged.

With open vessels, a rising pressure is usually assigned to an increasing level, separation layer or density.

Influence of ambient temperature

Temperature differences between the individual capillaries and between the individual remote seals should be avoided.

Temperature variations in the area of the measuring setup cause a change in volume of the filling liquid and hence measuring errors.

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.

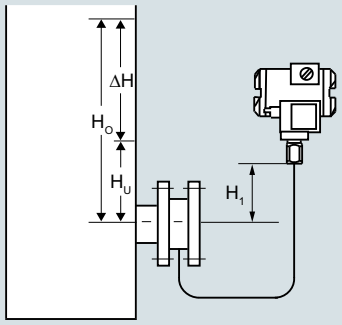
Possible combinations of pressure transmitters and remote seals

Type of installation	Pressure transmitters	Remote seals
A/B	7MF030.-... 7MF031.-... 7MF040.-... 7MF041.-...	7MF0800-... 7MF0810-...
C_1 and C_2	7MF032.-... 7MF042.-...	7MF0800-... 7MF0810-... (negative pressure service in each case)
	7MF033.-... 7MF043.-...	7MF0801-... 7MF0811-...
D	7MF034.-... 7MF035.-... 7MF044.-... 7MF045.-...	7MF0802-... 7MF0812-...
E	7MF034.-... 7MF035.-... 7MF044.-... 7MF045.-...	7MF0813-...
G, H and J	7MF034.-... 7MF035.-... 7MF044.-... 7MF045.-...	7MF0802-... 7MF0812-...

Dimensional drawings

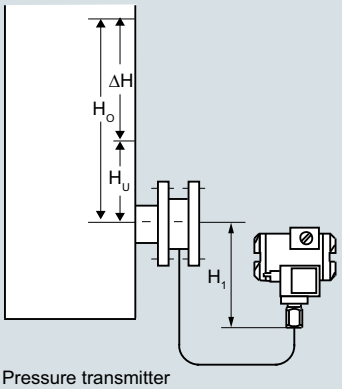
Types of installation for pressure and level measurements (open vessels)

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

Lower range value: $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_1$

Upper range value: $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_1$

Installation type B

Lower range value: $p_{MA} = \rho_{FL} \cdot g \cdot H_U + \rho_{Oil} \cdot g \cdot H_1$

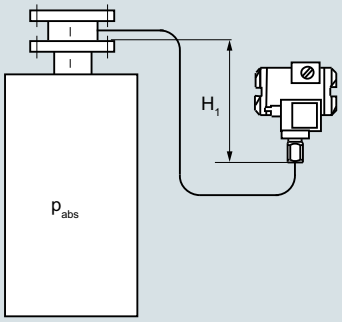
Upper range value: $p_{ME} = \rho_{FL} \cdot g \cdot H_O + \rho_{Oil} \cdot g \cdot H_1$

Legend

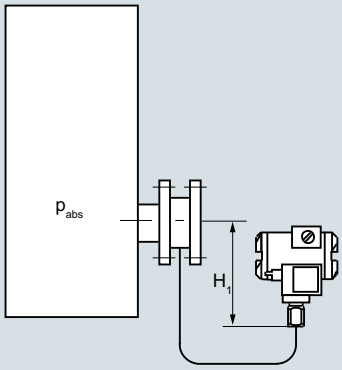
p_{MA}	Lower range value to be set
p_{ME}	Upper range value to be set
ρ_{FL}	Density of medium in vessel
ρ_{Oil}	Density of filling oil in the capillary to the remote seal
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value
H_1	Distance between vessel flange and pressure trans.

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

Lower range value: $p_{MA} = p_{START} + \rho_{Oil} \cdot g \cdot H_1$

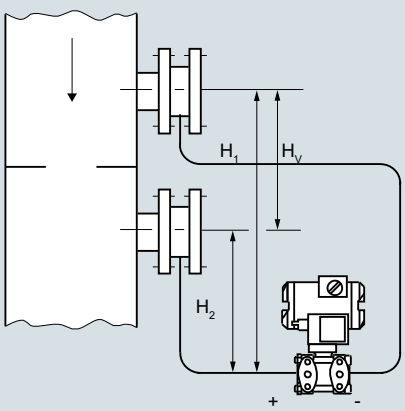
Upper range value: $p_{ME} = p_{END} + \rho_{Oil} \cdot g \cdot H_1$

Legend

p_{MA}	Lower range value to be set
p_{ME}	Upper range value to be set
p_{START}	Lower range value
p_{END}	Upper range 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

Lower range value: $p_{MA} = p_{START} - \rho_{Oil} \cdot g \cdot H_V$

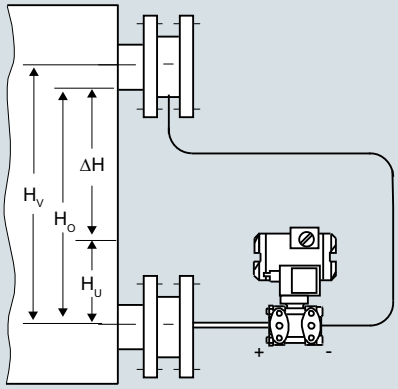
Upper range value: $p_{ME} = p_{END} - \rho_{Oil} \cdot g \cdot H_V$

Legend

p_{MA}	Lower range value to be set
p_{ME}	Upper range value to be set
p_{START}	Lower range value
p_{END}	Upper range 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)

Types of installation for level measurements (closed vessels)

Installation type E



Installation type E

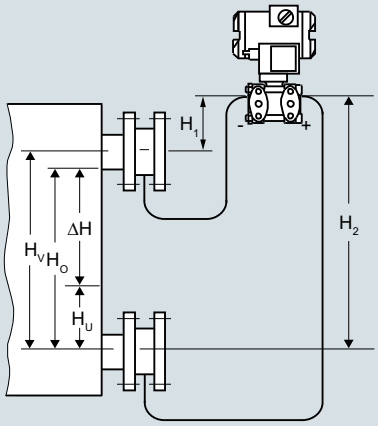
Lower range value: $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

Upper range value: $p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$

Legend

p_{MA}	Lower range value to be set
p_{ME}	Upper range 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	Lower range value
H_O	Upper range value
H_V	Distance between the measuring points (spigots)

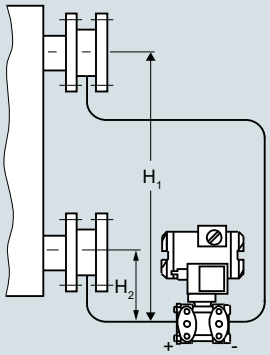
Installation type G



Pressure transmitter for differential pressure above the upper measuring point, no vacuum

$H_2 \leq 7$ m (23 ft), with halocarbon oil as filling liquid only $H_1 \leq 4$ m (13.1 ft)

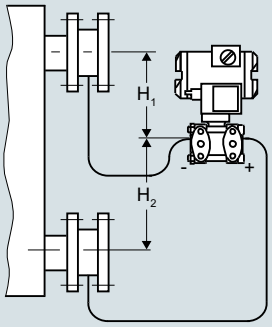
Installation type H



below the lower measuring point

Installation type for vacuum applications

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

Lower range value:
$p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

Upper range value:
$p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$

Legend

p_{MA}	Lower range value to be set
p_{ME}	Upper range 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	Lower range value
H_O	Upper range value
H_V	Distance between the measuring points (spigots)

Measuring setups without remote seals

Overview

Notes

- For the separation layer measurement, the separation layer has to be positioned between the two spigots.

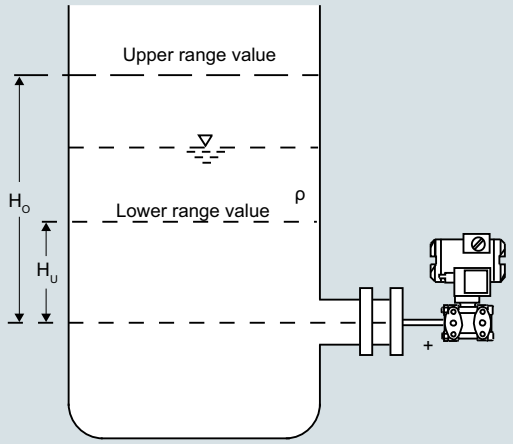
Also you must make sure that the level in the container is always above the top spigot.

- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot

Dimensional drawings

Pressure transmitters for differential pressure, for flanging

Measuring setups for open containers



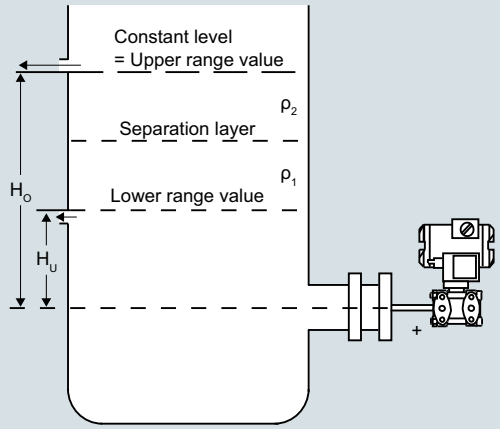
Level measurement

Lower range value: $p_{MA} = \rho \cdot g \cdot H_U$

Upper range value: $p_{ME} = \rho \cdot g \cdot H_O$

Legend

p_{MA}	Lower range value to be set
p_{ME}	Upper range value to be set
ρ	Density of medium in vessel
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value



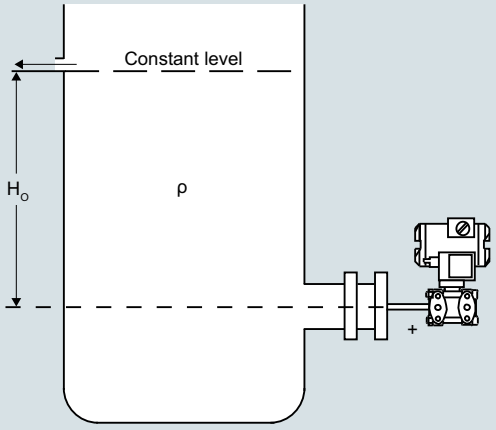
Separation layer measurement

Lower range value: $p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2)$

Upper range value: $p_{ME} = \rho_1 \cdot g \cdot H_O$

Legend

p_{MA}	Lower range value to be set
p_{ME}	Upper range value to be set
ρ_1	Density of heavier liquid
ρ_2	Density of lighter liquid
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value



Density measurement

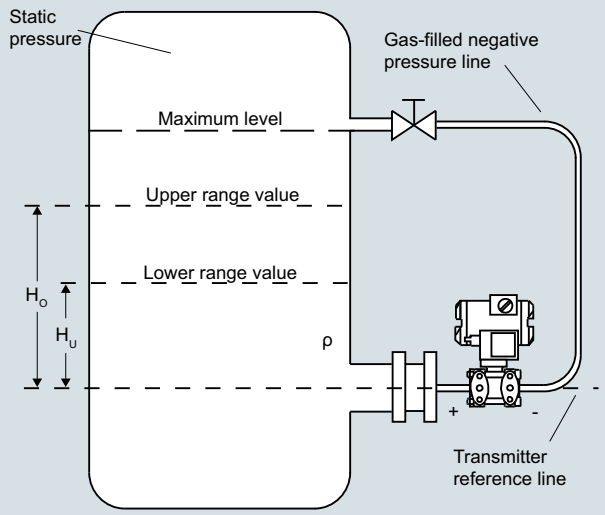
Lower range value: $p_{MA} = \rho_{MIN} \cdot g \cdot H_O$

Upper range value: $p_{ME} = \rho_{MAX} \cdot g \cdot H_O$

Legend

p_{MA}	Lower range value to be set
p_{ME}	Upper range 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	Upper range value in m

Measuring setups for closed containers



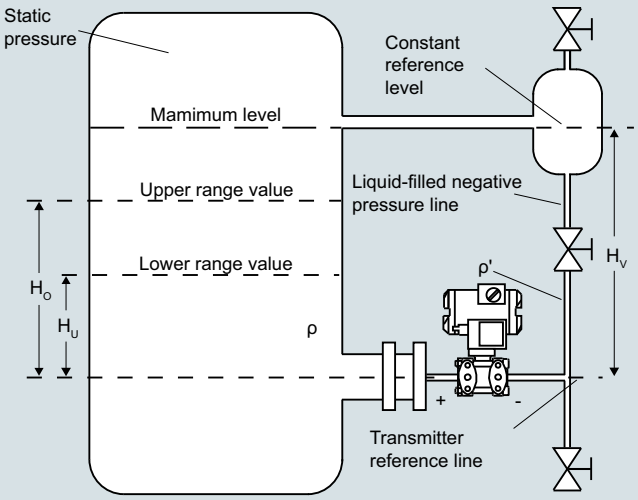
Level measurement, Version 1

Lower range value: $\Delta p_{MA} = \rho \cdot g \cdot H_U$

Upper range value: $\Delta pME = \rho \cdot g \cdot H_O$

Legend

Δp_{MA}	Lower range value to be set
Δp_{ME}	Upper range value to be set
ρ	Density of medium in vessel
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value



Level measurement, Version 2

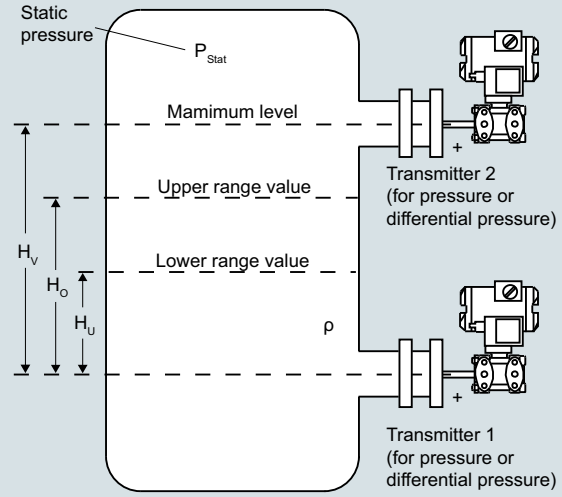
Lower range value: $\Delta p_{MA} = g \cdot (H_U \cdot \rho - H_V \cdot \rho')$

Upper range value: $\Delta p_{ME} = g \cdot (H_O \cdot \rho - H_V \cdot \rho')$

Legend

Δp_{MA}	Lower range value to be set
Δp_{ME}	Upper range 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	Lower range value
H_O	Upper range value
H_V	Distance between the measuring points (spigots)

Measuring setups without remote seals



Level measurement, Version 3

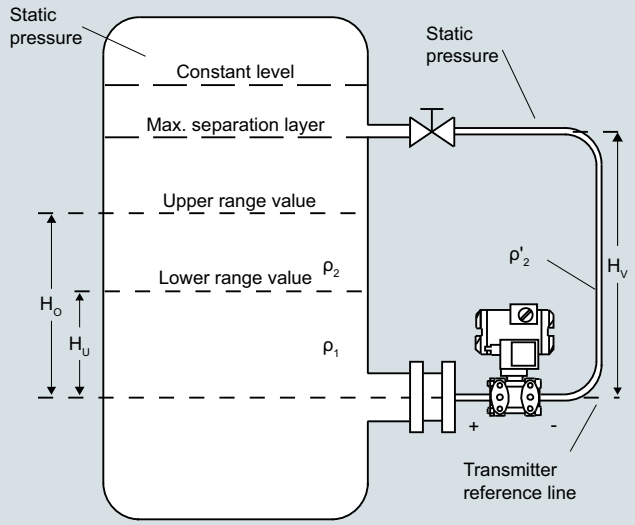
Lower range value: $\Delta p_{MA} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_U}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$

Upper range value: $\Delta p_{ME} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_O}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$

Legend

Δp_{MA}	Lower range value to be set
Δp_{ME}	Upper range value to be set
ρ	Density of medium in vessel
g	Local acceleration due to gravity
H_U	Lower range value
H_O	Upper range value
H_V	Distance between the measuring points (spigots)

The pressure measuring range (≙ level) will be calculated by subtraction of measuring range of transmitter 1 minus measuring range of transmitter 2 in the process control system.



Separation layer measurement

Lower range value: $\Delta p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2 - H_V \cdot \rho'_2)$

Upper range value: $\Delta p_{ME} = g \cdot (H_O \cdot \rho_1 - H_V \cdot \rho'_2)$

Legend

Δp_{MA}	Lower range value to be set
Δp_{ME}	Upper range 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	Lower range value
H_O	Upper range value
H_V	Distance between the measuring points (spigots)

Application

The remote seals 7MF48.. can be fitted to SITRANS P transmitters for

- ***pressure*** (SITRANS P300, P310, DSIII and P410),
- ***absolute pressure*** (SITRANS P300 and DSIII) and
- ***differential pressure and flow*** (SITRANS P310, DSIII, P410 and P500).

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.

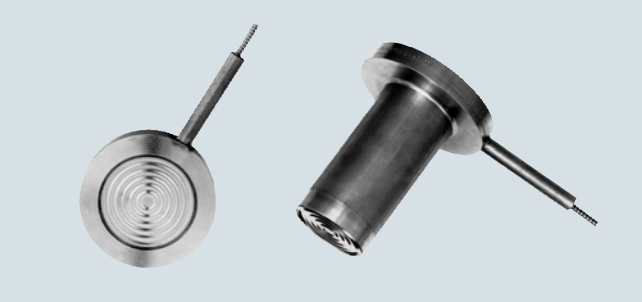
Constructional designs

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.

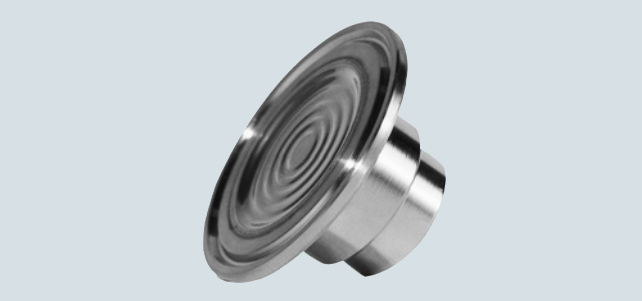
With the inline seals, the pressure is measured via a cylindrical diaphragm positioned in a pipe, and transmitted to the transmitter via the filling liquid.

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.

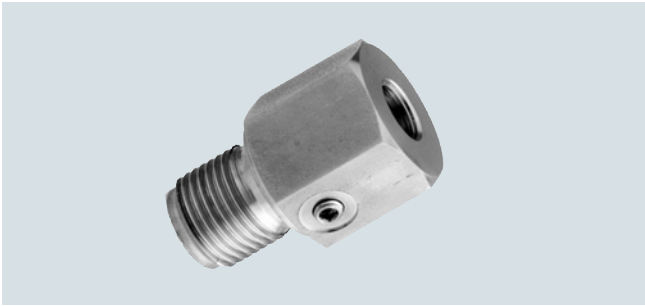
Capillary length:
The capillary length has a proportional effect on the response time and the temperature error.

Measuring system pressure:
The response time decreases as the pressure in the measuring system increases.

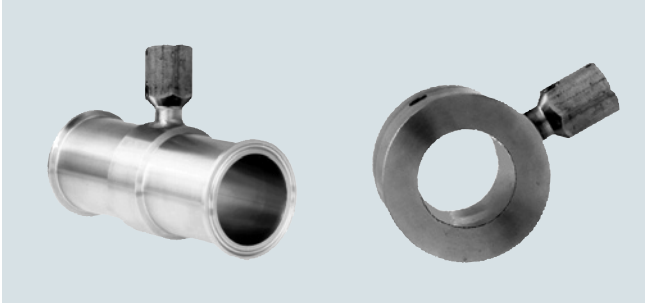
Recommendations

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 1/403 and 1/404.

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 specifications

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 (food oil)
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.

Technical description

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

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 1/403 and 1/404)
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 1/403 and 1/404)
t_{TR}	Ambient temperature on transmitter
f_{PF}	Temperature error of oil filling in process flanges of transmitter (see tables on pages 1/403 and 1/404)

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 1/403 and 1/404 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 1/403 and 1/404
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%
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.

Technical description

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)
Silicone oil DC704	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) (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)
Neobee M20	0.917	(0.033)	+60 +20 - 20	(140) (68) (68)	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)

Technical specifications 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)
Silicone oil DC704	-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)

Maximum temperature of medium

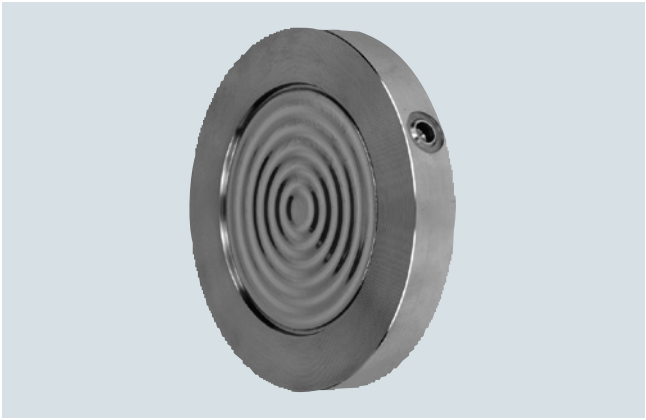
The following maximum temperatures of the medium apply depending on the wetted parts materials:

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)
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)

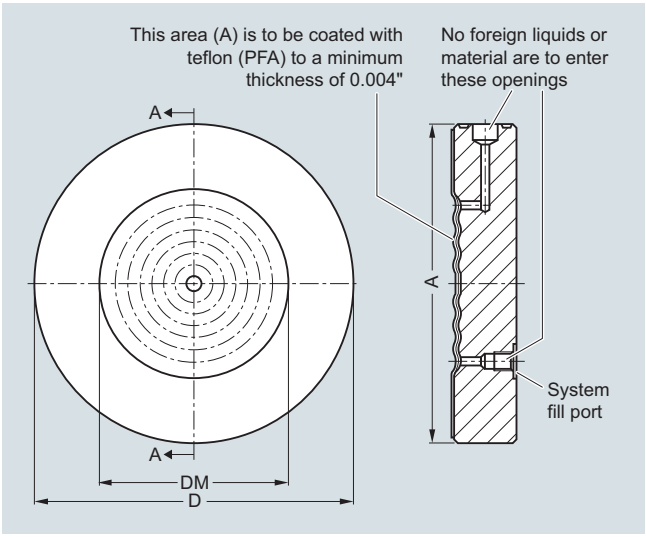
Nominal diameter		Max. length of capillary			
		Diaphragm seal		Inline seal	
DN 25	(1 inch)	2.5 m	(8.2 ft)	2.5 m	(8.2 ft)
DN 32	(1¼ inch)	2.5 m	(4.9 ft)	2.5 m	(8.2 ft)
DN 40	(1½ inch)	4 m	(13.1 ft)	6 m	(19.7 ft)
DN 50	(2 inch)	6 m	(19.7 ft)	10 m	(32.8 ft)
DN 65	(2½ inch)	8 m	(26.2 ft)	10 m	(32.8 ft)
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)	–	–

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

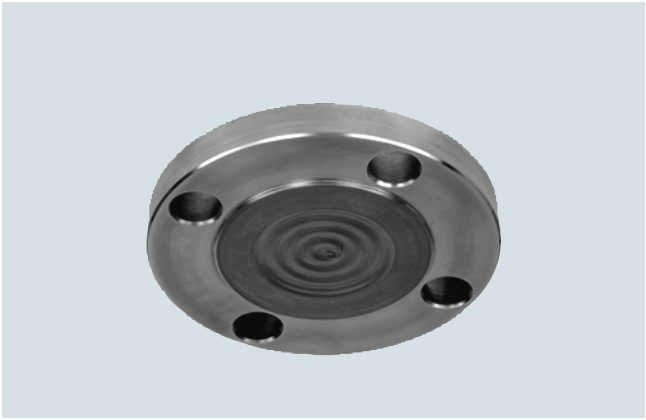
Size = Nominal pipe size
DM = Effective diaphragm diameter
Class = Flange rating per ASME B16.5
All dimensions in inches unless otherwise noted

Selection and Ordering data

	Article No.	Order code
Pancake type diaphragm seal with flexible capillary extension, connected to a SITRANS P transmitter (order separately)		
for pressure 7MF40 ■■ or 7MF42 ■■ ↗	7MF4800-	
for absolute pressure 7MF43 ■■ ↗	7MF4801-	
for differential pressure 7MF44 ■■ ↗	7MF4803-	
• dual seals for DP	1■■■■-■B	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
• 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 information to be supplied	Z	J 1 Y
Materials and wetted parts		
• SST 316L	A	
• 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 J
Extension length (316SS standard)		
Without extension (standard version)	0	
Special design, customer information to be supplied for extension	9	L 1 Y
System fill		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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		
• 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	N 1 Y
Further designs Please add **„-Z“** to Article No. and specifiy Order code		
for 7MF4800		
Integrated flame path restriction		A 0 1
Certificate 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
for 7MF4801		
Integrated flame path restriction		A 0 1
Certificate of calibration N.I.S.T. (20% steps)		C 1 1
Material conformance certificate		C 1 2
Calculation of span of transmitter (completed questionnaire to be attached)		Y 0 5
for 7MF4803		
Integrated flame path restriction		A 0 2
Certificate 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

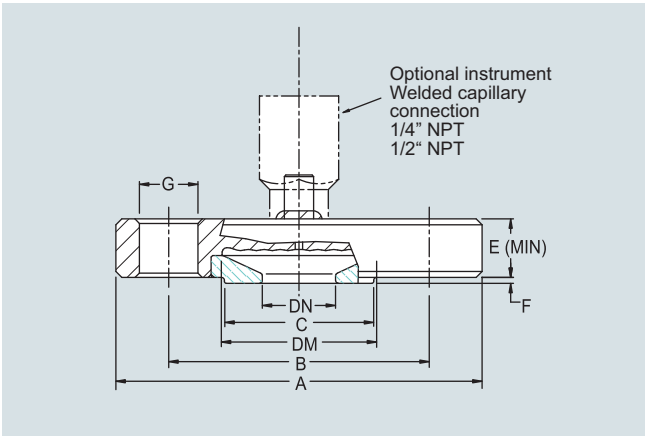
Flange-type diaphragm seal directly connected

Overview

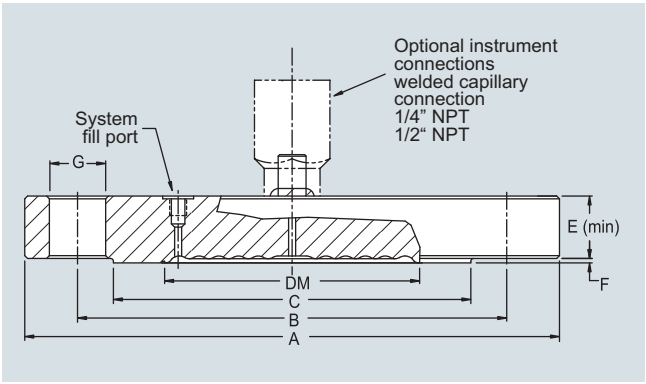


Flange-type diaphragm seal, without extension

Dimensions (connection to ASME B16.5)



Flange-type diaphragm seal without extension for flanges ≤ 1"



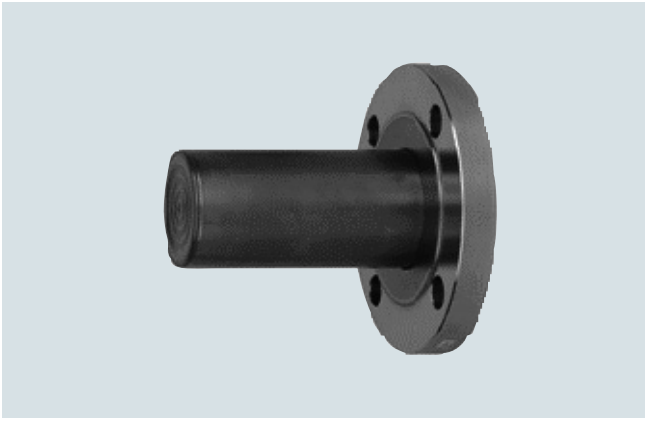
Flange-type diaphragm seal without extension for flanges ≥ 1.5"

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

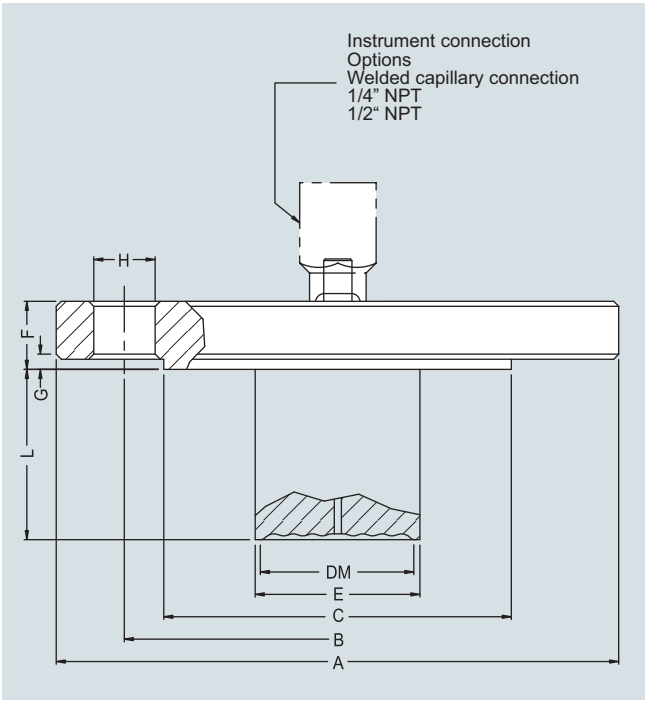
Flange-type diaphragm seal, without extension, dimensions

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

Article No. Order code

Flange-type diaphragm seal

directly connected to a SITRANS P 7MF40 ■■ or 7MF42 ■■ (order separately) ↗ **7 M F 4 8 1 0 -** ■ ■ ■ ■ ■ ■ ■ ■ ■

↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

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**
• 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

• Silicone oil DC 200-10	**1**
• Silicone oil DC 200-50	**2**
• 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 Article 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**

Flange-type diaphragm seal with extension

Selection and Ordering data	Article No.	Order code
Mounting flange		
directly mounted at SITRANS P for Level 7MF46 ■■ (order separately)	↗ 7MF4812-3■■■■	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Flange / Size / Class		
ANSI B16.5 / 2 inch / 150	L	
ANSI B16.5 / 2 inch / 300	M	
ANSI B16.5 / 3 inch / 150	Q	
ANSI B16.5 / 3 inch / 300	R	
ANSI B16.5 / 4 inch / 150	T	
ANSI B16.5 / 4 inch / 300	U	
Special design, customer information to be supplied	Z	J1Y
Materials and wetted parts		
• SST 316L	A	
• 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 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	L1Y
System fill		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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
Further designs Please add „-Z" to Article No. and specifiy Order code		
Integrated flame path restriction		A01
Rotatable Flange		B01
Certificates: Certification of calibration N.I.S.T. (20% steps)		C11
Material conformance certificate		C12
Vacuum service (must be specified with HT oil)		V04
Calculation of span of transmitter (completed questionnaire to be attached)		Y05

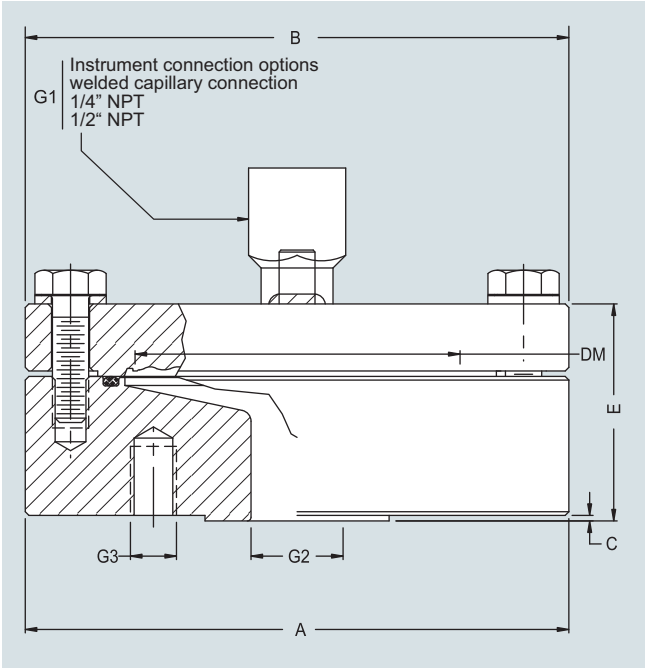
Selection and Ordering data	Article No.	Order code
Mounting flange at High-Side, Flange-Type Seal, w/o extension Flange-type seal via capillary extension on low-side without extension		
for SITRANS P for differential pressure 7MF44 ■■ (order separately)	↗ 7MF4813-1■■■■-■B	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Flange / Size / Class		
ANSI B16.5 / 2 inch / 150	L	
ANSI B16.5 / 2 inch / 300	M	
ANSI B16.5 / 3 inch / 150	Q	
ANSI B16.5 / 3 inch / 300	R	
ANSI B16.5 / 4 inch / 150	T	
ANSI B16.5 / 4 inch / 300	U	
Special design, customer information to be supplied	Z	J1Y
Materials and wetted parts		
• SST 316L	A	
• 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 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	L1Y
System fill		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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
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 Article No. and specifiy Order code		
Integrated flame path restriction		A02
Rotatable Flange		B01
Certification of calibration N.I.S.T. (20% steps)		C11
Material conformance certificate		C12
Vacuum service (must be specified with HT oil)		V04
Calculation of span of transmitter (completed questionnaire to be attached)		Y05

Overview

Diaphragm seal "flanges off-line low-pressure type"

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

Dimensions (Connection to ASME B16.5)



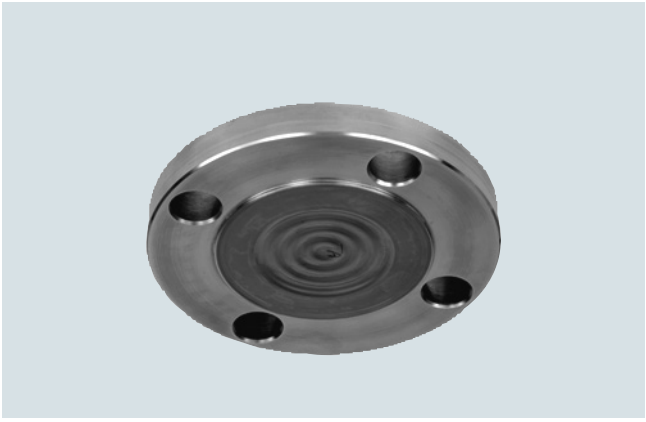
G2		G3	X	A	B	C	DM	E
Size	Class							
½"	150#	½"-13UNC	4	5.91		0.06		2.36
½"	300#	½"-13UNC	4	5.91		0.06		2.36
½"	600#	½"-13UNC	4	5.91		0.25		2.55
¾"	150#	½"-13UNC	4	5.91		0.06		2.36
¾"	300#	5/8"-11UNC	4	5.91		0.06		2.36
¾"	600#	5/8"-11UNC	4	5.91		0.25		2.55
1"	150#	½"-13UNC	4	5.91		0.06		2.36
1"	300#	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

1

Diaphragm seal "flanged off-line low-pressure type", directly connected

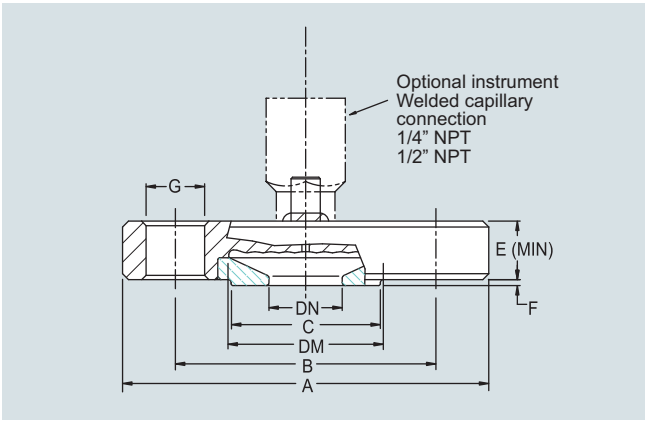
Selection and Ordering data	Article No.	Order code
Diaphragm seal "flanged off-line low-pressure type"		
direct mount to transmitter, 316 stainless steel ↗ upper housing SITRANS P for 7MF44 ■ ■ or 7MF46 ■ ■ (order separately)	7 M F 4 8 1 4 - 3 ■ ■ ■ ■	■ ■ ■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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	
• 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		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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 Article 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

Overview

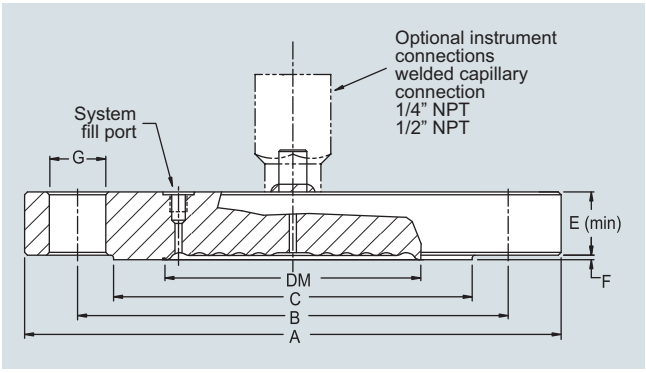


Flange-type diaphragm seal with flexible capillary extension

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

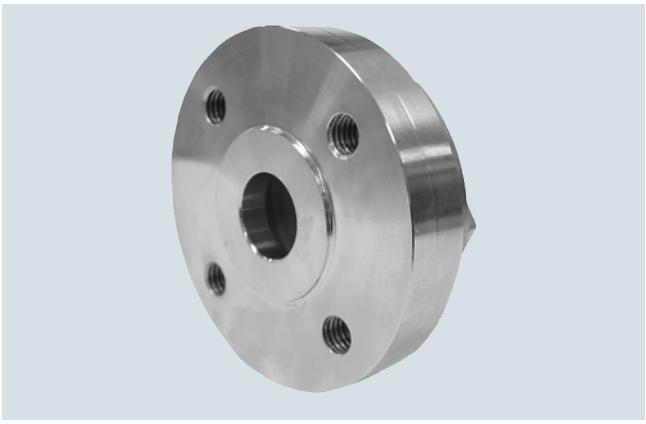
1

Flange-type diaphragm seal with flexible capillary tube

Selection and Ordering data	Article No.	Order code
Flange-type diaphragm seal		
with flexible capillary extension, connected to a SITRANS P transmitter (order separately)		
for pressure 7MF40 ■■ or 7MF42 ■■ ↗	7MF4820-	
for absolute pressure 7MF43 ■■ ↗	7MF4821-	
for differential pressure 7MF44 ■■ ↗	7MF4823-	
• dual seals for DP	1■■■■-■B	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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	J 1 Y
Materials and wetted parts		
• SST 316L	A	
• 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	
Special design, customer information to be supplied for extension	9	L 1 Y
System fill		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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

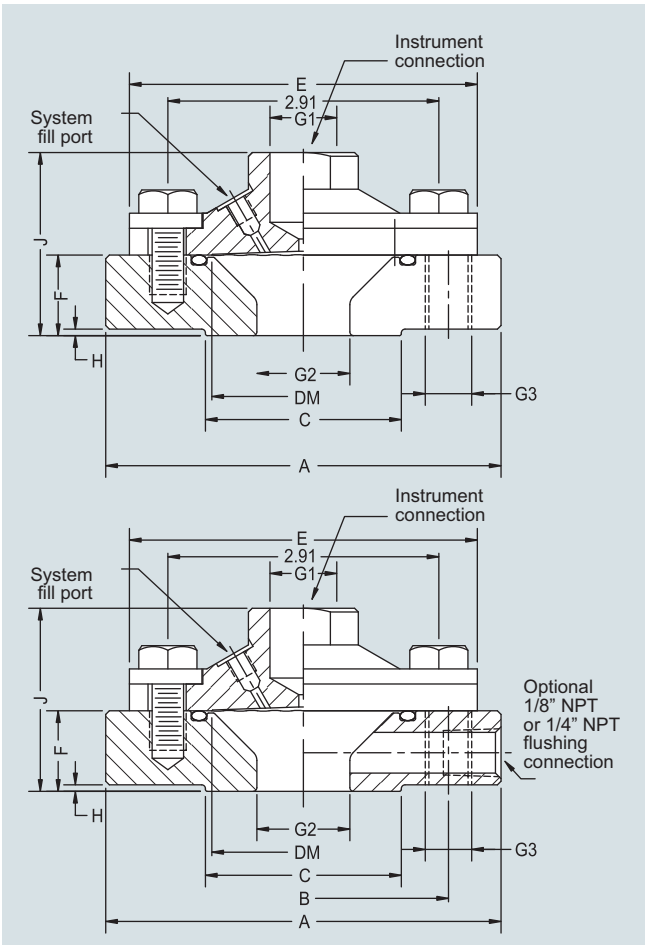
Selection and Ordering data	Order code
Further designs	
Please add **„-Z“** to Article No. and specifiy Order code	
for 7MF4820	
Integrated flame path restriction	A 0 1
Rotatable Flange	B 0 1
DP "H" flange service	B 0 2
Certificate of calibration N.I.S.T. (20 % steps)	C 1 1
Material conformance certificate	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
for 7MF4821	
Integrated flame path restriction	A 0 1
Rotatable Flange	B 0 1
Certificate of calibration N.I.S.T. (20 % steps)	C 1 1
Material conformance certificate	C 1 2
Calculation of span of transmitter (completed questionnaire to be attached)	Y 0 5
for 7MF4823	
Integrated flame path restriction	A 0 2
Rotatable Flange	B 0 1
Certificate 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

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

1

Diaphragm seal "flanged off-line type"

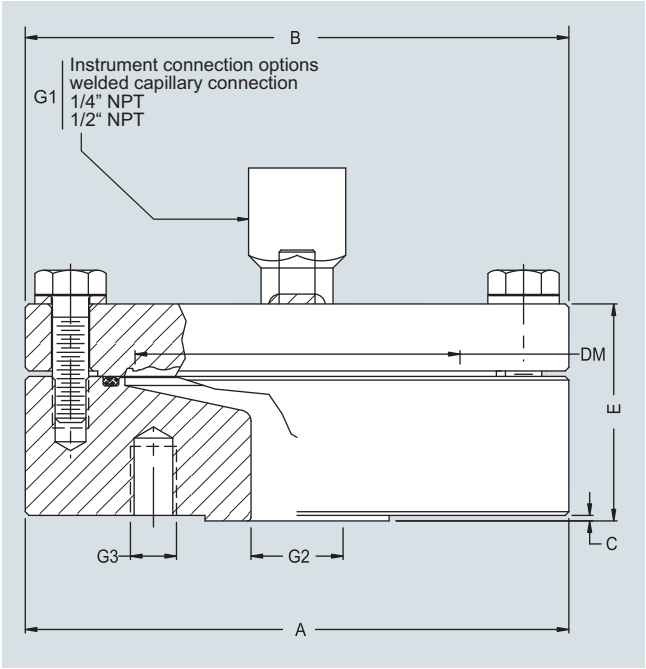
Selection and Ordering data	Article No.	Order code
Diaphragm seal "flanged off-line type" MAWP depends on flange		
with flexible armored capillary, 316 stainless steel upper housing SITRANS P for 7MF40 ■■ and 7MF42 ■■ (order separately)	7MF4826-■■■■■-■B	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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	
• 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		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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	Article No.	Order code
Further designs Please add **„-Z“** to Article 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

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

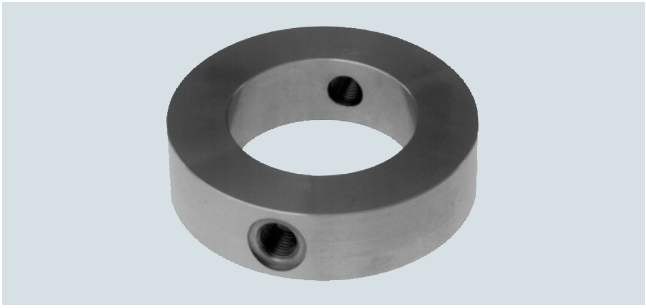
1

Diaphragm seal "flanged off-line low-pressure type"

Selection and Ordering data	Article 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)	7MF4827-1■■■■-■B	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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	
• 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		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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 Article 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

Selection and Ordering data	Article 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)	7MF4828-1■■■■-■B	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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	
• 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		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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 Article 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

Overview



Flushing ring

Flushing rings are required for flange-mounted and pancake type remote seals (Article 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.

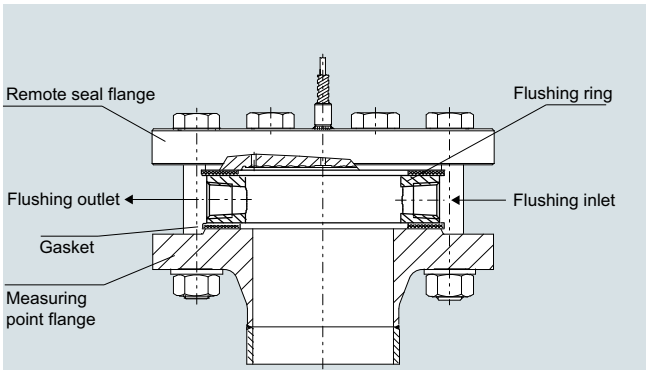
Process connection

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

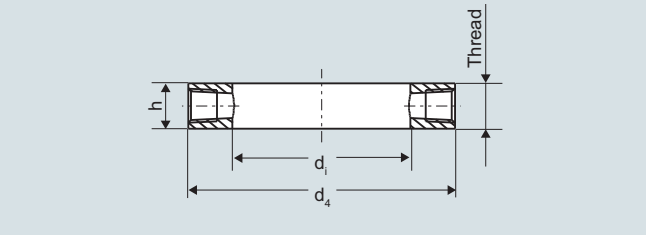


Installation example

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

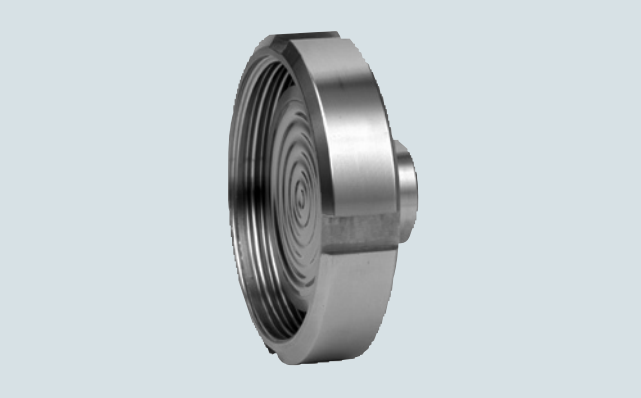
DN	Class	d_4		d_i		h		Weight	
inch		mm	(inch)	mm	(inch)	mm	(inch)	kg	(lb)
2	150 ... 600	92	(3.62)	62	(2.44)	30	(1.18)	0.60	(1.32)
3	150 ... 600	127	(5)	92	(3.62)	30	(1.18)	1.05	(2.31)
4	150 ... 600	157	(6.18)	92	(3.62)	30	(1.18)	2.85	(6.28)
5	150 ... 600	185.5	(7.3)	126	(4.96)	30	(1.18)	3.30	(7.28)

Flushing ring, dimension drawing

Flushing rings

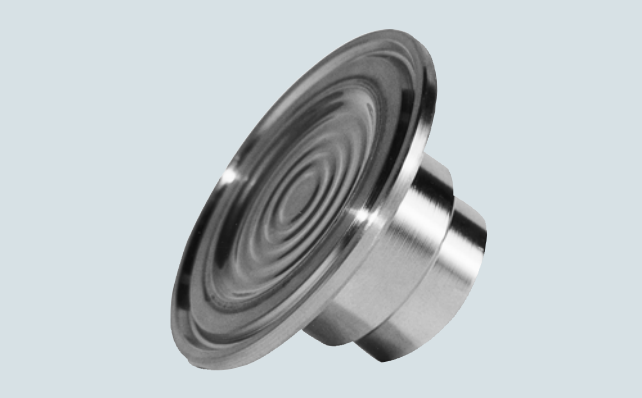
Selection and Ordering data		Article No. Ord. code
Flushing ring	↗	**7 M F 4 8 2 5 -**
for remote seals 7MF4900 to 7MF4923		**1**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Nom. diam.	**Nom. press.**	
• 2 inch	Class 150 ... 600	**G**
• 3 inch	Class 150 ... 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 Article No. and specifiy Order code		
Acceptance test certificate B to EN 10204, section 3.1.B		**C 1 2**

Overview



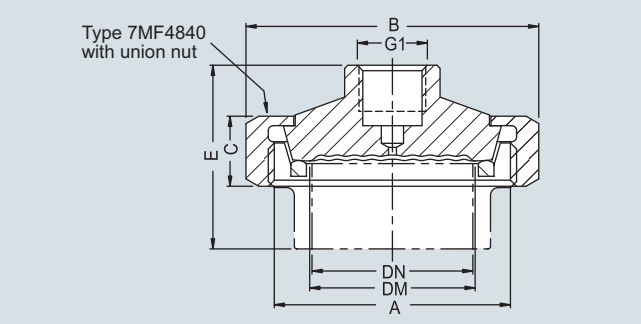
Diaphragm seal with quick connection, with slotted union nut

Overview



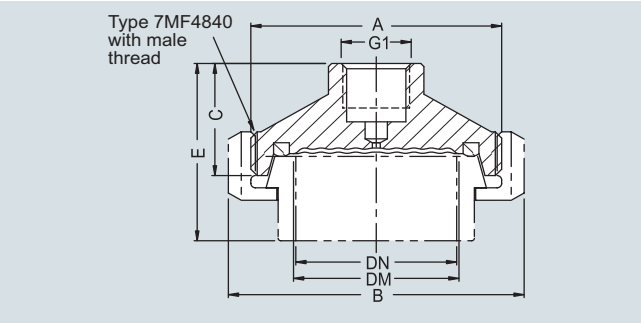
Diaphragm seal with quick connection, Tri-Clamp connection

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

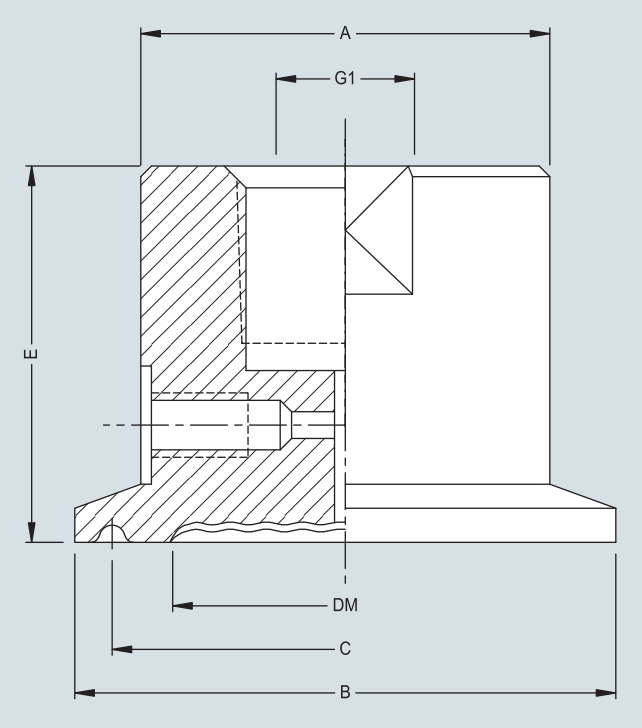


DN [mm]	MAWP [psi]	A [mm]	B	C	DM	E	G1	Weight [lbs]
40	600	Rd 65 x 1/6	3.07	1.12	1.6	2.17	¼"-NPT or ½"-NPT female	2.8
50	360	Rd 78 x 1/6	3.62	1.42	2.1	2.24		3.0

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

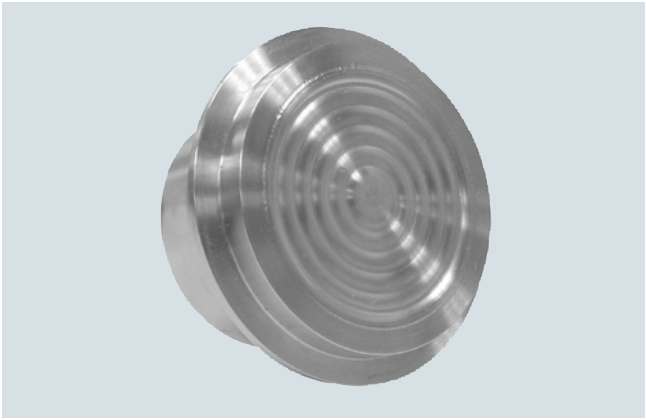
DM = Effective diaphragm diameter
MAWP = Maximum Working Pressure @ 250 °F, higher rating with appropriate clamping device
G1 = Instrument connection
Size = Nominal pipe size
All dimensions in inches unless otherwise noted

Diaphragm seal with quick connection, Tri-Clamp connection, dimensions

1

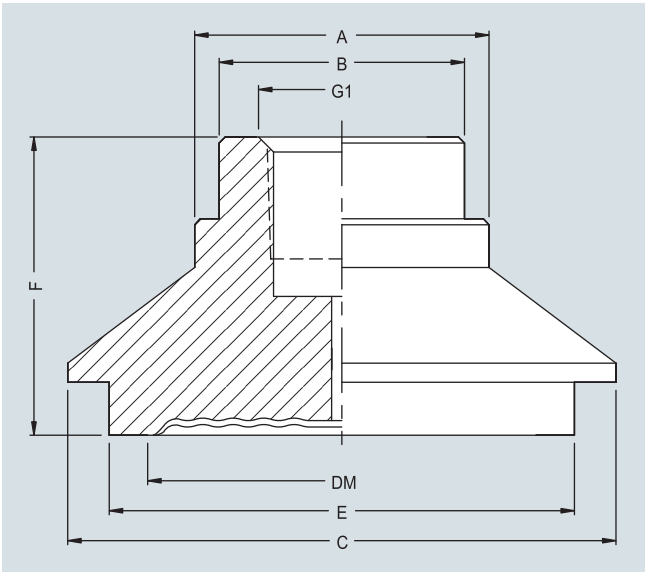
Inline diaphragm seal with quick connection

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

	Article No.	Order code
Diaphragm seal		
with quick connection for gage pressure transmitter SITRANS P 7MF40 ■■ and 7MF42 ■■ (order separately) made of 316 SS	7MF4840-	
	■■A0■-■B	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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 Article 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

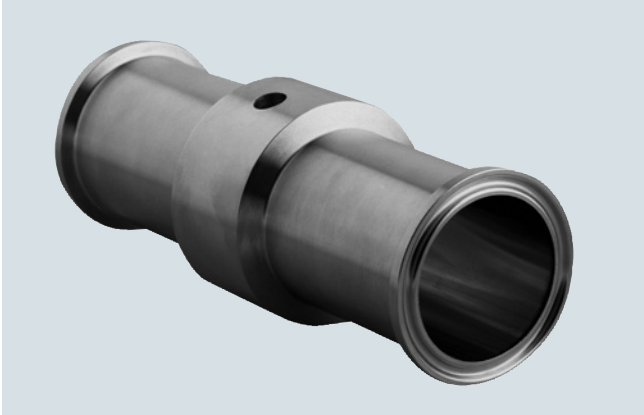
Selection and Ordering data	Article No.	Order code
Diaphragm seal		
with quick connection for differential transmitter SITRANS P 7MF44 ■ ■ (order separately) made of 316 SS ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7 M F 4 8 4 3 - ■ ■ A 0 ■ - ■ B	■ ■ ■
Process connection		
DIN 11 851 with slotted union nut		
DN 50/PN 25	1 E	
DN 65/PN 25	1 F	
DN 80/PN 25	1 G	
DIN 11 851 with screw necks		
DN 50/PN 25	2 E	
DN 65/PN 25	2 F	
DN 80/PN 25	2 G	
Tri-Clamp Connection		
2" 550 psi	4 M	
2 ½" 450 psi	4 N	
3" 350 psi	4 P	
4" 250 psi	4 Q	
"I"-Line (Cherry Burrell - male)		
3" 350 psi	5 W	
4" 200 psi	5 X	
Sanitary (4" Tank Spud)		
2" extension	6 B	
6" extension	6 D	
Special design, customer information to be supplied	9 Z	H 1 Y + J 1 Y
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	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 Article No. and specifiy Order code		
Certification of calibration N.I.S.T. (20 % steps)		C 1 1
Material conformance certificate		C 1 2
Vacuum service (must be specified with vegetable oil)		V 0 3
Calculation of span of transmitter (completed questionnaire to be attached)		Y 0 5
Tank Spud accessories		
Sanitary Tank Spud Clamp (1 pc., two required)		P 1 0
Sanitary Tank Spud O-ring (1 pc., two required)		P 1 1
Sanitary Tank Spud Weldolet 2" extension (1 pc., two required)		P 1 2
Sanitary Tank Spud Weldolet 6" extension (1 pc., two required)		P 1 3

Inline diaphragm seal with quick connection

Overview

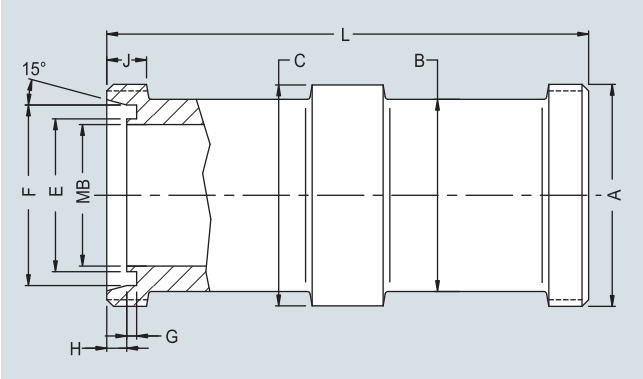
Inline diaphragm seal with quick connector, DIN 11851 with thread

Overview



Inline diaphragm seal with quick connection, Tri-clamp

Dimensions (connection to ASME B16.5)

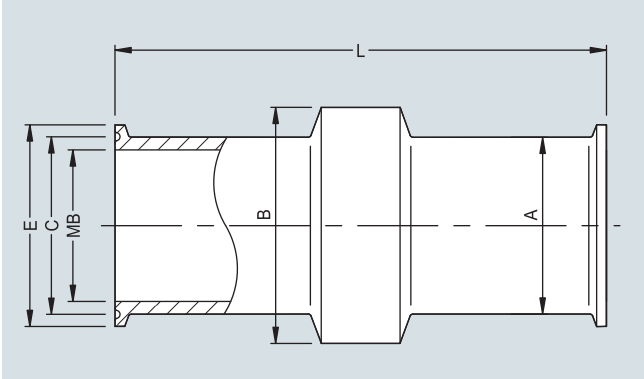


DN [mm]	MAWP [psi]	A	B	C	E	G	H	J	L	MB
15	600	Rd34x1/8	1.10	1.57	0.71	0.12	0.16	0.47	4.1	0.63
25	600	Rd52x1/6	1.50	2.05	1.18	0.14	0.28	0.55	5.0	1.02
40	600	Rd65x1/6	2.17	2.56	1.65	0.14	0.28	0.55	6.3	1.50
50	360	Rd78x1/6	2.68	3.07	2.13	0.14	0.28	0.55	6.7	1.97
65	360	Rd95x1/6	3.35	3.74	2.80	0.14	0.31	0.63	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

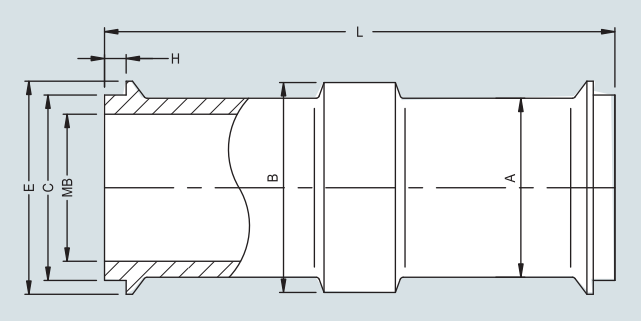
MB = Internal diameter
MAWP = Maximum Working Pressure @ 250 °F, higher rating with appropriate clamping device
Size = Nominal pipe size
All dimensions in inches unless otherwise noted

Inline diaphragm seal with quick connection, Tri-clamp, dimensions

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

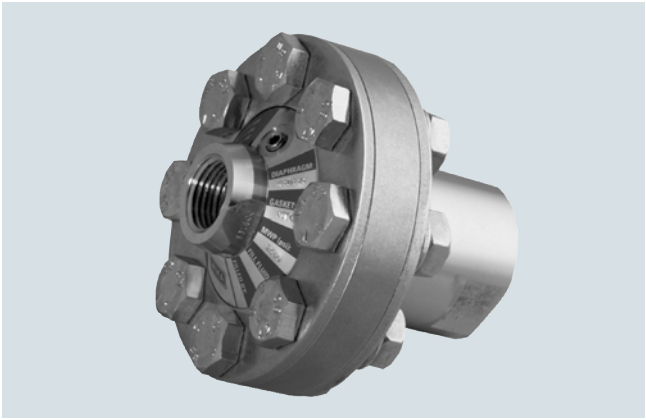
Inline diaphragm seal with quick connection, "i"-Line (Cherry Burrell - male/male), dimensions

Selection and Ordering data

	Article No.	Order code
Inline diaphragm seal		
with quick connection for transmitter SITRANS P for 7MF40 ■■ and 7MF42 ■■ (order separately) made of 316 SS	7MF4850-	
	■■A0■-■B	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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 Article 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

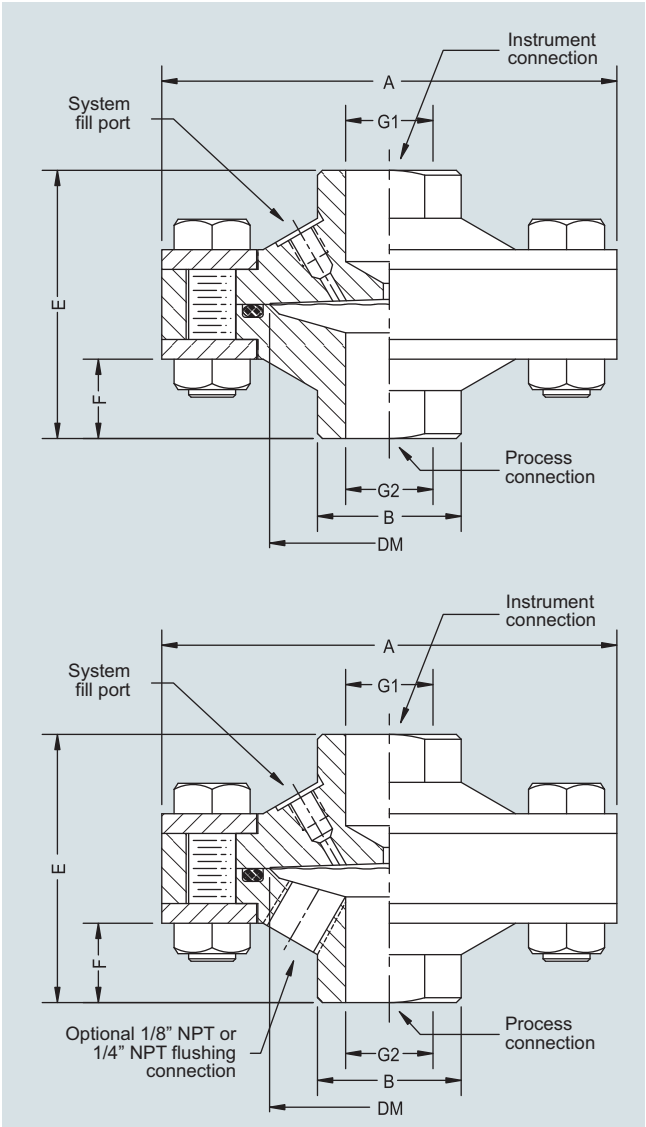
Diaphragm seal "threaded design"

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

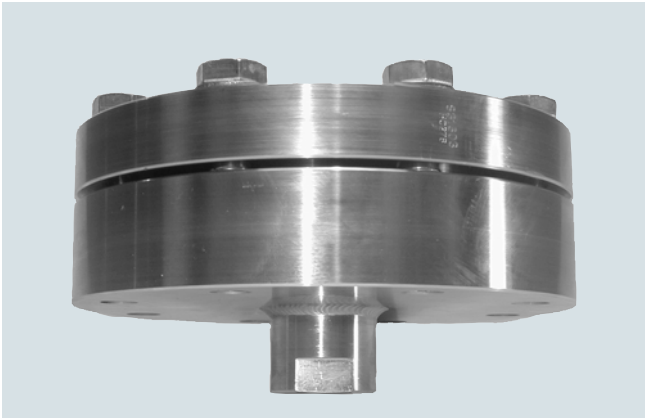
G1 = Instrument connection, G2 = Process connection
DM = Effective diaphragm diameter
All dimensions in inches unless otherwise noted

Diaphragm seal "threaded design"

Selection and Ordering data

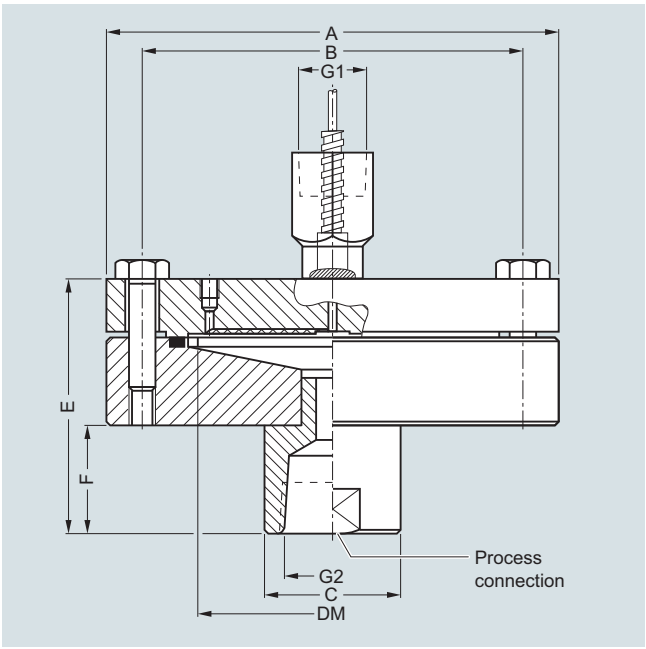
	Article No.	Order code
Diaphragm seal "threaded design" MAWP 3675 psi		
with flexible armored capillary, 316 stainless steel upper housing SITRANS P for 7MF40■■ and 7MF42■■ pressure (order separately) ↗	7MF4861-1■■■■-■B	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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 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		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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 inform. to be supplied	9	N 1 Y
Further designs Please add **„-Z"** to Article 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

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

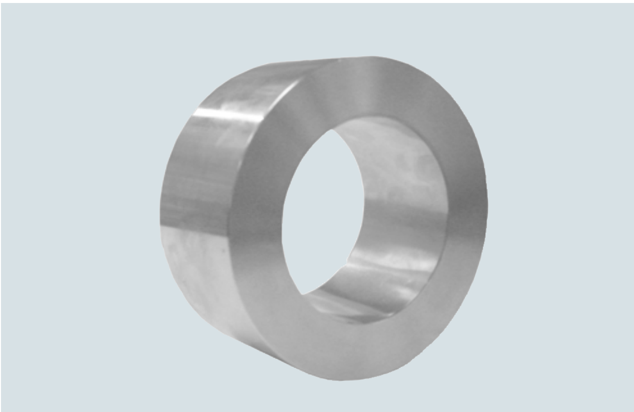
Selection and Ordering data

Selection and Ordering data	Article 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)	7MF4862- 1■■■■-■B	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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 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		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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 Article 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

Diaphragm seal "threaded, low-pressure design"

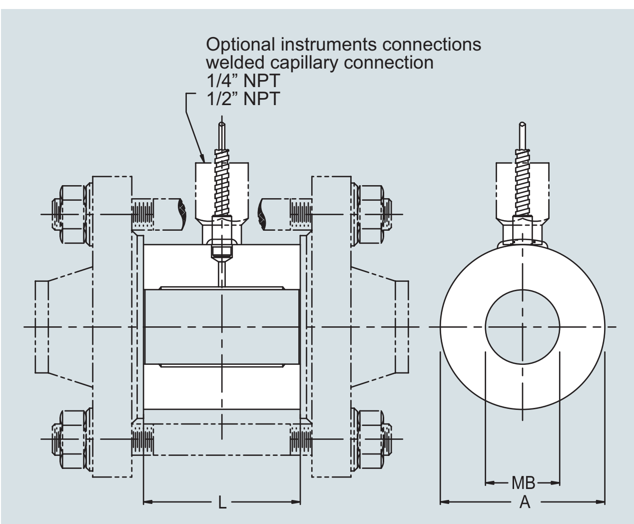
Selection and Ordering data	Article No.	Order code
Diaphragm seal "threaded, low-pressure design" MAWP 1,500 psi		
with flexible armored capillary, 316 stainless steel upper housing SITRANS P for 7MF44 ■■ (order separately)	7 M F 4 8 6 3 - 1 ■■■■ - ■ B	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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 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	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		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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 Article 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

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

Selection and Ordering data	Article No.	Order code
Inline diaphragm seals wafer assembled to		
SITRANS P for 7MF40 ■ ■ and 7MF42 ■ ■ (order separately) ↗	7 M F 4 8 8 0 - 1 ■ ■ 0 ■ - ■ B	■ ■ ■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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 Article 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

Inline diaphragm seal, wafer for pressure

Selection and Ordering data	Article No.	Order code
Inline diaphragm seals wafer assembled to		
SITRANS P for 7MF44 ■ ■ (order separately) ↗	7 M F 4 8 8 3 -	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	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		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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 Article 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

Overview

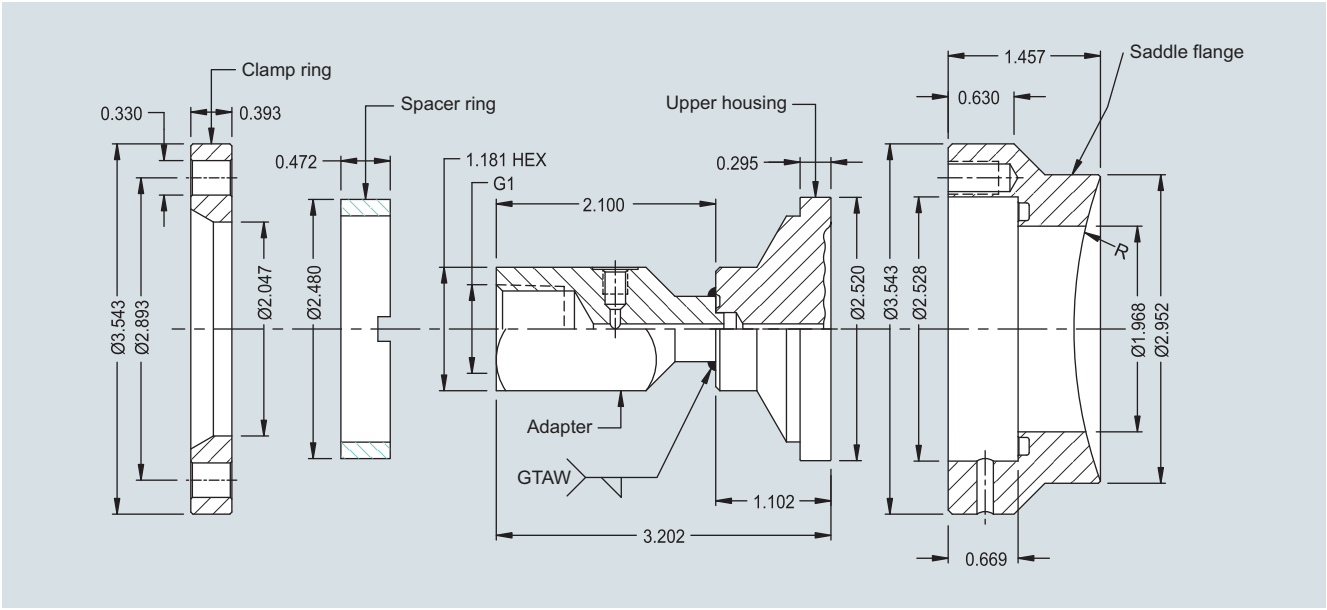
Diaphragm seal, saddle

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



Diaphragm seal, saddle

Selection and Ordering data	Article No.	Order code
Diaphragm seal, saddle, MAWP 1,500 psi		
with flexible armored capillary or direct mount, ↗ 316 stainless steel upper housing and assemply hardware SITRANS P for 7MF40 ■■ or 7MF42 ■■ (order separately)	7 M F 4 8 9 0 - 1 ■■■■ - ■B	■■■
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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 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		
• Silicone oil DC 200-10	1	
• Silicone oil DC 200-50	2	
• 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 Article 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

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.

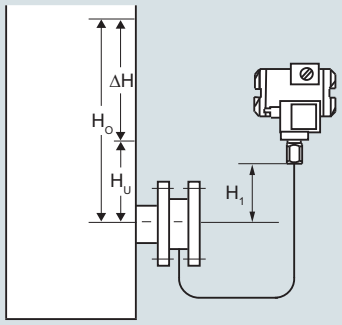
Possible combinations of transmitter and remote seal

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**	

Dimensional drawings

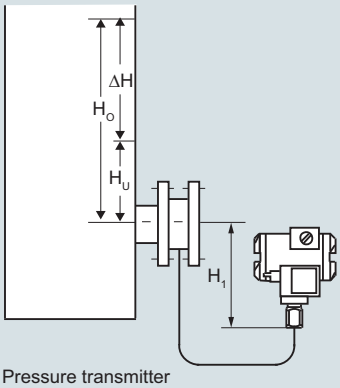
Types of installation for pressure and level measurements (open vessels)

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: $p_{MA} = \rho_{FL} \cdot g \cdot H_U + \rho_{Oil} \cdot g \cdot H_1$

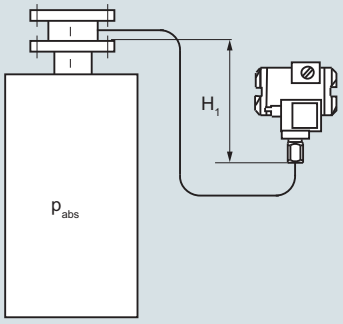
Full-scale: $p_{ME} = \rho_{FL} \cdot g \cdot H_O + \rho_{Oil} \cdot g \cdot H_1$

Legend

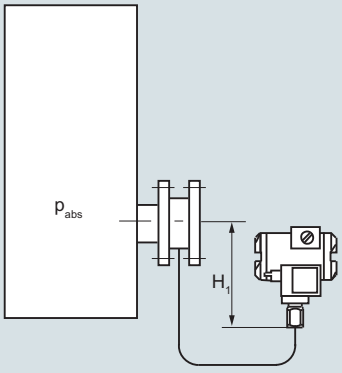
p_{MA}	Start-of-scale value to be set
p_{ME}	Full-scale value to be set
ρ_{FL}	Density of medium in vessel
ρ_{Oil}	Density of filling oil in the capillary to the remote seal
g	Local acceleration due to gravity
H_U	Start-of-scale value
H_O	Full-scale value
H_1	Distance between vessel flange and pressure 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: $p_{MA} = p_{START} + \rho_{Oil} \cdot g \cdot H_1$

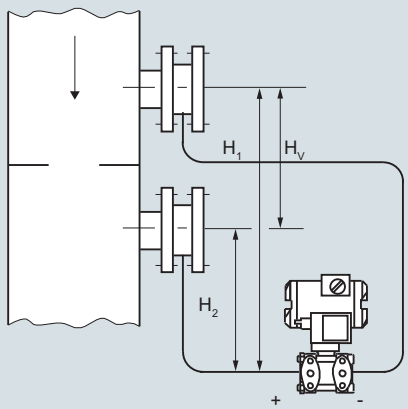
Full-scale: $p_{ME} = p_{END} + \rho_{Oil} \cdot g \cdot H_1$

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: $p_{MA} = p_{START} - \rho_{Oil} \cdot g \cdot H_V$

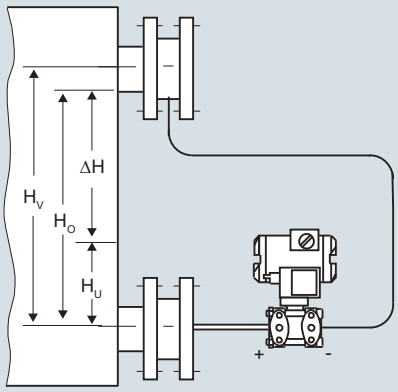
Full-scale: $p_{ME} = p_{END} - \rho_{Oil} \cdot g \cdot H_V$

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)

Types of installation for level measurements (closed vessels)

Installation type E



Installation type E

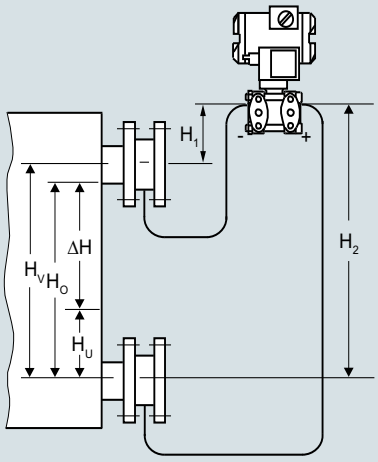
Start-of-scale: $p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$

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)

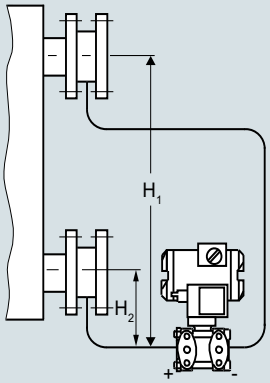
Installation type G



Pressure transmitter for differential pressure above the upper measuring point, no vacuum

$H_2 \leq 7$ m (23 ft), with halocarbon oil as filling liquid only $H_1 \leq 4$ m (13.1 ft)

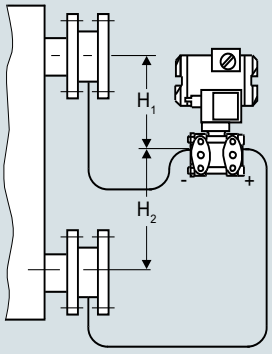
Installation type H



below the lower measuring point

Installation type for vacuum applications

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	g	Local acceleration due to gravity
p_{ME}	Full-scale value to be set	H_U	Start-of-scale value
ρ_{FL}	Density of medium in vessel	H_O	Full-scale value
ρ_{Oil}	Density of filling oil in the capillary to the remote seal	H_V	Distance between the measuring points (spigots)

Measuring setups without remote seals

Overview

Notes

- For the separation layer measurement, the separation layer has to be positioned between the two spigots.

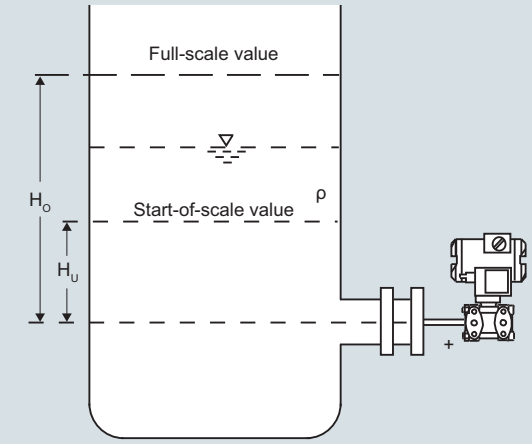
Also you must make sure that the level in the container is always above the top spigot.

- When measuring density, make sure that the level of the medium remains constant. The level should be above the top spigot

Dimensional drawings

Pressure transmitters for differential pressure, for flanging

Measuring setups for open containers



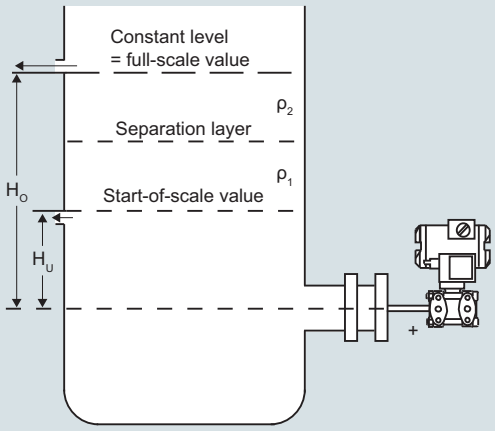
Level measurement

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



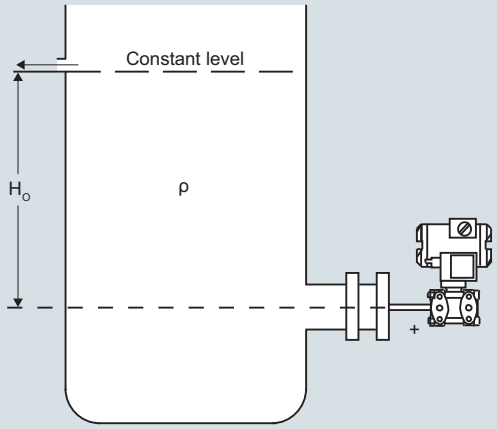
Separation layer measurement

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

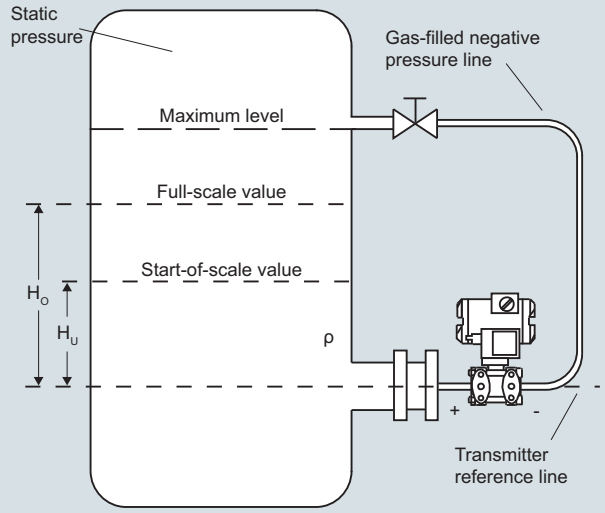
Start-of-scale: $p_{MA} = \rho_{MIN} \cdot g \cdot H_O$

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 for closed containers



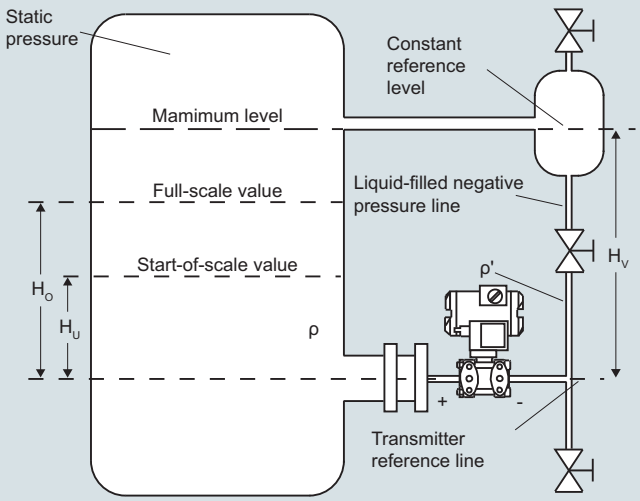
Level measurement, Version 1

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



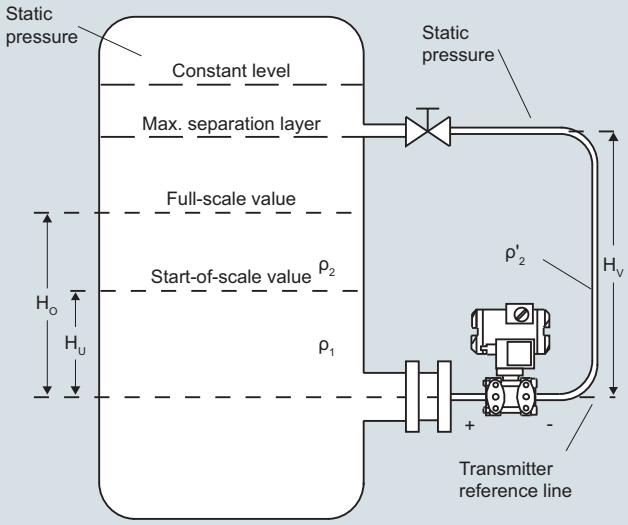
Level measurement, Version 2

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)

1

Questionnaire for hydrostatic level measurement

Order date: _____

Processing date: _____

Ordering code (customer): _____

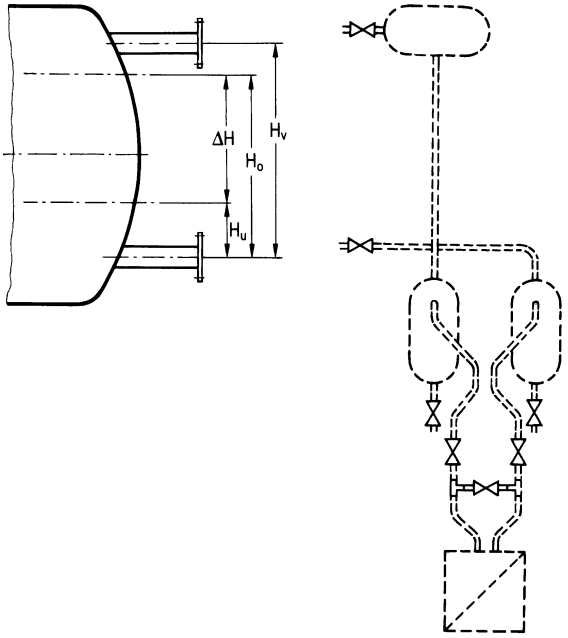
Ordering code (supplier): _____

Customer reference: _____

Measuring point: _____

Position: _____

Dimensions: _____



Pressure: ☐ bar

Temperature: ☐ K ☐ °C

Measuring range: ☐ cm ☐ m
(please mark with cross)

Article No. of transmitter SITRANS P DS III/P300/P310/P410[1)]:

7 M F 4 _ _ _ _ – _ _ _ _ _ _ – _ _ _ _ _ _ –Z

Y01

Article No. of transmitter SITRANS P500[1)]:

7 M F 5 _ _ _ _ – _ _ _ _ _ _ 0

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)		_____ bar
Operating pressure (absolute)	Lowest	_____ bar
	Normal[3)]	_____ bar
	Highest	_____ bar
Temperature of reference column (cold)		_____ K
Distance between measuring points (dimension according to sketch) H_V =		_____ m
Measuring range[4)] = start-of-scale value to full-scale value		
	Start-of-scale value	H_U = _____ m
	Full-scale value	H_O = _____ m
Position of equalizing vessel above bottom measuring point if different from H_V		_____ m
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.

* Customer:_____ Tag. No.: _____
* Plant: _____ Item No.: _____
* Ordering code:_____ Person responsible: _____
* Ordering department: _____ Phone: _____
*** Transmitter Article No. SITRANS P DS III/P300/P310/P410: 7MF ☐☐☐☐ –1 ☐ Y ☐☐ –1 ☐☐☐**
*** Transmitter Article No. SITRANS P500: 7MF5 ☐☐☐ – ☐☐☐☐ 0 –Z V00**

Article No. of diaphragm seal known?

Yes

*** Article No. of remote seal:**
7MF 4 8 ☐☐ – ☐☐☐☐☐ – ☐☐ –Z
Suffixes _____
Suffixes _____

No

*** Or without Article No.: Process connection**
* Standard: _____
* Nominal diameter: _____
* Nominal pressure: _____
* Constructional design:
☐ Sandwich-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!
***) Values must be entered here!**

Checked: Name:
Department:
Date:

Yes

Medium _____
Density of medium: _____ kg/m³
*** 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 1/434 and 1/435 ☐ 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

1

Technical description

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.

Classification according to pressure equipment directive (PED 2014/68/EU):

For gases of fluid group 1 and liquids of fluid group 1; compliance with requirements of article 4, paragraph 3 (sound engineering practice).

Norm IEC 61518/DIN EN 61518

The flange connection between transmitter and valve manifold was modified in the new standard IEC 61518/DIN EN 61518. The only connection thread approved for use in the process flanges of the pressure transmitter is $^{7}/_{16}$-20 UNF.

The valve manifolds for M12 screws, including the accessory sets, have therefore been deleted.

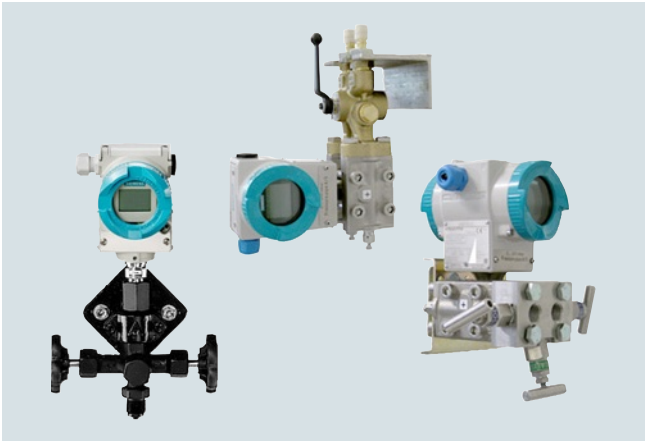
Inspection certificate to EN 10204-3.

If an inspection certificate according to EN 10204-3.1 is required for ordering valve manifolds or shut-off fittings, be aware that one certificate is sufficient for each valve type ordered. This means that you will only be charged for one certificate in the cost calculations.

Minimum/maximum operating temperatures
The maximum operating temperatures are given for each value or valve manifold.
The minimum operating temperatures depend on the material used for the valves or valve manifold.
They are as follows:

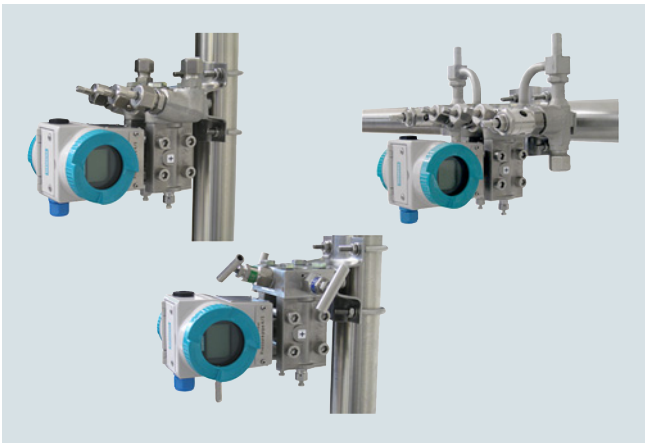
Material	Minimum operating temperature
Brass	-10 °C (-14 °F) according to EN 12516-4
Steel	-10 °C (-14 °F) according to AD200-W10
Stainless steel	-40 °C (-40 °F)

Pressure transmitters with shut-off fittings - mounting examples

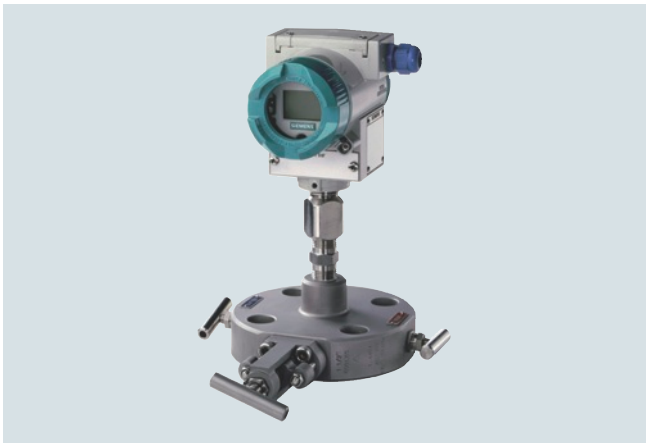


SITRANS P transmitter for gauge pressure with double shut-off valve, SITRANS P pressure transmitter with multiway cock or 3-spindle valve manifold

SITRANS P pressure transmitter for differential pressure, mounted in protective box (available on request)

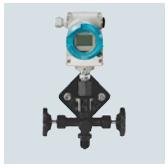
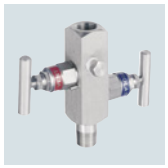
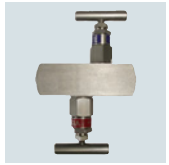
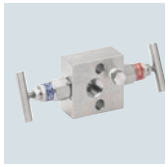
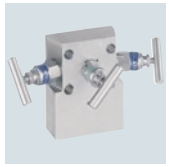


SITRANS P transmitter for differential pressure with 3-way valve manifold, 3-spindle valve manifold or valve manifold combination DN 5/DN 8



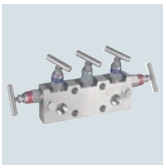
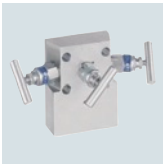
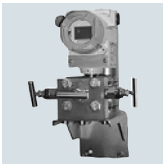
SITRANS P pressure transmitter mounted on valve combination "Monoflange" for direct connection to flanges (available on request)

Selection of available shut-off valves

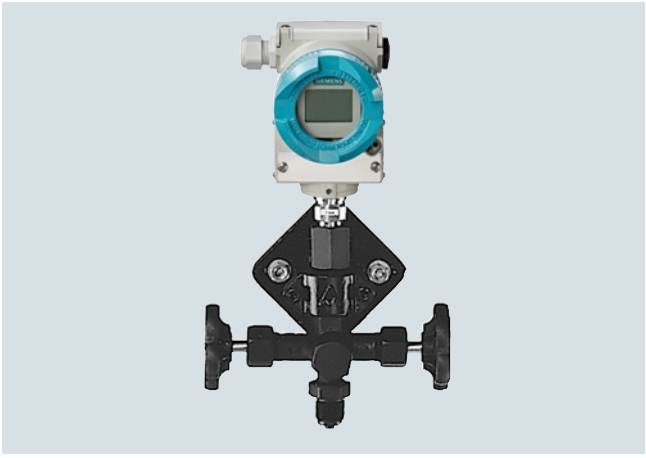
Transmitters	Shut-off valves for general applications	Page		Shut-off valves for special applications	Page	
Relative and absolute pressure transmitters with process connection G½" male thread e.g. • SITRANS P200 7MF1565-... • SITRANS P210 7MF1566-... • SITRANS P220 7MF1567-... • SITRANS P300 7MF802.-...0.-.... • SITRANS P 320/420 7MF030.-..D..-.... 7MF032.-..D..-.... 7MF040.-..D..-.... 7MF042.-..D..-.... • SITRANS P DS III series 7MF403.-...0.-.... and 7MF423.-...0.-.... • SITRANS P410 7MF243.-...0.-.... C41	Shut-off valves/double shut-off valves to DIN 16270, DIN 16271 and DIN 16272	1/443		Double shut-off valve DN 5 for crossover ½-NPT-F to G½ nipple connection 7MF9011-4EA	1/446	
				2-spindle valve manifold DN 5 for installation in protective boxes 7MF9412-1B	1/464	
Gauge and absolute pressure transmitters with process connection ½"-14 NPT female or male thread e.g. • SITRANS P200 7MF1565-... • SITRANS P210 7MF1566-... • SITRANS P220 7MF1567-... • SITRANS P300 7MF802.-...1.-.... • SITRANS P 320/420 7MF030.-..E..-.... 7MF030.-..F..-.... 7MF032.-..E..-.... 7MF032.-..F..-.... 7MF040.-..E..-.... 7MF040.-..F..-.... 7MF042.-..E..-.... 7MF042.-..F..-.... • SITRANS P DS III series 7MF403.-...1.-.... and 7MF423.-...1.-.... • SITRANS P410 7MF243.-...1.-.... C41	Double shut-off valve DN 5 7MF9011-4EA, -4FA, -4GA and -4KA	1/446	 7MF9011-4FA  7MF9011-4KA	Double shut-off valve DN 5 for process connection ½-NPT 7MF9011-4HA	1/446	
Absolute pressure transmitter with process connection to IEC 61518/DIN EN 61518 e.g. • SITRANS P 320/420 7MF033.-.....-.... 7MF043.-.....-.... • SITRANS P DS III series 7MF433.-...	2-spindle valve manifold DN 5 7MF9411-5A.	1/449		2-spindle valve manifold DN 5 for installation in protective boxes 7MF9412-1C.	1/464	

1

Selection aid

Transmitters	Shut-off valves for general applications	Page		Shut-off valves for special applications	Page	
Differential pressure transmitter with process connection to IEC 61518/DIN EN 61518 e.g. • SITRANS P 320/420 7MF034.-.....-.... 7MF044.-.....-.... • SITRANS P DS III series 7MF443.-... and 7MF453.-... • SITRANS P410 7MF443.-... C41; 7MF453.-... C41 • SITRANS P500 7MF54..-...	For 3/5-spindle valve manifold DN 5 7MF9411-5B. and 7MF9411-5C.	1/449	 	3-way valve manifold DN 5, forged version 7MF9410-1..	1/454	
				5-way valve manifold, DN 5, forged version 7MF9410-3..	1/454	
	PN 100 multiway cocks 7MF9004-...	1/452	 	3-way valve manifolds DN 8, forged version 7MF9416-1.. and 7MF9416-2..	1/457	
				valve manifold combination DN 5/DN 8 for vapor measurement 7MF9416-6..	1/460	
				valve manifold combination DN 8 for vapor measurement 7MF9416-4..	1/462	
				3- and 5-spindle valve manifold for DN 5 for installation in protective boxes 7MF9412-1D. and 7MF9412-1E.	1/464	 
				3- and 5-spindle valve manifold for vertical differential pressure lines 7MF9413-1..	1/468	
				Low-pressure multiway cock 7MF9004-4..	1/471	

Overview



Transmitter for pressure with double shut-off valve 7MF9401-...

The shut-off valves for pressure gauges are used to shut off the line of the measured medium when dealing with aggressive and non-aggressive gases, vapors and liquids.

Design

A water trap must be connected upstream of the shut-off valve in the case of temperatures of the medium above 120 °C. The shut-off valves form B have a shaft with which they can be secured on an instrument bracket. An adapter is therefore not required to secure these valves. The vent/test connection can be shut off separately with the double shut-off valves DN 5. This permits checking of the zero on the pressure gauge. In addition, the characteristic of the pressure gauge can be checked using an external pressure source. The valve packing material is PTFE.

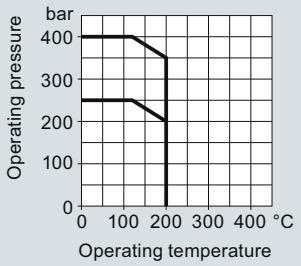
Selection and Ordering data		Article No.
Shut-off valves, form B, DIN 16270		
without test collar, connection shank, without certificate		
Material Valve enclosure	Maximum permissible working pressure	
CW614N (CuZn39Pb3) (mat. No. 2.0402)	250 bar (3626 psi)	**7MF9401-7AA**
P250GH (mat. No. 1.0460)	400 bar (5800 psi)	**7MF9401-7AB**
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	400 bar (5800 psi)	**7MF9401-7AC**
Shut-off valves, form B, DIN 16271		
with test collar, connection shank, without certificate		
Material Valve enclosure	Maximum permissible working pressure	
CW614N (CuZn39Pb3) (mat. No. 2.0402)	250 bar (3626 psi)	**7MF9401-7BA**
P250GH (mat. No. 1.0460)	400 bar (5800 psi)	**7MF9401-7BB**
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	400 bar (5800 psi)	**7MF9401-7BC**

Selection and Ordering data		Article No.
Shut-off valves, form B, DIN 16270		
without test collar, pipe union with ferrule 12 S DIN EN ISO 8434-1, without certificate		
Material Valve enclosure	Maximum permissible working pressure	
P250GH (mat. No. 1.0460)	400 bar (5800 psi)	**7MF9401-8AB**
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	400 bar (5800 psi)	**7MF9401-8AC**
Shut-off valves, form B, DIN 16271		
with test collar, pipe union with ferrule 12 S DIN EN ISO 8434-1, without certificate		
Material Valve enclosure	Maximum permissible working pressure	
P250GH (mat. No. 1.0460)	400 bar (5800 psi)	**7MF9401-8BB**
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	400 bar (5800 psi)	**7MF9401-8BC**
Double shut-off valves, form B, DIN 16272		
with test collar, connection shank, without certificate		
Material Valve enclosure	Maximum permissible working pressure	
CW614N (CuZn39Pb3) (mat. No. 2.0402)	250 bar (3626 psi)	**7MF9401-7DA**
P250GH (mat. No. 1.0460)	400 bar (5800 psi)	**7MF9401-7DB**
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	400 bar (5800 psi)	**7MF9401-7DC**
Double shut-off valves, form B, DIN 16272		
with test collar, pipe union with ferrule 12 S DIN EN ISO 8434-1, without certificate		
Material Valve enclosure	Maximum permissible working pressure	
P250GH (mat. No. 1.0460)	400 bar (5800 psi)	**7MF9401-8DB**
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	400 bar (5800 psi)	**7MF9401-8DC**
Accessories		
Factory certificate according to EN 10204–2.2		**7MF9000-8AB**
Material inspection certificate EN 10204-3.1		**7MF9000-8AD**

Instrument bracket, see page 1/448.

Shut-off valves to DIN 16270, DIN 16271 and DIN 16272

Characteristic curves

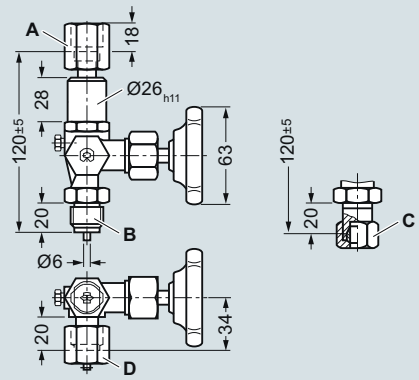


Steel or stainless steel version
400 bar (5800 psi) at 120 °C (248 °F)
350 bar (5076 psi) at 200 °C (392 °F)

Brass version
250 bar (3626 psi) at 120 °C (248 °F)
200 bar (2901 psi) at 200 °C (392 °F)

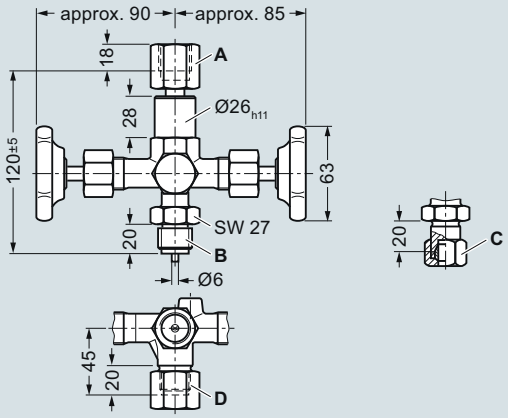
Permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



A Connection on device side: to DIN 16284, G½, SW 27
B Connection on measurement side: connection shank to DIN EN 837-1, G½
C Connection on measurement side: pipe union with ferrule 12 mm diameter, S series, to DIN EN ISO 8434-1
D Connection on test collar (with sealing cap): thread M20 x 1,5

Shut-off valve, form B, dimension drawing, dimensions in mm



A Connection on device side: to DIN 16284, G½, SW 27
B Connection on measurement side: connection shank to DIN EN 837-1, G½
C Connection on measurement side: pipe union with ferrule 12 mm diameter, S series, to DIN EN ISO 8434-1
D Connection on test collar (with sealing cap): thread M20 x 1,5

Double shut-off valve, form B, dimension drawing, dimensions in mm

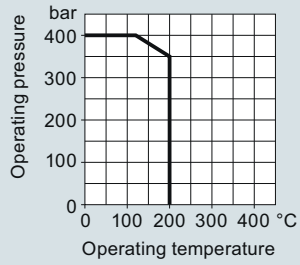
Overview

P300 pressure transmitter with shut-off valve and angle adapter

The angle adapter enables pressure transmitters with top displays to be read from the front.

Selection and Ordering data	Article No.
Angle adapters	**7MF9401-7WA**
Material: X 12 CrNiMoTi 17 12 2 (mat. No. 1.45714/316Ti), max. permissible operating pressure 400 bar (5800 psi)	
Accessories	
Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate EN 10204-3.1	**7MF9000-8AD**

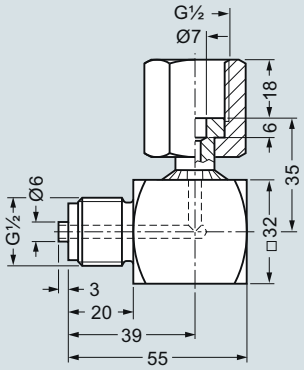
Characteristic curves



Stainless steel version
400 bar (5800 psi) at 120 °C (248 °F)
350 bar (5076 psi) at 200 °C (392 °F)

Permissible operating overpressure as a function of the permissible operating temperature

Dimensional drawings



Angle adapter, dimensions in mm

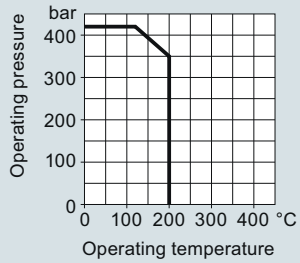
Overview

The double shut-off valves DN 5 are suitable for pressure gauges and pressure transmitters and available in 5 versions:

- Sleeve-nipple
- Sleeve-sleeve
- Sleeve-collar
- Collar-collar
- Collar-sleeve

The valve packing material is PTFE.

Characteristic curves

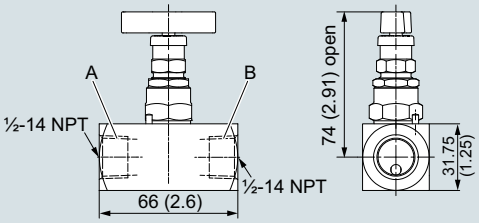


420 bar (6092 psi) at 120 °C (248 °F)
350 bar (5076 psi) at 200 °C (392 °F)

Permissible operating pressure as a function of the permissible operating temperature

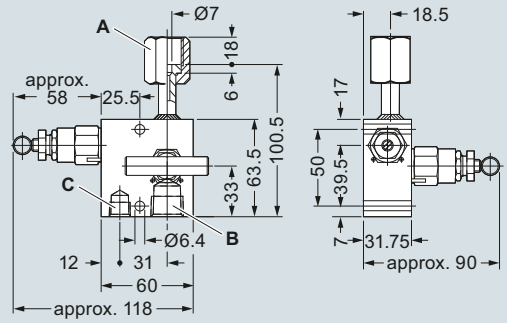
Selection and Ordering data	Article No.
Shut-off valves DN 5	
Material: X 6 CrNiMoTi 17 13 2 (W.-Nr. 1.4404/316L), max. permissible operating overpressure 420 bar (6092 psi)	
• Sleeve-sleeve	**7MF9011-3HA**
Double shut-off valves DN 5	
Material: X 6 CrNiMoTi 17 13 2 (mat. No. 1.4404/316L), max. permissible working pressure 420 bar (6092 psi);	
• Sleeve-nipple connection	**7MF9011-4EA**
• Sleeve-sleeve	**7MF9011-4HA**
• Sleeve-collar	**7MF9011-4FA**
• Collar-collar	**7MF9011-4GA**
• Collar-sleeve	**7MF9011-4KA**
Accessories	
Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate EN 10204-3.1	**7MF9000-8AD**
Further designs	Order code
Add "**-Z**" to Article No. and specify Order code.	
Oil- and grease-free cleaning for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F)	**S12**
NACE MR-0175-certified	**D07**
incl. inspection certificate 3.1 to EN 10204	

Dimensional drawings



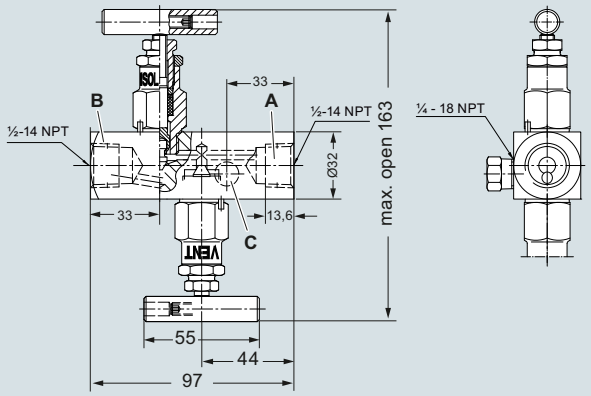
A Connection on device side: ½-14 NPT
B Connection on measurement side: ½-14 NPT

Shut-off valve DN 5 (sleeve-sleeve) 7MF9011-3HA, dimensions in mm (inch)



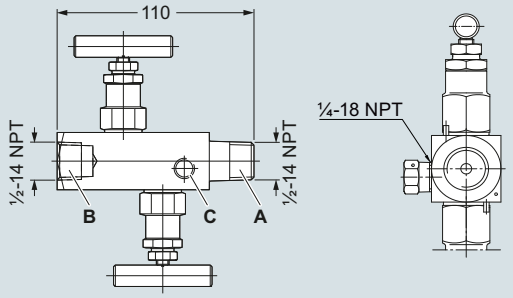
A Connection on device side: nipple to DIN 16284, G½, SW 27
B Connection on measurement side: ½-14 NPT
C Vent and test connection: ¼-18 NPT

Double shut-off valve DN 5 (sleeve-nipple) 7MF9011-4EA, dimensions in mm



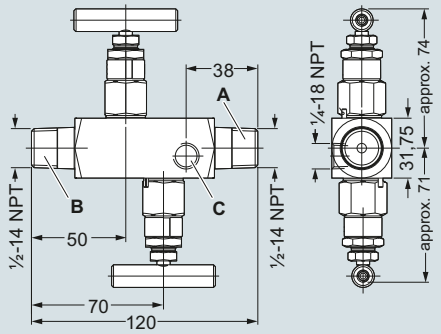
A Connection on device side : ½-14 NPT
B Connection on measurement side: ½-14 NPT
C Vent and test connection: ¼-18 NPT

Double shut-off valve DN 5 (sleeve-sleeve) 7MF9011-4HA, dimensions in mm



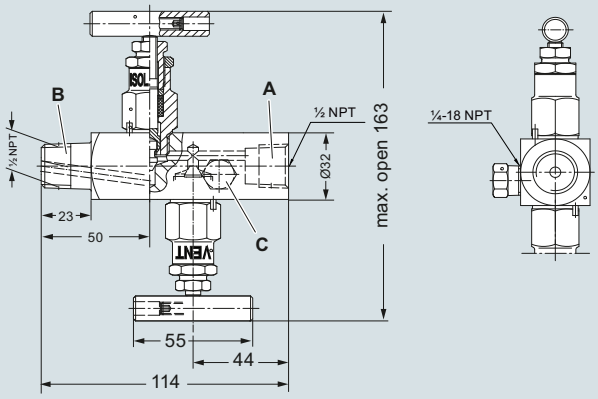
A Connection on device side : ½-14 NPT
B Connection on measurement side: ½-14 NPT
C Vent and test connection: ¼-18 NPT

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



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-sleeve) 7MF9011-4KA, dimensions in mm

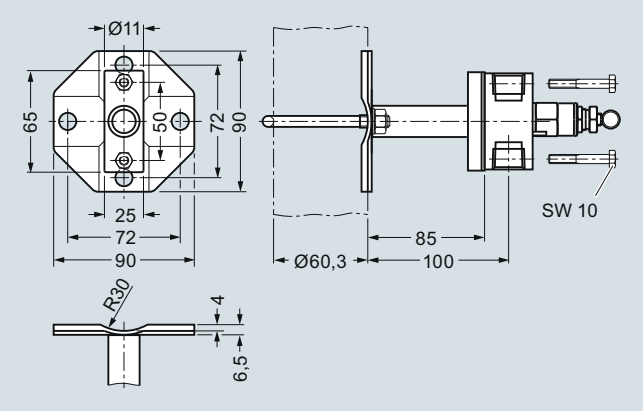
Accessories for shut-off valves/double shut-off valves

Overview

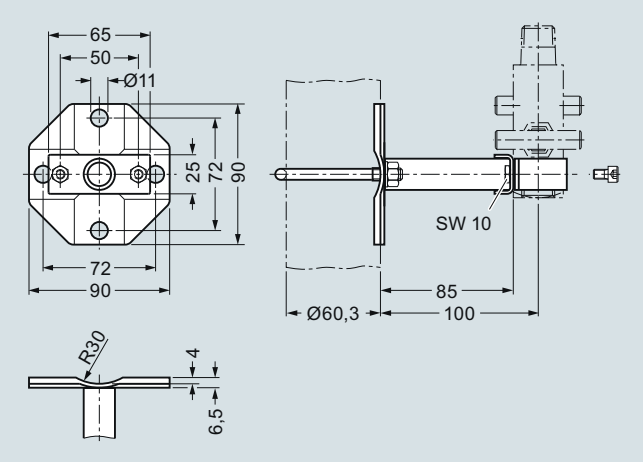
The mounting set is suitable for the double shut-off valves 7MF9011-4.A and for wall, rack and pipe mounting.

Selection and Ordering data	Article No.
Mounting set for shut-off valves	
• 7MF9011-4DA and -4EA made of stainless steel, scope of delivery: 1x mounting bracket, 2x hexagon screws M6x40, 1x mounting clip, 2x washers 8.4 to DIN 125; 2x hexagon nuts 8.4 to DIN EN 24032	**7MF9011-8AB**
• 7MF9011-4FA, -4GA, 4HA, -4KA and -3HA made of stainless steel, scope of delivery: 1x mounting bracket, 2x hexagon screws M6x10, 1x mounting clip, 2x washers 8.4 to DIN 125; 2x hexagon nuts 8.4 to DIN EN 24032	**7MF9011-8AC**

Dimensional drawings



Mounting bracket (7MF9011-8AB) for shut-off valves 7MF9011-4DA and 7MF9011-4EA for wall, rack or pipe mounting, dimensions in mm



Mounting bracket (7MF9011-8AC) for shut-off valves 7MF9011-4FA and 7MF9011-4GA for wall, rack or pipe mounting, dimensions in mm

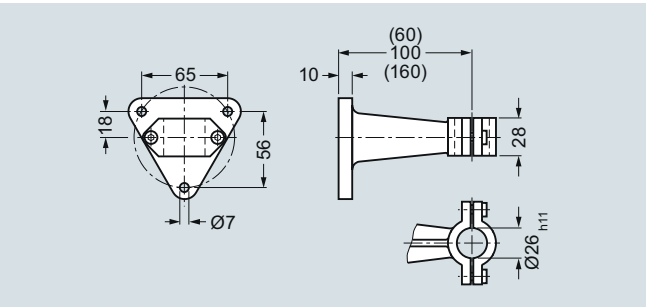
Overview

The instrument brackets are needed to mount the following units:

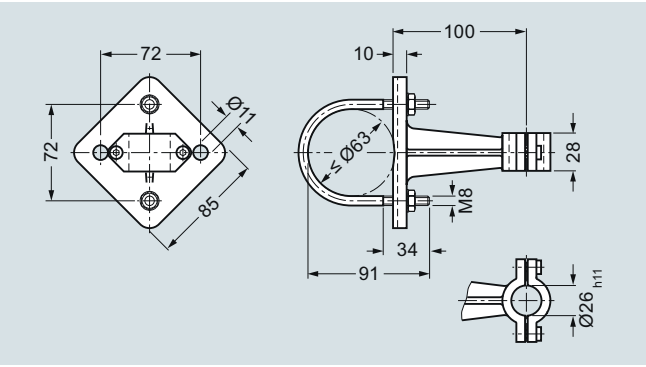
- Pressure gauges with threaded connection at the bottom
- Shut-off valves to DIN 16270, DIN 16271 and DIN 16272 (7MF9401-7.. and 7MF9401-8..)

Selection and Ordering data	Article No.
Instrument bracket, form H, DIN 16281 (e.g. for gauge) made of aluminium alloy, painted black, **for wall mounting**, screw-type bracket cover	
• Projection length 60 mm	**M56340-A0046**
• Projection length 100 mm	**M56340-A0047**
Instrument bracket, form A, DIN 16281 (e.g. for transmitter) made of annealed cast iron, galvanized and primed **for mounting on a wall** or rack or or on a sectional rail (horizontal/vertical); Screw-type bracket cover	**M56340-A0053**
Instrument bracket, form A, DIN 16281 (e.g. for transmitter) made of annealed cast iron, galvanized and primed with pipe clamp for **wall and pipe mounting** (horizotal/vertical) Screw-type bracket cover	**M56340-A0079**

Dimensional drawings



Instrument bracket form H, for wall mounting, M56340-A0046/-A0047, dimensions in mm



Instrument bracket form A, wall or pipe mounting, M56340-A0053/-A0079, 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 IEC 61518/DIN 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.
Enclosure	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	Article No.
Valve manifolds DN 5 ↗	**7MF9411-■■A**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
for liquids and gases, for flanging to pressure transmitters for absolute and differential pressure, max. working pressure 420 bar (order accessory set with Order code), without certificate	
• 2-spindle valve manifold	**5A**
• 3-spindle valve manifold	**5B**
• 5-spindle valve manifold	**5C**
Accessories	
Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate EN 10204-3.1	**7MF9000-8AD**

Selection and Ordering data	Order code	Article No.
Further designs[1]		
Please add "**-Z**" to Article 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 manifolds 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**
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)	**K25**	**7MF9411-7BC**

2-, 3- and 5-spindle valve manifolds DN 5

Selection and Ordering data	Order code	Article No.
Further designs[1]		
Please add "**-Z**" to Article No. and specify Order code.		
for valve manifolds 7MF9411-5B. and -5C.		
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) and fastening screws for mounting on valve manifold	**M12**	**7MF9006-6GA**
• for valve manifold, made of **stainless steel 316L**		
- **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 M21, 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**	
NACE MR-0175-certified incl. inspection certificate 3.1 to EN 10204	**D07**	

1) When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Article No.
2) Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)!

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

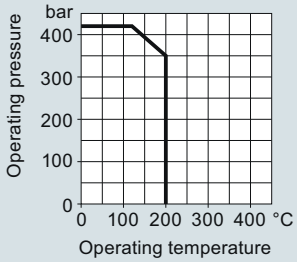
Made of electrogalvanized sheet-steel

- 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

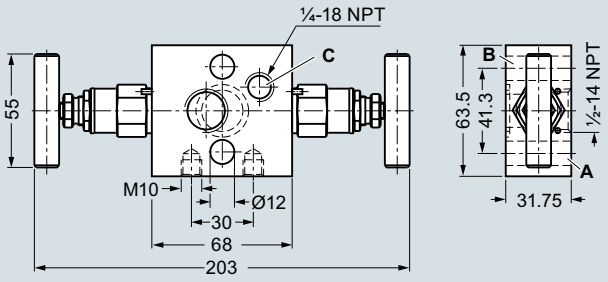
- S12: For 2-way valve manifold
- S13: For 3-way valve manifold
- S14: For 5-way valve manifold

Characteristic curves



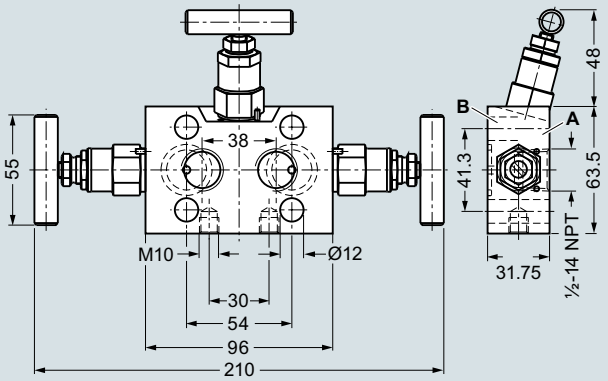
Valve manifolds PN 5 (7MF9411-5..), permissible working pressure as a function of the permissible working temperature

Dimensional drawings



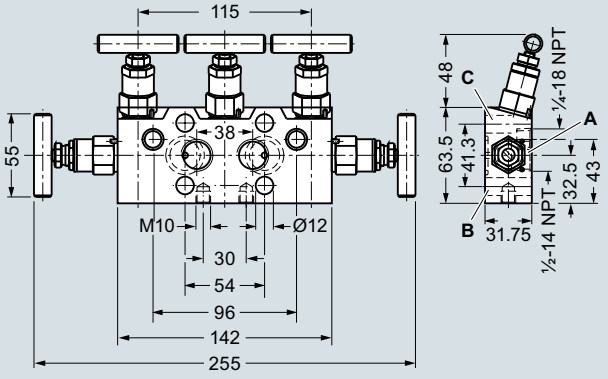
A Process connection: ½-14 NPT
B Transmitter connection: Flange connection to IEC 61518, form B
C Vent / test connection: ¼-18 NPT
Valve design: external spindle thread

2-spindle valve manifold DN 5 (7MF9411-5A.), dimensions in mm



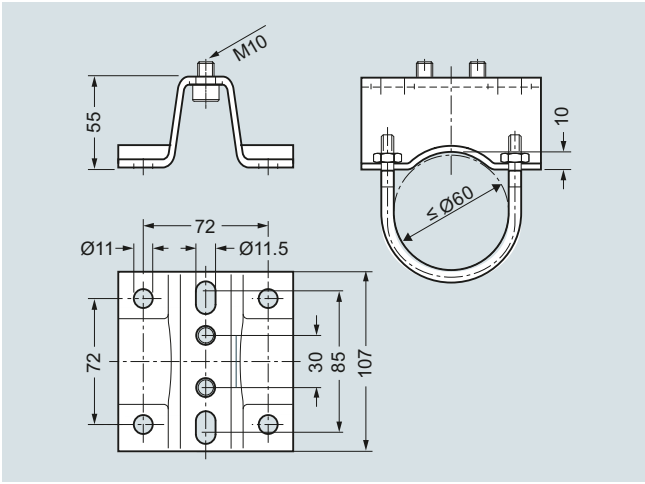
A Process connection: ½-14 NPT
B Transmitter connection: Flange connection to IEC 61518, form B
Valve design: external spindle thread

3-spindle valve manifold DN 5 (7MF9411-5B.), dimensions in mm



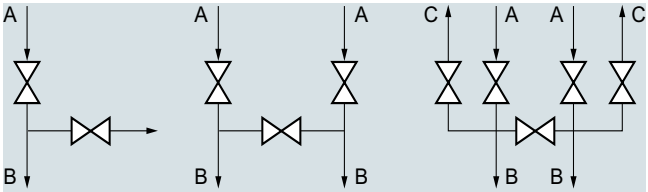
A Process connection: ½-14 NPT
B Transmitter connection: Flange connection to IEC 61518, form B
C Vent / test connection: ¼-18 NPT
Valve design: external spindle thread

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

Multiway cocks PN 100

Overview

Multiway cock PN 100 (1450 psi) (7MF9004-1P.) for differential pressure transmitters

The multiway cock PN 100 (1450 psi) can be flanged to pressure transmitters for differential pressure.

Benefits

- Version available for aggressive liquids, gases and vapors
- Robust design
- Oil-free and grease-free version possible
- One-hand operation

Application

The PN 100 (1450 psi) multiway cock is available in versions for aggressive and non-aggressive liquids, gases and vapors.

Design

The multiway cock can be flanged with four screws to pressure transmitters for differential pressure.

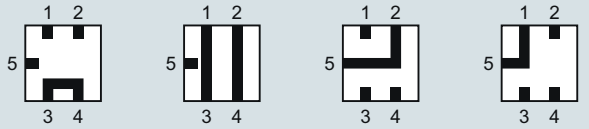
The PN 100 (1450 psi) has 2 process connections and one blow-out connection. A steel version of the multiway cock is available for non-aggressive media, and a stainless steel version for aggressive media. The enclosure is forged in one piece. The switching lever is removable.

Sealing can be improved during operation.

Note: An accessory set is always required for flanging of the multiway cock to a differential pressure transmitter.

Function

- Shutting off the differential pressure lines
- Blowing out the differential pressure lines
- Testing the pressure transmitter zero



Cock positions; the symbols are printed on the cock

Technical specifications

Multiway cocks PN 100		
Medium	**Water, non-aggressive liquids and gases**	**Aggressive liquids, gases and vapors**
Material	P250GH, mat. No.: 1.0460	X 6 CrNiMoTi 17 12 2, mat. No. 1.4571/316Ti
Connections	Steel, for pipe Ø 12 mm, L series	Stainless steel, for pipe Ø 12 mm, L series
• Process connection • Connection for blowing out	2 bulkhead glands Pipe union with ferrule	
Max. permissible working temperature	200 °C (392 °F)	
Max. permissible working pressure	100 bar (1450 psi) (up to max. 60 °C (140 °F))	
Weight	2.5 kg	

Selection and Ordering data	Article No.
Multiway cock PN 100 (1450 psi) ↗	**7MF9004-■■A**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
for flanging to pressure transmitters, weight 2.5 kg (without accessory set), without certificate	
For water and non-aggressive gases and vapors	**1P**
For aggressive liquids, gases and vapors	**1Q**
Accessories	
Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate EN 10204-3.1	**7MF9000-8AD**

Selection and Ordering data	Order code	Article No.
Further designs[1] Please add "**-Z**" to Article No. and specify Order code.		
Accessory set to EN (required for flanging, weight 0.2 kg) 4x screws $^{7}/_{16}$-20 UNF x 1 inch to ASME B18.2.1; chromized steel 2x gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)	**L31**	**7MF9004-5CC**
Accessory set to DIN (required for flanging, weight 0.2 kg) 4x screws M10x25 to DIN EN 24017; chromized steel, 4x washers Ø 10.5 mm to DIN 125; 2x gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)		
• Standard design • Version for oxygen (together with Order code S11	**L11** **L15**	**7MF9004-6AD** **7MF9004-6AE**
Multiway cock in oil-free and grease-free design Oil- and grease-free cleaning for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F), BAM-tested lubricant, gasket suitable for oxygen measurement (only with Article No. 7MF9004–1Q.Z)	**S11**	
Mounting bracket Required **for wall mounting** or for securing on rack (72 mm grid), made of electrogalvanized sheet-steel, weight 0.85 kg	**M13**	**7MF9004-6AA**
NACE MR-0175-certified incl. inspection certificate 3.1 to EN 10204 (only available for version 7MF9004-1QA)	**D07**	

[1] When ordering accessory set or mounting together with the multiway cock, please use Order code; otherwise use Article No.

Accessories

Accessory set for multiway cock PN 100

- L31: 4 screws $^{7}/_{16}$-20 UNF x 1 inch, 2 flat gaskets
- L11: 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets
- L15 (suitable for oxygen): 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)

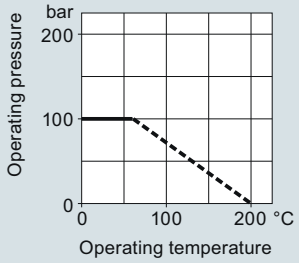
Multiway cock in oil-free and grease-free design

- S11 (only for aggressive liquids, gases and vapors (7MF9004-1Q.)): Max. PN 63 (914 psi) (instead of PN 100 (1450 psi)), BAM-tested lubricant, gasket suitable for oxygen

Mounting brackets

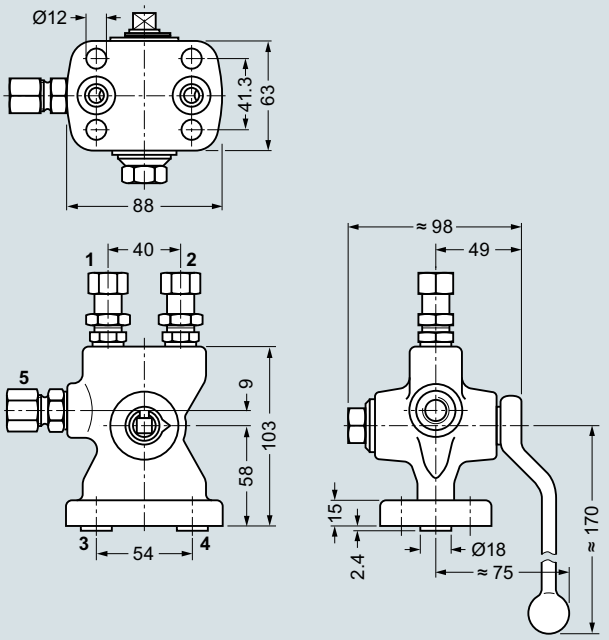
- M13: Required for wall mounting or for securing on rack (72 mm grid); made of electrogalvanized sheet-steel

Characteristic curves



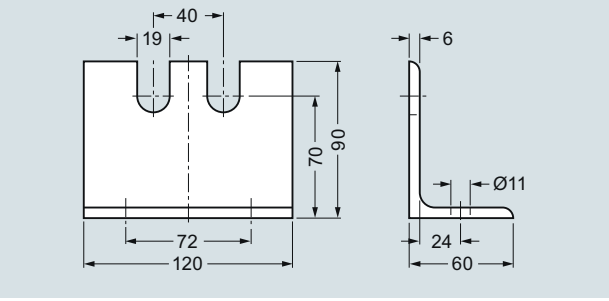
Multiway cock PN 100 (1450 psi), permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



1 and 2 Process connections
3 and 4 Transmitter connections (IEC 61518, form A)
5 Connections for blowing out

Multiway cock 7MF9004-1P. for flanging to pressure transmitters for differential pressure, dimensions in mm



Mounting bracket 7MF9004-6AA (M13), dimensions in mm

3-way and 5-way valve manifolds DN 5

Overview

The three-spindle and five-spindle valve manifolds DN 5 (7MF9410-1../-3..) are used to shut off the differential pressure lines and to check the transmitter zero.

In addition, the five-way valve manifold permits blowing out of the differential pressure lines.

Benefits

- Available for aggressive and non-aggressive liquids and gases
- Max. working pressure 420 bar (6092 psi), with version for oxygen max. 100 bar (1450 psi)

Application

The 3-way and 5-way valve manifolds are available in versions for aggressive and non-aggressive liquids and gases.

Mounting plates are available for wall mounting, for securing to mounti ng racks or for pipe mounting.

Design

The process connection of the 3-way and 5-way valve manifolds is a pipe union with ferrule.

Both valve manifolds have 2 flange connections for connecting a pressure transmitter.

In addition, the five-way valve manifold has 2 blow-out connections.

Depending on the version the valve manifold has either 3 or 5 valves, each with an internal spindle thread.

Materials used

	For non-aggressive liquids and gases		For aggressive liquids and gases	
Component	**Material**	**Mat. No.**	**Material**	**Mat. No.**
Enclosure	P250GH	1.0460	X 6 CrN-iMoTi17 12 2	1.4571/ 316Ti
Head parts	C 35	1.0501		
Spindles	X 12 CrMoS 17	1.4104		
Cones	X 35 CrMo 17 hardened and tempered	1.4122		
Valve seats	X 6 CrNiMoTi 17 12 2	1.4571/ 316Ti		
Packings	PTFE	-	PTFE	-

Function

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero
- In addition, the five-way valve manifold permits blowing out of the differential pressure lines.

Selection and Ordering data	Article No.
3-way valve manifold DN 5 ↗	**7MF9410-■■A**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
For flanging to pressure transmitters for differential pressure, process connection: Pipe union with ferrule, max. working pressure 420 bar (6092 psi), weight 2.9 kg (order accessory set and mounting plate with Order code), without certificate	
• for non-aggressive liquids and gases	**1E**
• for aggressive liquids and gases	**1F**
5-way valve manifold DN 5	
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
For flanging to pressure transmitters for differential pressure, process connection: Pipe union with ferrule, max. working pressure 420 bar (6092 psi), weight 4.4 kg (order accessory set and mounting plate with Order code), without certificate	
• for non-aggressive liquids and gases	**3E**
• for aggressive liquids and gases	**3F**
Accessories	
Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate EN 10204-3.1	**7MF9000-8AD**

Selection and Ordering data	Order code	Article No.
Further designs[1)]		
Please add "**-Z**" to Article No. and specify Order code.		
Accessory set to EN		
(required for flanging, weight 0.2 kg)		
4x screws $^{7}/_{16}$-20 UNF x $2^{1}/_{8}$ inch to ASME B18.2; chromized steel 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**B31**	**7MF9010-5CC**
4x screws $^{7}/_{16}$-20 UNF x $2^{1}/_{8}$ inch to ASME B18.2; chromized steel 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissble 420 bar (6092 psi), 120 °C (248 °F)	**B34**	**7MF9410-5CA**
Accessory set to DIN[2)]		
(required for flanging, weight 0.2 kg)		
4x screws M10x55 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)		
• Standard design	**B11**	**7MF9010-6AD**
• Version for oxygen	**B15**	**7MF9010-6AE**
4x screws M10x55 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissble 420 bar (6092 psi), 120 °C (248 °F)	**B16**	**7MF9010-6CC**
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**
valve manifold 100 bar		
suitable for oxygen		
for 7MF9410-1F	**S13**	
for 7MF9410-3F	**S14**	
NACE MR-0175-certified	**D07**	
incl. inspection certificate 3.1 to EN 10204 (only available for version 7MF9410-1FA and -3FA)		

1) When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Article No.
2) Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)

Accessories

Accessory set for 3-way and 5-way valve manifold DN 5 for flanging

- B31: 4 screws $^{7}/_{16}$-20 UNF x $2^{1}/_{8}$ inch to ASME B18.2.1, 2 flat gaskets
- B34: 4 screws $^{7}/_{16}$-20 UNF x $2^{1}/_{8}$ inch to ASME B18.2.1, 2 O-rings (FPM 90)
- B11: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 flat gaskets
- B15 (suitable for oxygen): 4 screws M10x55 to DIN EN 24014, 4 washers, 2 flat gaskets
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

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 (6092 psi), 120 °C (248 °F)

Note: M10 screws only permissible up to PN 160 (2320 psi)!

Mounting plate

Made of electrogalvanized sheet-steel

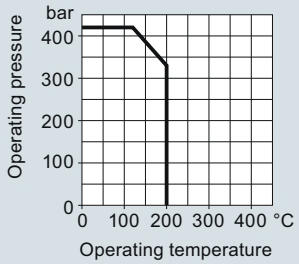
- M11: For wall mounting or for securing on rack (72 mm grid)
  Scope of delivery:
  - 1 mounting plate 7MF9006-6EA with bolts for mounting on valve manifold
- M12: For pipe mounting
  Scope of delivery:
  - 1 mounting plate M11
  - 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm

Valve manifold 100 bar, suitable for oxygen

S12: Only in combination with versions for aggressive liquids and gases

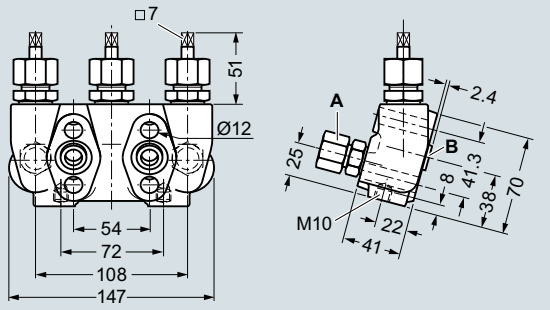
3-way and 5-way valve manifolds DN 5

Characteristic curves



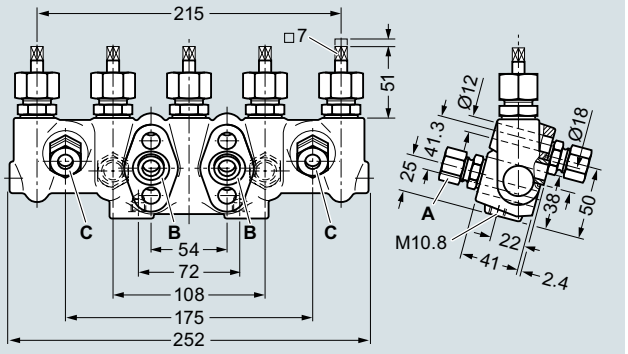
Permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



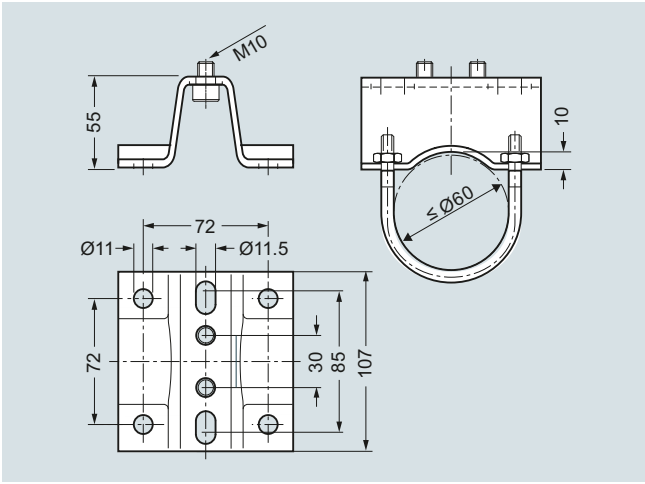
A Process connection (e.g. on primary device):
Pipe union with ferrule, diameter 12 mm, S series to DIN 2353
B Transmitter connection: Flange connection to IEC 61518, form A
Valve design: internal spindle thread

3-way valve manifold DN 5 (7MF9410-1..), dimensions in mm



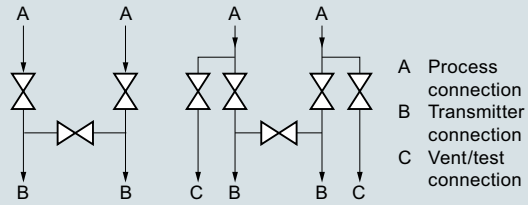
A Process connection (e.g. on primary device):
Pipe union with ferrule, diameter 12 mm, S series to DIN 2353
B Transmitter connection: Flange connection to IEC 61518, form A
C Blow-out connection:
Pipe union with ferrule, diameter 12 mm, S series to DIN 2353
Valve design: internal spindle thread

5-way valve manifold DN 5 (7MF9410-3..), dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

Schematics



3-way and 5-way valve manifolds, connections

Overview

The 3-way valve manifold DN 8 (7MF9416-1../-2..) is for pressure transmitters for differential pressure. It is used to shut off and blow out differential pressure lines and to test the pressure transmitter zero.

In the designs with a test connection, a test device can be connected to test the pressure transmitter characteristic.

Benefits

- For aggressive and non-aggressive liquids and gases
- The maximum working pressure is 420 bar (6092 psi).

Application

The 3-way valve manifold is available in versions for aggressive and non-aggressive liquids and gases.

Mounting plates are available for wall mounting, for securing to mounting racks or for pipe mounting.

Design

For the process connection on the version for non-aggressive media it is possible to choose between a pipe union with ferrule and welding pins.

The version for aggressive media always has a pipe union with ferrule.

Both versions are available optionally with a test connection M20x1.5.

The valves have an internal spindle thread.

Materials used

	For non-aggressive liquids and gases		**For aggressive liquids and gases**	
Component	Material	Mat. No.	Material	Mat. No.
Enclosure	P250GH	1.0460	X 6 CrNiMoTi17 12 2	1.4571/ 316Ti
Head parts	C 35	1.0501		
Spindles	X 12 CrMoS 17	1.4104		
Cones	X 35 CrMo 17 hardened and tempered	1.4122		
Valve seats	X 6 CrNiMoTi 17 12 2	1.4571/316Ti		
Packings	PTFE	-	PTFE	-

Function

The 3-way valve manifold DN 8 performs two functions as standard:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

All versions are also available with a test connection, to which a test device for checking the pressure transmitter characteristic can be connected.

Selection and Ordering data	Article No.
3-way valve manifold DN 8 ↗	**7MF9416-■■A**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
For flanging to pressure transmitters for differential pressure, max. working pressure 420 bar (6092 psi), (order accessory set and mounting plate with Order code), without certificate	
For non-aggressive liquids and gases procedss connection: Pipe union with ferrule Ø 12 mm	
• without test connection	**1B**
• with test connection	**1C**
For non-aggressive liquids and gases procedss connection: Welding pin Ø 14 x 2.5	
• without test connection	**2C**
• with test connection	**2D**
For aggressive liquids and gases process connection: Pipe union with ferrule Ø 12 mm	
• without test connection	**1D**
• with test connection	**1E**
Accessories	
Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate EN 10204-3.1	**7MF9000-8AD**

3-way valve manifold DN 8

Selection and Ordering data	Order code	Article No.
Further designs[1]		
Please add "**-Z**" to Article No. and specify Order code.		
Accessory set to EN (required for flanging, weight 0.2 kg)		
4x screws $^{7}/_{16}$-20 UNF x $2^{1}/_{8}$ inch to ASME B18.2; chromized steel 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)	**B31**	**7MF9010-5CC**
4x screws $^{7}/_{16}$-20 UNF x $2^{1}/_{8}$ inch to ASME B18.2; chromized steel 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)	**B34**	**7MF9410-5CA**
Accessory set to DIN[2] (required for flanging, weight 0.2 kg)		
4x screws M10x55 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)	**B11**	**7MF9010-6AD**
4x screws M10x55 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 420 bar (6092 psi), 120 °C (248 °F)	**B16**	**7MF9010-6CC**
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**
NACE MR-0175-certified incl. inspection certificate 3.1 to EN 10204 (only available for version 7MF9416-1DA and -1EA)	**D07**	

1) When ordering accessory set or mounting together with the valve manifold, please use Order code; otherwise use Article No.
2) Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)!

Accessories

Accessory set for 3-way valve manifold DN 8 for flanging

- B31: 4 screws $^{7}/_{16}$-20 UNF x $2^{1}/_{8}$ inch to ASME B18.2.1, 2 flat gaskets
- B34: 4 screws $^{7}/_{16}$-20 UNF x $2^{1}/_{8}$ inch to ASME B18.2.1, 2 O-rings (FPM 90)
- B11: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 flat gaskets
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

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 (6092 psi), 120 °C (248 °F)

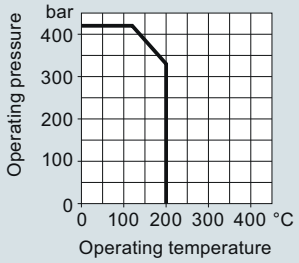
Note: M10 screws only permissible up to PN 160 (2320 psi)!

Mounting plate

Made of electrogalvanized sheet-steel

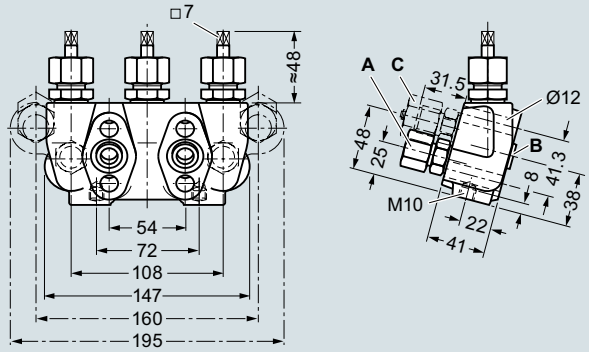
- M11: For wall mounting or for securing on rack (72 mm grid)
  Scope of delivery:
  - 1 mounting plate with bolts for mounting on valve manifold
- M12: For pipe mounting
  Scope of delivery:
  - 1 mounting plate M11
  - 2 pipe brackets with nuts and washers for pipes with max. Ø 60.3 mm

Characteristic curves



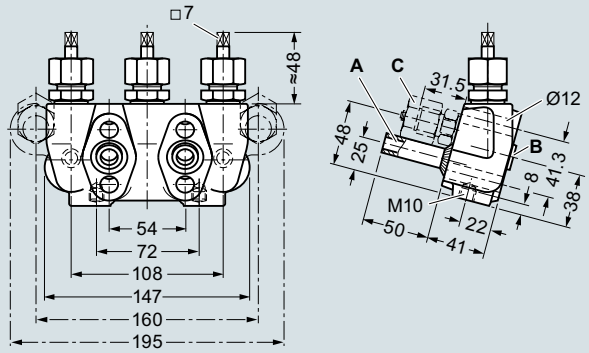
3-way valve manifold DN 8, permissible working pressure as a function of the permissible working temperature

Dimensional drawings



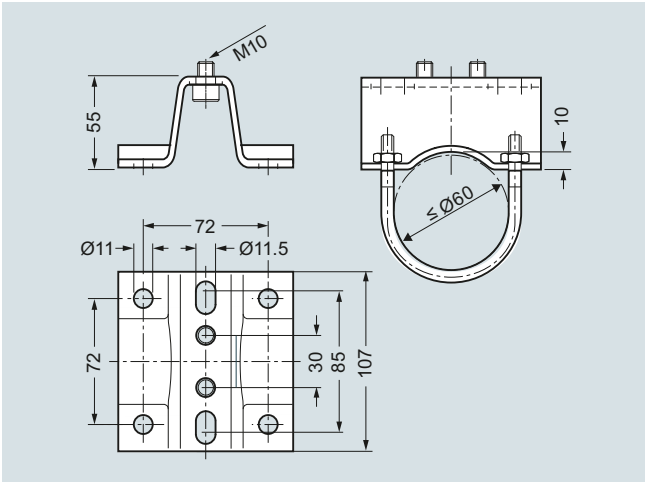
A Process connection (e.g. on primary device):
Pipe union with ferrule, diameter 12 mm, S series to DIN 2353
B Transmitter connection: Flange connection to IEC 61518, form A
C Test connection: M20 x 1.5
Valve design: internal spindle thread

3-way valve manifold DN 8 (7MF9416-1..) with pipe union, dimensions in mm



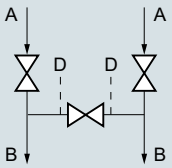
A Process connection (e.g. on primary device):
Welding pin, diameter 14 x 2.5
B Transmitter connection: Flange connection to IEC 61518, form A
C Test connection: M20 x 1.5
Valve design: internal spindle thread

3-way valve manifold DN 8 (7MF9416-2..) with welding pin, dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

Schematics



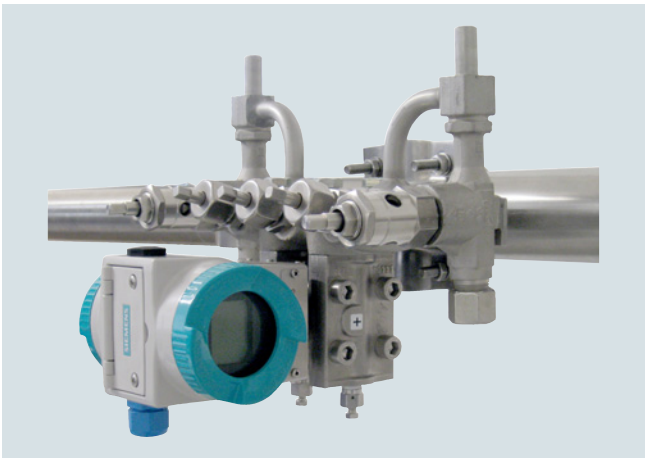
A Process connection
B Transmitter connection
D Vent/test connection

Three-way valve manifold for liquids and gases

3-way valve manifold DN 8, connections

Valve manifold combination DN 5/DN 8

Overview



The valve manifold combination DN 5/DN 8 (7MF9416-6..) is for pressure transmitters for differential pressure.

The combination is used to shut off and blow out differential pressure lines and to test the pressure transmitter zero.

In the designs with a test connection, a test device can be connected to test the pressure transmitter characteristic.

Benefits

- Max. working pressure 420 bar (6092 psi)

Application

The valve manifold combination DN 5/DN 8 is designed for vapors.

Design

The valve manifold combination DN 5/DN 8 has a process connection with welding pins.

The connection for the pressure transmitter is designed as as flange connection, while the blow-out connection is designed as a pipe union with ferrule.

The manifold valves have an internal spindle thread, while the blow-out valves have an external spindle thread.

The optional test connections are M20x1.5.

Materials used

	Valve manifold DN 5		Blow-out valves DN 8	
Component	**Material**	**Mat. No.**	**Material**	**Mat. No.**
Enclosure	P250GH	1.0460	16 Mo 3	1.5415
Head parts	C 35	1.0501	21 CrMo V57	1.7709
Spindles	X 12 CrMoS 17	1.4104	X 20 Cr 13	1.4021
Cones	X 35 CrMo 17	1.4122	X 35 CrMo 17 hardened and tempered	1.4122
Valve seats	X 6 CrNiMoTi	1.4571/316Ti	X 20 Cr 13	1.4021
Packings	PTFE	-	Pure graphite	-
Welding pins	-	-	16 Mo 3	1.5415

Function

- Shutting off the differential pressure lines
- Blowing out the differential pressure lines
- Checking the pressure transmitter zero

As an option it is possible to order a version with a test connection, to which a test device for checking the transmitter characteristic can be connected.

Selection and Ordering data	Article No.
Valve manifold combination DN 5/DN 8 for vapors ↗	**7MF9416-6 A**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
For flanging to pressure transmitters for differential pressure, max. working pressure 420 bar (6092 psi), also available in stainless steel on request (order accessory set with Order code), without certificate	
• without test connection	**C**
• with test connection M20 × 1.5	**D**
Accessories	
Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate EN 10204-3.1	**7MF9000-8AD**

Selection and Ordering data	Order code	Article No.
Further designs[1]		
Please add "**-Z**" to Article No. and specify Order code.		
Accessory set to EN (required for flanging, weight 0.2 kg)		
4x screws $^{7}/_{16}$-20 UNF x $2^{1}/_{8}$ inch to ASME B18.2; chromized steel 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissble 420 bar (6092 psi), 120 °C (248 °F)	**B34**	**7MF9410-5CA**
Accessory set to DIN[2] (required for flanging, weight 0.2 kg)		
4x screws M10x55 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissble 420 bar (6092 psi), 120 °C (248 °F);Flange connection to DIN 19213 only permissible up to PN 160!	**B16**	**7MF9010-6CC**

[1] When ordering accessory set together with the valve manifold combination, please use Order code; otherwise use Article No.

[2] Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)

Accessories

Accessory set for valve manifold combination DN 5/DN 8 for flanging

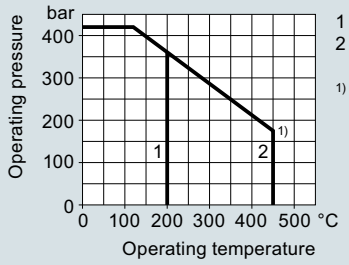
- B34: 4 screws $^{7}/_{16}$-20 UNF x $2^{1}/_{8}$ inch to ASME B18.2.1, 2 O-rings (FPM 90)
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

Washers Ø 10.5 to DIN 125

O-ring to DIN 3771, 20 x 2.65 - S – FPM90, max. 420 bar (6092 psi), 120 °C (248 °F)

Note: M10 screws only permissible up to PN 160 (2321 psi)!

Characteristic curves

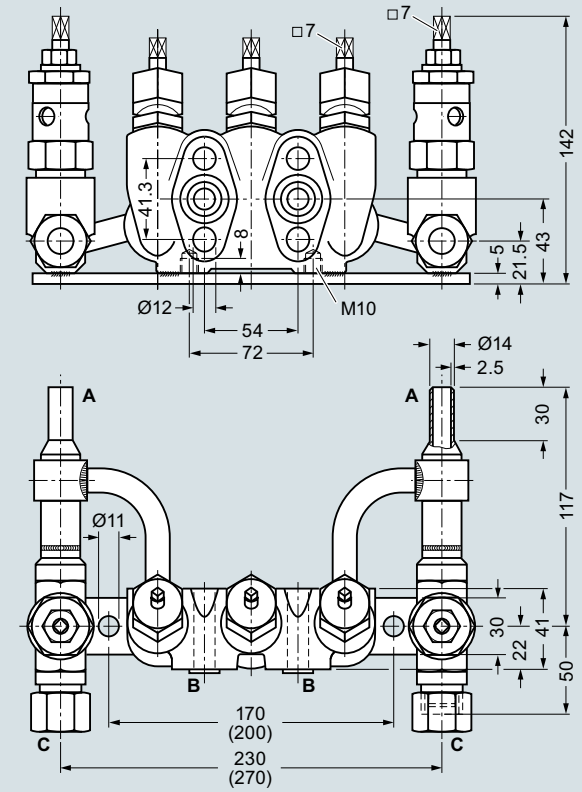


1 Valve manifold
2 Blow-out connection

1) According to DIN 19210 the design can be such that the temperatures for the differential pressure line can be set approx. 100 °C (212 °F) lower than the media temperature.

Permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings

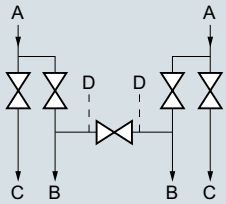


A Process connection (e.g. on primary device): Welding pin
B Transmitter connection: Flange connection to IEC 61518, form A
C Blow-out connection: Pipe union with ferrule, diameter 14 mm, S series to DIN 2353

Valve design:
- Manifold valves: internal spindle thread
- Blow-out valves: external spindle thread

Valve manifold combination DN 5/DN 8 (7MF9416-6C.), dimensions in mm (deviating dimensions for 7MF9416-6D. shown in brackets)

Schematics



A Process connection
B Transmitter connection
C Blow-out connection
D Test connection

Valve manifold combination for vapors

Valve manifold combination DN 5/DN 8, connections

Valve manifold combination DN 8

Overview

The valve manifold combination DN 8 (7MF9416-4..) is for pressure transmitters for differential pressure.

It is used to shut off and blow out the differential pressure lines and to check the pressure transmitter zero.

In the designs with a test connection, a test device can be connected to check the pressure transmitter characteristic.

Benefits

- Max. working pressure 420 bar (6092 psi)

Application

The valve manifold combination DN 8 is designed for vapors.

Design

The valve manifold combination DN 8 has a process connection with welding pins.

The connection for the pressure transmitter is designed as as flange connection, while the blow-out connection is designed as a pipe union with ferrule.

The manifold valves have an internal spindle thread, while the blow-out valves have an external spindle thread.

The optional test connection is M20x1.5.

The valve manifold combination DN 8 is supplied with a mounting plate.

Materials used

	Valve manifold		Blow-out valves	
Component	**Material**	**Mat. No.**	**Material**	**Mat. No.**
Enclosure	P250GH	1.0460	16 Mo 3	1.5415
Head parts	C 35	1.0501	21 CrMo V57	1.7709
Spindles	X 12 CrMoS 17	1.4104	X 20 Cr 13	1.4021
Cones	X 35 CrMo 17	1.4122	X 35 CrMo 17 hardened and tempered	1.4122
Valve seats	X 6 CrNiMoTi	1.4571/316Ti	X 20 Cr 13	1.4021
Packings	PTFE	-	Pure graphite	-
Welding pins	-	-	16 Mo 3	1.5415

Function

- Shutting off the differential pressure lines
- Blowing out the differential pressure lines
- Checking the pressure transmitter zero

As an option it is possible to order a version with a test connection, to which a test device for checking the pressure transmitter characteristic can be connected.

Selection and Ordering data	Article No.
Valve manifold combination DN 8 for vapors ↗	**7MF9416-■■A**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
for flanging to pressure transmitters for differential pressure, with mounting plate, max. working pressure 420 bar (6092 psi), also available in stainless steel on request (order accessory set with Order code), without certificate	
• without test connection	**4C**
• with test connection M20 × 1.5	**4D**
Accessories	
Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate EN 10204-3.1	**7MF9000-8AD**

Selection and Ordering data	Order code	Article No.
Further designs[1]		
Please add "**-Z**" to Article No. and specify Order code.		
Accessory set to EN (required for flanging, weight 0.2 kg)		
4x screws $^{7}/_{16}$-20 UNF x $2^{1}/_{8}$ inch to ASME B18.2; chromized steel 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissble 420 bar (6092 psi), 120 °C (248 °F)	**B34**	**7MF9410-5CA**
Accessory set to DIN[2] (required for flanging, weight 0.2 kg)		
4x screws M10x55 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissble 420 bar (6092 psi), 120 °C (248 °F) Flange connection to DIN 19 213 only permissible up to PN 160!	**B16**	**7MF9010-6CC**

1) When ordering accessory set together with the valve manifold combination, please use Order code; otherwise use Article No.
2) Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)

Accessories

Accessory set for valve manifold combination DN 8 for flanging

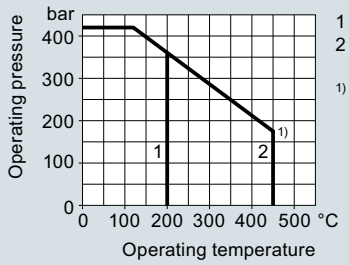
- B34: 4 screws $^{7}/_{16}$-20 UNF x $2^{1}/_{8}$ inch to ASME B 18.2.1, 2 O-rings (FPM 90)
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

Washers Ø 10.5 to DIN 125

O-ring to DIN 3771, 20 x 2.65 – S – FPM90, max. 420 bar (6092 psi), 120 °C (248 °F)

Note: M10 screws only permissible up to PN 160 (2321 psi)!

Characteristic curves

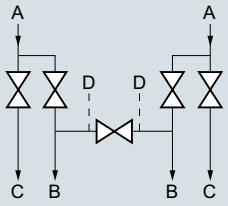


1 Valve manifold
2 Blow-out connection

1) According to DIN 19210 the design can be such that the temperatures for the differential pressure line can be set approx. 100 °C (212 °F) lower than the media temperature.

Permissible operating pressure as a function of the permissible operating temperature

Schematics

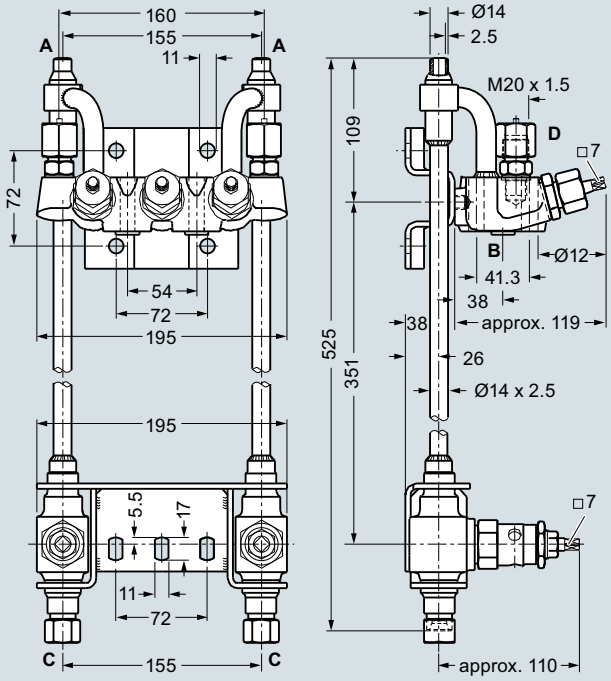


A Process connection
B Transmitter connection
C Blow-out connection
D Test connection

Valve manifold combination for vapors

Valve manifold combination DN 8, connections

Dimensional drawings

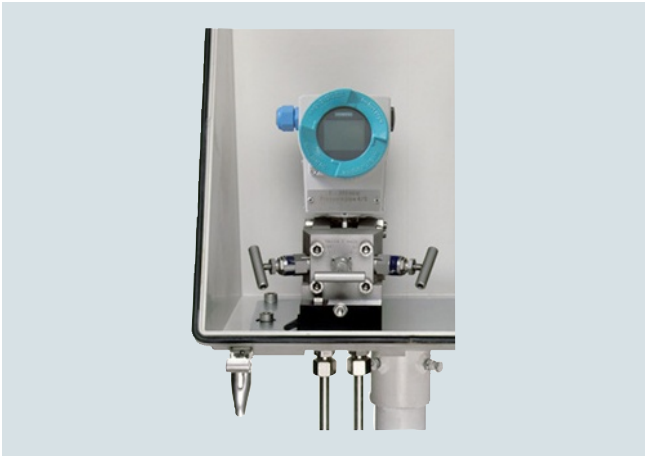


A Process connection (e.g. on primary device): Welding pin
B Transmitter connection: Flange connection to IEC 61518, form A
C Blow-out connection:
Pipe union with ferrule, diameter 14 mm, S series to DIN 2353
D Test connection (only with Article No. 7MF9416-4D.): M20 x 1.5
Valve design:
- Manifold valves: internal spindle thread
- Blow-out valves: external spindle thread

Valve manifold combination DN 8 (7MF9416-4..), dimensions in mm

2-, 3- and 5-spindle valve manifolds for protective box

Overview



The 2-spindle, 3-spindle and 5-spindle valve manifolds (7MF9412-1..) are used to shut off the differential pressure lines and to check the transmitter zero point.

The 2-spindle and the 5-spindle valve manifolds also enable venting on the transmitter side and checking of the pressure transmitter characteristic.

These valve manifolds are designed for installation in protective boxes. However, using a mounting bracket, they can also be used for wall, frame or tube mounting.

SITRANS P DS III and SITRANS P500 transmitters can be operated and read from the front if these valve manifolds are used..

Application

The valve manifolds DN 5 are designed for liquids and vapors and for installing in protective boxes.

Each is available in a version for oxygen on request

Design

All versions of the spindle manifolds have a process connection ½-14 NPT.

The connection for the pressure transmitter is always designed as a flange connection to IEC 61518/DIN EN 61518, Form A.

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

Components	Material	Mat. No.
Enclosure	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	-

Functions

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	Article No.
Valve manifolds DN 5 for mounting in protective boxes ↗	**7MF9412 - ■■ A**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
for liquids and gases for flanging to pressure transmitters for absolute and differential pressure Material: stainless steel, mat. No: 1.4404/316L max. working pressure 420 bar (6092 psi) (order accessory set with Order code), without certificate	
• 2-spindle valve manifold with rotatng sleeve G½	**1 B**
• 2-spindle valve manifold with flange connection	**1 C**
• 3-spindle valve manifold	**1 D**
• 5-spindle valve manifold	**1 E**
Accessories	
Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate EN 10204-3.1	**7MF9000-8AD**

Selection and Ordering data	Order code	Article No.
Further designs[1]		
Please add "**-Z**" to Article No. and specify Order code.		
Accessory set to EN (connection between valve manifold and pressure transmitter)		
for valve manifold 7MF9412–1C.		
2x screws $^{7}/_{16}$-20 UNF x 2 inch to ASME B18.2.1; chromized steel 1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissble 420 bar (6092 psi), 120 °C (248 °F)	**F32**	**7MF9412-6CA**
2x screws $^{7}/_{16}$-20 UNF x 2 inch to ASME B18.2.1; chromized steel 1x gasket made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)[2]	**F35**	**7MF9412-6DA**
for valve manifold 7MF9412–1D and -1E.		
4x screws $^{7}/_{16}$-20 UNF x 2 inch to ASME B18.2.1; chromized steel 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissble 420 bar (6092 psi), 120 °C (248 °F)[2]	**F34**	**7MF9412-6GA**
4x screws $^{7}/_{16}$-20 UNF x 2 inch to ASME B18.2.1; chromized steel 2x flat gaskets made of PTFE, max. permissible 420 bar (6092 psi), 80 °C (176 °F)[2]	**F36**	**7MF9412-6HA**

Selection and Ordering data	Order code	Article No.
Further designs[1]		
Please add "**-Z**" to Article No. and specify Order code.		
Accessory set to DIN		
(connection between valve manifold and pressure transmitter)		
For valve manifold 7MF9412–1C.		
2x screws M10x50 to DIN EN 24014; 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]	**F12**	**7MF9412-6AA**
2x screws M10x50 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)[2]	**F15**	**7MF9412-6BA**
For valve manifold 7MF9412–1D and -1E.		
4x screws M10x50 to DIN EN 24014; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x O-rings to DIN 3771, 20 x 2.65 - S - FPM90, max. permissble 420 bar (6092 psi), 120 °C (248 °F)[2]	**F14**	**7MF9412-6EA**
4x screws M10x50 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)[2]	**F16**	**7MF9412-6FA**
Mounting bracket		
required for wall mounting or for securing to mounting rack, with bolts for mounting on valve manifold		
• for valve manifolds 7MF9412-1B. and -1C.	**M14**	**7MF9006-6LA**
• for valve manifold 7MF9412-1D.	**M17**	**7MF9006-6NA**
• for valve manifold 7MF9412-1E.	**M18**	**7MF9006-6PA**
Mounting clip		
2 off, to secure mounting bracket to pipe	**M16**	**7MF9006-6KA**
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 valve manifolds 7MF9412-1B. and -1C.	**S12**	
• for valve manifold 7MF9412-1D.	**S13**	
• for valve manifold 7MF9412-1E.	**S14**	
NACE MR-0175-certified	**D07**	
incl. inspection certificate 3.1 to EN 10204		

1) When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Article No.
2) Flange connections with M10 screws only permissible up to PN 160 (2321 psi)!

Accessories

Accessory set for 2-, 3- and 5-spindle valve manifolds (Connection between valve manifold and transmitter)

2-spindle valve manifold DN 5 with flange connection

- F32: 2 screws 7/16 20 UNF x 2 inch to ASME B 18.2.1, 1 O Ring (FPM90)
- F35: 2 screws 7/16 20 UNF x 2 inch to ASME B 18.2.1, 1 flat-gasket
- F12: 2 screws M10x50 to DIN EN 24014, 2 washers, 1 O-ring (FPM90)
- F15: 2 screws M10x50 to DIN EN 24014, 2 washers, 1 flat gasket

3-spindle and 5-way valve manifold DN 5

- F34: 4 screws 7/16 20 UNF x 2 inch toASME B 18.2.1, 2 O-rings (FPM90)
- F36: 4 screws 7/16 20 UNF x 2 inch toASME B 18.2.1, 2 flat-gaskets
- F14: 4 screws M10x50 to DIN EN 24014, 4 washers, 2 O-rings (FPM90)
- F16: 4 screws M10x50 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)

O-ring to DIN 3771, 20 x 2.65 - S - FPM90; max.420 bar (6092 psi), 120 °C (248 °F)

Note:
Flange connections with M10 screws only permissible up to PN 160 (2321 psi)!

Mounting bracket for wall mounting or for securing to mounting rack

With bolds for mounting on valve manifold

- M14: For 2-spindle valve manifold DN 5
- M17: For 3-spindle valve manifold DN 5
- M18: For 5-spindle valve manifold DN 5

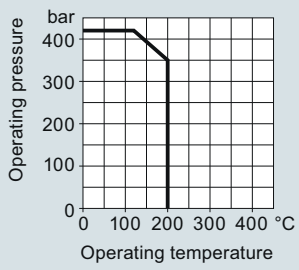
Mounting clips (2 off)

- M16: For securing the mounting brackets M14, M17 and M18 to pipe

Valve manifold 100 bar, suitable for oxygen

- S12: For 2-spindle valve manifold DN 5
- S13: For 3-spindle valve manifold DN 5
- S14: For 5-spindle valve manifold DN 5

Characteristic curves

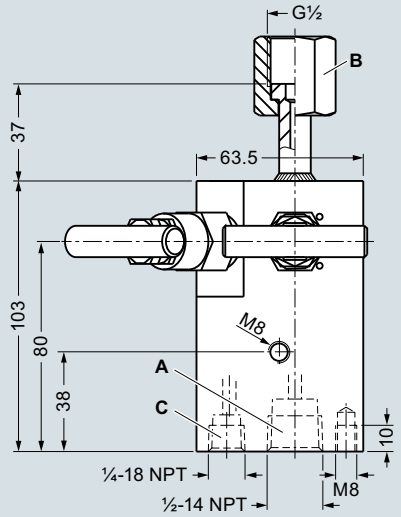


420 bar (6092 psi) at 120 °C (248 °F)
350 bar (5076 psi) at 200 °C (392 °F)

Permissible operating pressure as a function of the permissible operating temperature

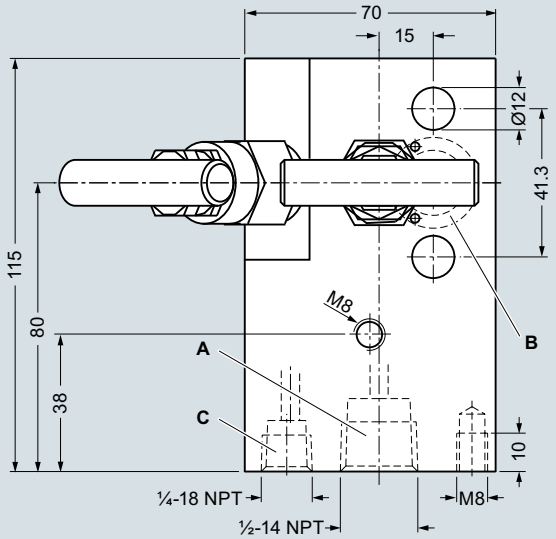
2-, 3- and 5-spindle valve manifolds for protective box

Dimensional drawings



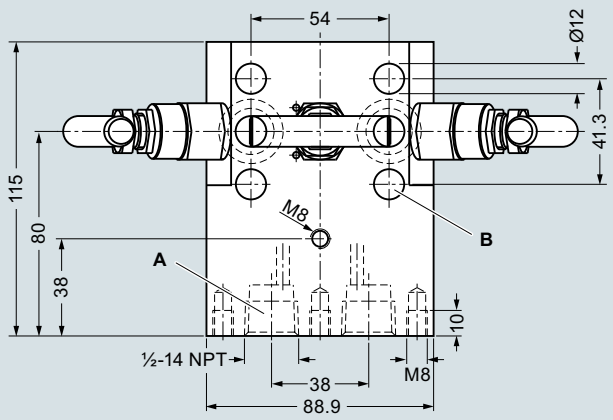
A Process connection: ½-14 NPT
B Transmitter connection: Nipple to DIN 16284, G½, SW 27
C Vent / test connection: ¼-18 NPT

2-spindle valve manifold DN 5 (7MF9412-1B..) with rotating sleeve, dimensions in mm



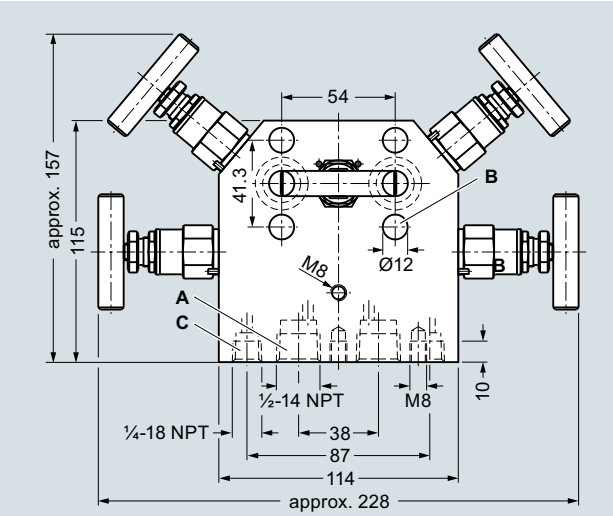
A Process connection: ½-14 NPT
B Transmitter connection: Flange connection to IEC 61518, form A
C Vent / test connection: ¼-18 NPT
Valve design: external spindle thread

2-spindle valve manifold DN 5 (7MF9412-1C..), dimensions in mm



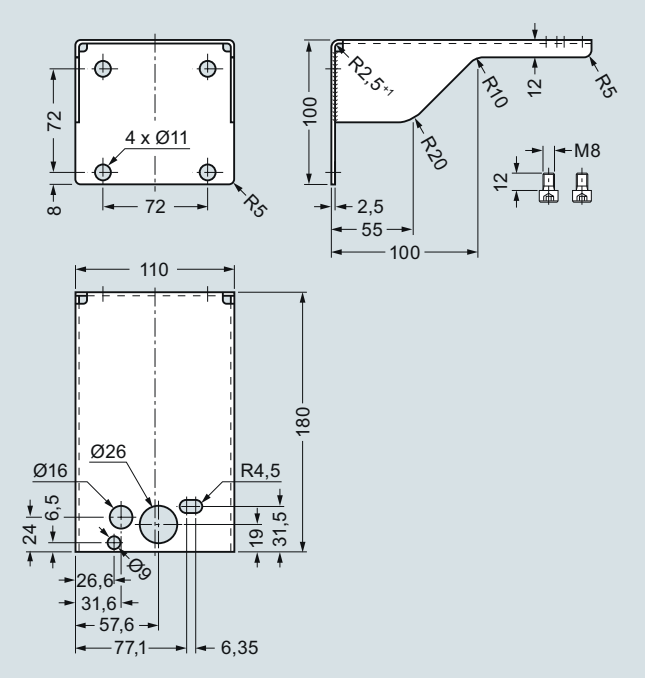
A Process connection: ½-14 NPT
B Transmitter connection: Flange connection IEC 61518, form A
Valve design: external spindle thread

3-spindle valve manifold DN 5 (7MF9412-1D..), dimensions in mm

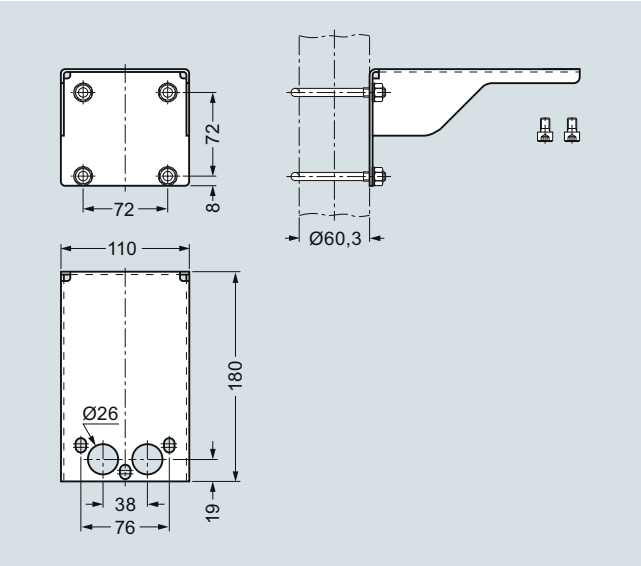


A Process connection: ½-14 NPT
B Transmitter connection: Flange connection to IEC 61518, form A
C Vent / test connection: ¼-18 NPT
Valve design: external spindle thread

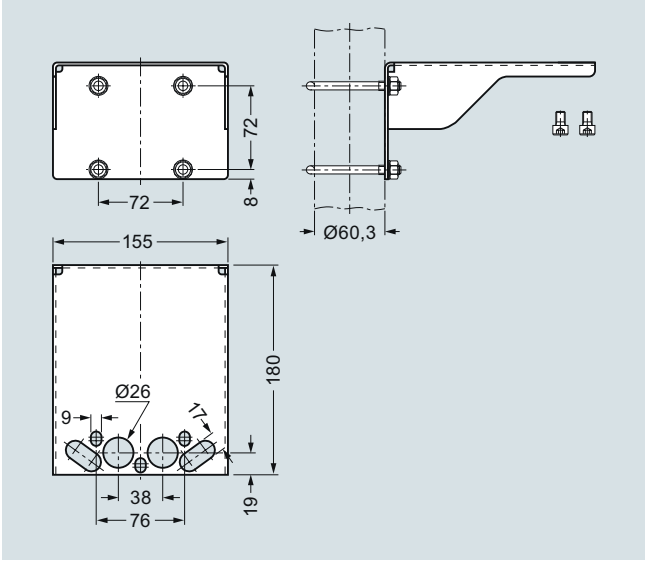
5-spindle valve manifold DN 5 (7MF9412-1E..), dimensions in mm



Mounting bracket (7MF9006-6LA)/(M14) for 2-spindle valve manifold, dimensions in mm

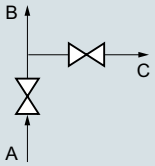


Mounting bracket (7MF9006-6NA)/(M17) for 3-spindle valve manifold, dimensions in mm



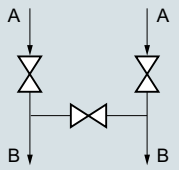
Mounting bracket (7MF9006-6PA)/(M18) for 5-spindle valve manifold, dimensions in mm

Schematics



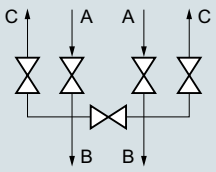
A Process connection
B Connection for pressure measuring device or transmitter for pressure or absolute pressure
C Vent/test connection

2-spindle valve manifold DN 5 (with rotating sleeve G½ or flange connection), connections



A Process connection
B Transmitter connection

3-spindle valve manifold DN 5, connections

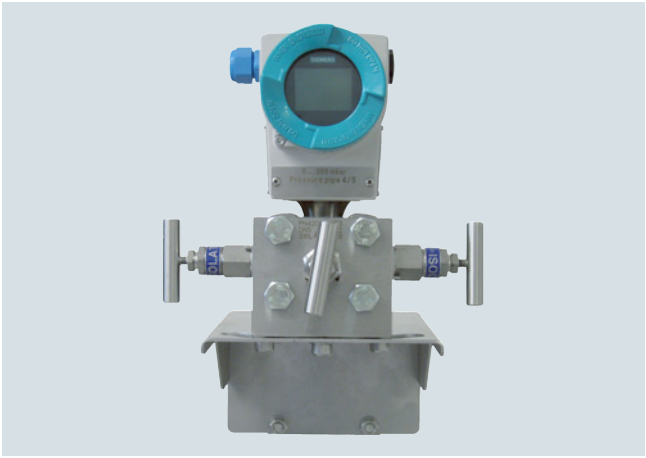


A Process connection
B Transmitter connection
C Vent/test connection

5-spindle valve manifold DN 5, connections

3- and 5-spindle valve manifolds for vertical angular differential pressure lines

Overview



These 3-spindle and 5-spindle valve manifolds 7MF9413-1.. were developed specially for vertical differential pressure lines.

The valve manifolds are used to shut off the differential pressure lines and to check the pressure transmitter zero.

The 5-spindle valve manifold permits venting on the transmitter side and checking of the pressure transmitter characteristic.

Benefits

- For vertical differential pressure lines
- Max. operating pressure 420 bar (6092 psi)
- Transmitters of the DS series can be operated and read from the front.

Application

The 3-spindle and 5-spindle valve manifolds for vertical differential pressure lines are for liquids and gases. The valve manifolds are flanged on the pressure transmitter.

Design

All versions of the spindle valve manifolds have a process connection ½-14 NPT.

The connection for the pressure transmitter is always designed as a flange connection to IEC 61518/DIN EN 61518, form B .

The 2-spindle and the 5-spindle valve manifold have in addition a vent and test connection ¼-18 NPT.

Materials used:

Component	Material	Mat. No.
Enclosure	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	Article No.
Valve manifolds for vertical differential pressure lines ↗	**7MF9413 - ■■ A**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
for liquids and gases for flanging to pressure transmitters for absolute and differential pressure Material: stainless steel, mat. No: 1.4404/316L max. working pressure 420 bar (6092 psi) (order accessory set with Order code), without certificate	
• 3-spindle valve manifold	**1 D**
• 5-spindle valve manifold	**1 E**
Accessories	
Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate EN 10204-3.1	**7MF9000-8AD**

Selection and Ordering data	Order code	Article No.
Further designs[1]		
Please add "**-Z**" to Article No. and specify Order code.		
Accessory set to EN (connection between valve manifold and pressure transmitter)		
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**
Accessory set to DIN[2] (connection between valve manifold and pressure transmitter)		
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 (2321 psi).	**K16**	**7MF9411-6BB**
Mounting bracket		
required **for wall mounting** or for securing to mounting rack, with bolts for mounting on valve manifold		
• for valve manifold 7MF9413-1D.	**M17**	**7MF9006-6NA**
• for valve manifold 7MF9413-1E.	**M18**	**7MF9006-6PA**
required **for mounting on 2" standpipe**, with bolts for mounting on valve manifold		
• for valve manifold 7MF9413-1D.	**M19**	**7MF9006-6QA**
Mounting clip		
2 off, to secure mounting bracket to pipe	**M16**	**7MF9006-6KA**
valve manifold 100 bar (1450 psi) suitable for oxygen		
• for valve manifold 7MF9413-1D.	**S13**	
• for valve manifold 7MF9413-1E.	**S14**	
NACE MR-0175-certified incl. inspection certificate 3.1 to EN 10204	**D07**	

1) When ordering accessory set or mounting together with the multiway cock, please use Order code; otherwise use Article No.

2) Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)!

Accessories

Accessory set (connection between valve manifold and transmitter)

- 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 (2321 psi)!

Mounting bracket for wall mounting or for securing to mounting rack

With bolts for mounting on valve manifold

- M17: For 3-spindle valve manifold
- M18: For 5-spindle valve manifold

Mounting bracket for mounting on 2" standpipe

With bolts for mounting on valve manifold

- M19: For 3-spindle valve manifold

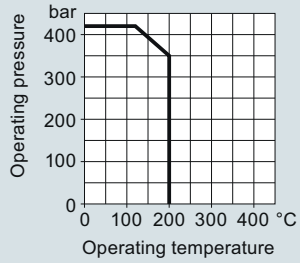
Mounting clips (2 off)

For securing the mounting brackets M17, M18 and M19 to pipe

Valve manifold 100 bar, suitable for oxygen

- For 3-spindle valve manifold
- For 5-spindle valve manifold

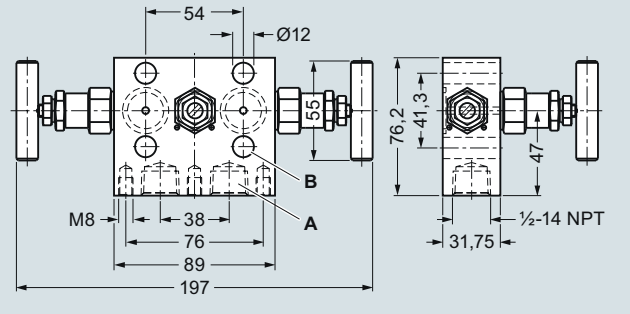
Characteristic curves



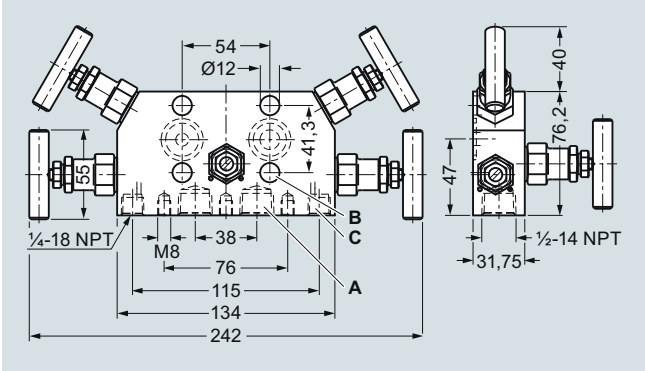
420 bar (6092 psi) at 120 °C (248 °F)
350 bar (5076 psi) at 200 °C (392 °F)

Permissible operating pressure as a function of the permissible operating temperature

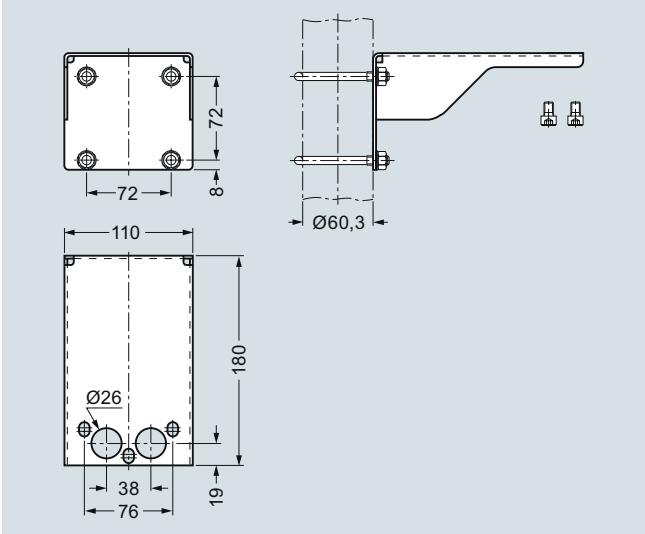
Dimensional drawings



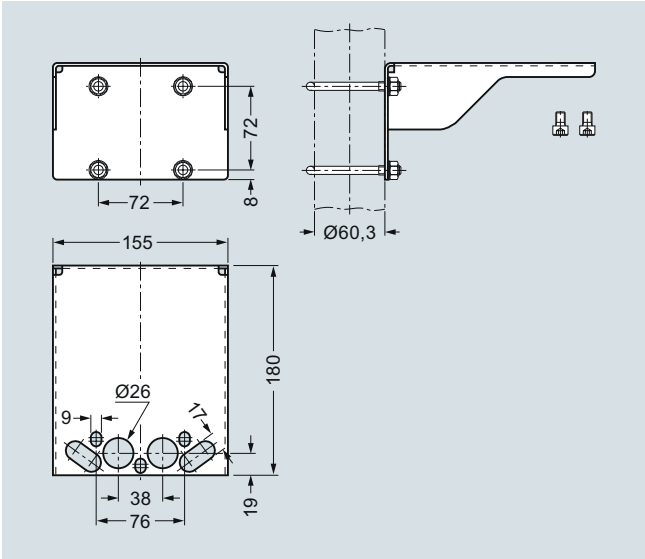
3-spindle valve manifold 7MF9413-1D. for vertical differential pressure lines, dimensions in mm



5-spindle valve manifold 7MF9413-1E. for vertical differential pressure lines, dimensions in mm

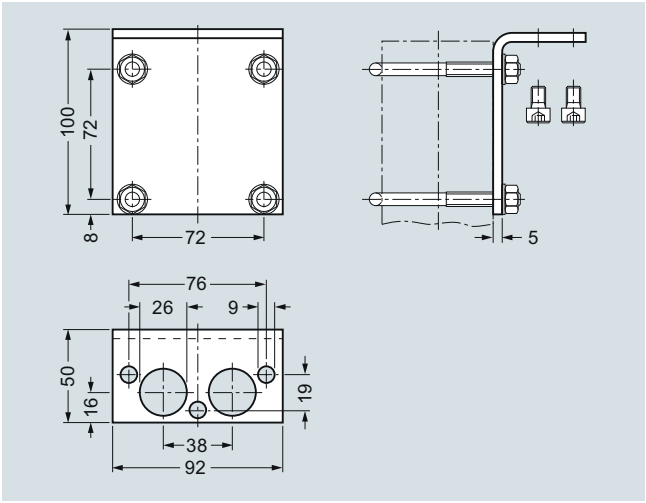


Mounting bracket (7MF9006-6NA)/(M17) for 3-spindle valve manifold, dimensions in mm



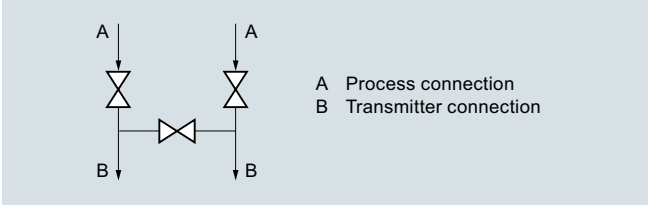
Mounting bracket (7MF9006-6PA)/(M18) for 5-spindle valve manifold, dimensions in mm

3- and 5-spindle valve manifolds for vertical angular differential pressure lines

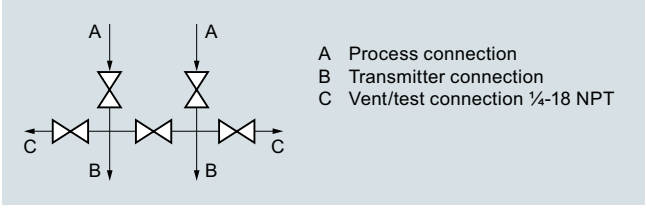


Mounting bracket (7MF9006-6QA)/(M19) for 3-spindle valve manifold, dimensions in mm

Schematics



3-spindle valve manifold for vertical differential pressure lines, connections



5-spindle valve manifold for vertical differential pressure lines, connections

Overview

The low-pressure multiway cock 7MF9004-4CA/-4DA can be flanged to pressure transmitters for differential pressure.

Benefits

- Robust design
- For liquids and gases
- One-hand operation

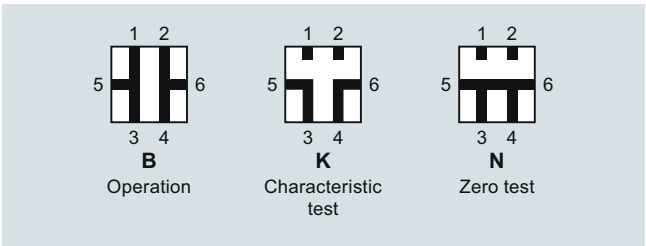
Design

The multiway cock has 2 process connections and 2 test connections, which are available in 2 versions (with sealing screws $G^3/_8$ or quick-release couplings). The enclosure is made of hot-pressed brass CuZn39Pb3, CW 614N. Test connections with sealing screws or with self-sealing quick-release couplings.

Note: An accessory set is always required for flanging of the multiway cock to a differential pressure transmitter.

Function

- Shutting off the differential pressure lines
- Testing the pressure transmitter zero
- Testing the pressure transmitter characteristic



Cock positions; the symbols are printed on the cock

Selection and Ordering data	Article No.
Low-pressure multiway cock for liquids and gases, for flanging to pressure transmitters, max. working pressure 25 bar (363 psi), max. working temperature 60 °C (140 °F) (up to 80 °C (176 °F) for a short time), weight 1.75 kg (without accessory set)	
Test connections	
2x sealing screws $G^3/_8$	**7MF9004-4CA**
2x quick-release couplings	**7MF9004-4DA**
Accessories	
Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate to EN 10204-3.1	**7MF9000-8AD**

Selection and Ordering data	Order code	Article No.
Further designs[1] Please add "**-Z**" to Article No. and specify Order code.		
Accessory set to EN (required for flanging, weight 0.2 kg) 4x screws $^7/_{16}$-20 UNF x 1 inch to ASME B18.2.1; chromized steel 2x gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)	**L31**	**7MF9004-5CC**
Accessory set to DIN (required for flanging, weight 0.2 kg) 4x screws M10x25 to DIN EN 24017; chromized steel 4x washers Ø 10.5 mm to DIN 125; 2x gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)		
• Standard design	**L11**	**7MF9004-6AD**
• Version for oxygen	**L15**	**7MF9004-6AE**
Multiway cock in oil-free and grease-free design BAM-tested lubricant, gasket suitable for oxygen	**S11**	
Mounting bracket required **for wall mounting** or for securing on rack (72 mm grid), made of electrogalvanized sheet-steel, weight 0.85 kg	**M13**	**7MF9004-6AA**

[1] When ordering accessory set or mounting together with the multiway cock, please use Order code; otherwise use Article No.

Low-pressure multiway cock

Accessories

Accessory set for low-pressure multiway cock

- L31: 4 screws $^{7}/_{16}$-20 UNF x 1 inch, 2 flat gaskets
- L11: 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets
- L15 (suitable for oxygen): 4 screws M10x25 to DIN EN 24017, 4 washers, 2 flat gaskets

Washers Ø 10.5 to DIN 125

Flat gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)

Multiway cock in oil-free and grease-free design

- S11: BAM-tested lubricant, gasket suitable for oxygen

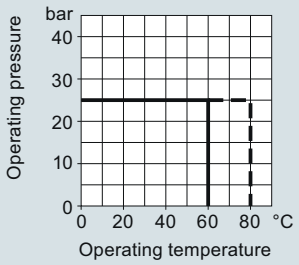
Mounting brackets

- M13: Required for wall mounting or for securing on rack (72 mm grid); made of electrogalvanized sheet-steel

Options

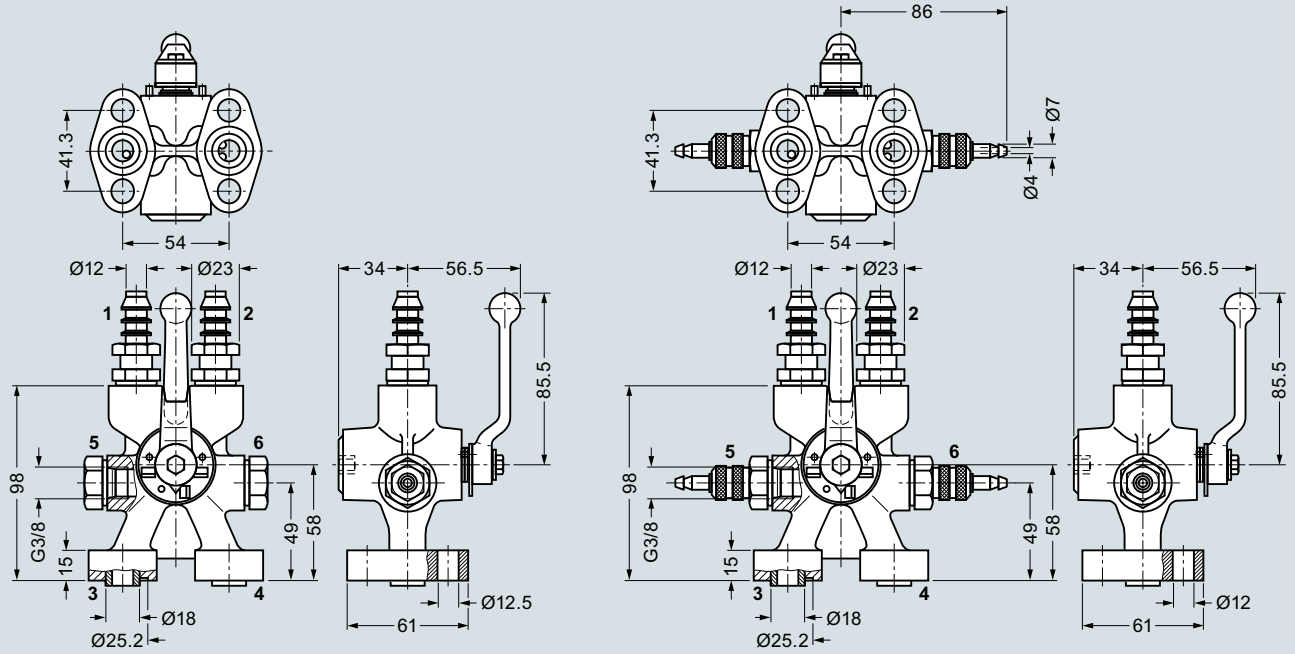
Test connections
- 2 sealing screws G$^{3}/_{8}$
- 2 quick-release couplings

Characteristic curves



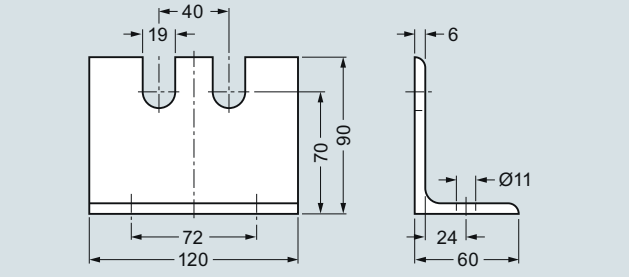
Low-pressure multiway cock, permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



1 and 2 Process connections (hose sleeve, diameter 12 mm)
3 and 4 Transmitter connections (IEC 61518, form A)
5 and 6 Test connections (with sealing screws G3/8 or with quick-release couplings

Low-pressure multiway cock 7MF9004-4CA/-4DA for direct flanging to pressure transmitters for differential pressure, dimensions in mm



Mounting bracket 7MF9004-6AA (M13), dimensions in mm

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 (5800 psi).

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 (6092 psi), 120 °C (248 °F)

Note: M10 screws only permissible up to PN 160 (2321 psi)!

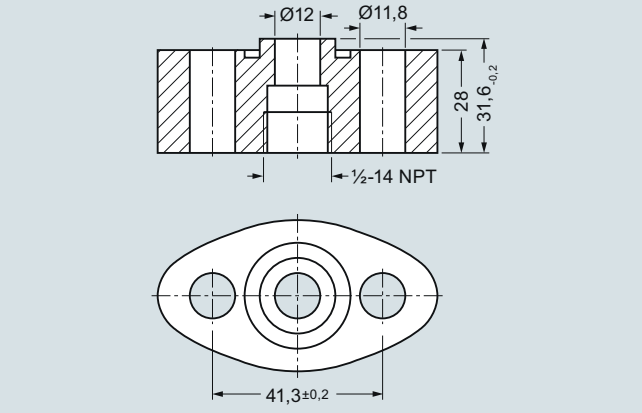
Selection and Ordering data	Article No.
Oval flange with female thread ½-14 NPT, max. working pressure 420 bar (6092 psi), flange connection to IEC 61518/DIN EN 61518, form A	
Material	
P250GH, mat. No.: 1.0460	**7MF9408-2CE**
X 2 CrNiMo 17 13 2, mat. No. 1.4404/316L	**7MF9408-2CL**

Selection and Ordering data	Order code	Article No.
Further designs[1] Please add "**-Z**" to Article 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 160 bar (2321 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 160 bar (2321 psi), 80 °C (176 °F)[2]	**E16**	**7MF9408-6BA**
NACE MR-0175-certified incl. inspection certificate 3.1 to EN 10204	**D07**	

[1] When ordering accessory set together with the oval flange, please use Order code; otherwise use Article No.

[2] Flange connections with M10 screws only permissible up to PN 160 (2321 psi)

Dimensional drawings



Oval flange 7MF9408-2C., dimensions in mm

1

Adapters

Overview

Adapters enable e.g. a transition from medium connections with NPT thread to shut-off valves to DIN 16270 ... 16272 or pipes in conjunction with a connection gland (e.g. 7MF9008).

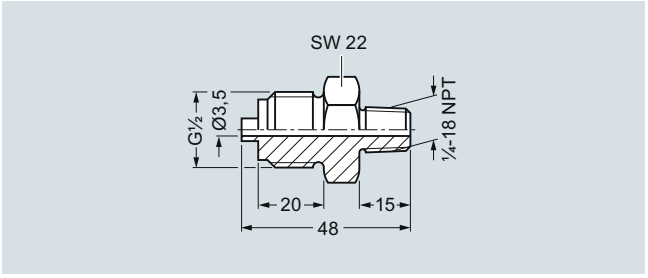
Design

The adapters are made of X 6 CrNiMoTi 17 12 2, mat. No. 1.4571 and available in 3 versions

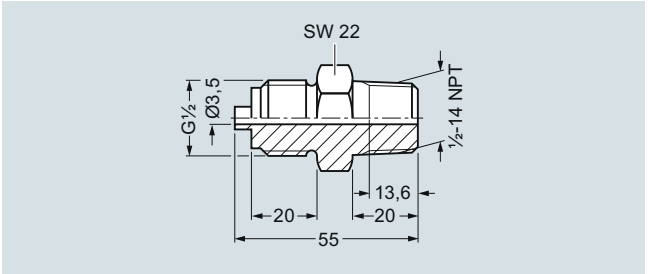
- Thread ¼-18 NPT and connection shank G½ to DIN EN 837-1
- Thread ½-14 NPT and connection shank G½ to DIN EN 837-1
- Thread ½-14 NPT and thread ½-14 NPT

Selection and Ordering data	Article No.
Adapters Max. operating pressure: 689 bar (10 000 psi), Weight: 0.2 kg	
with thread ¼-18 NPT – G½	**7MF9001-1AA**
with thread ½-14 NPT – G½	**7MF9001-1CA**
with thread ½-14 NPT – ½-14 NPT	**7MF9001-1DA**
with thread ½-14 NPT – M20 x 1.5	**7MF9001-1EA**
with pipe union with ferrule 12 S, max. operating pressure 630 bar (9 100 psi), Ø 12 mm – ½-14 NPT	
• 9 SMnPb 28, mat. No. 1.0718	**7MF9008-1CA**
• X 6 CrNiMoTi 17 122, mat. No. 1.4571	**7MF9008-1CB**
with pipe union with ferrule 14 S, max. operating pressure 630 bar (9 100 psi), Ø 14 mm – ½-14 NPT	
• 9 SMnPb 28, mat. No. 1.0718	**7MF9008-1CC**
• X 6 CrNiMoTi 17 122, mat. No. 1.4571	**7MF9008-1CD**

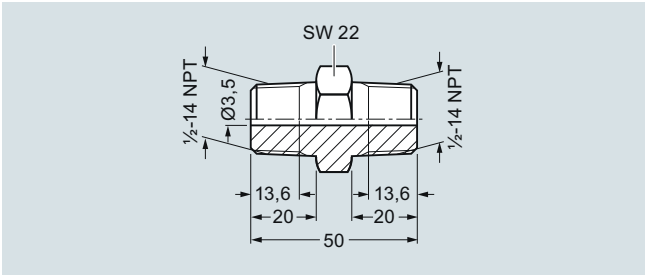
Dimensional drawings



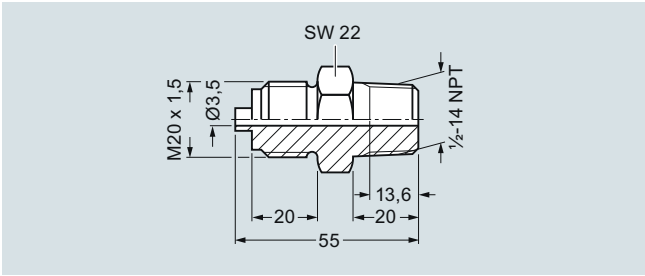
Adapter with thread ¼-18 NPT and connection shank G½ (7MF9001-1AA), dimensions in mm



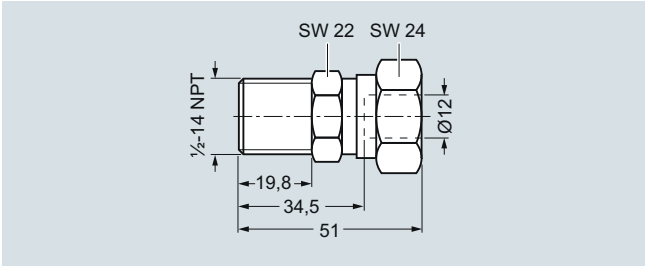
Adapter with thread ½-14 NPT and connection shank G½ (7MF9001-1CA), dimensions in mm



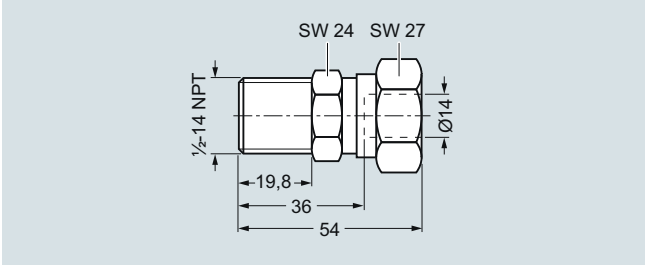
Adapter with thread ½-14 NPT and thread ½-14 NPT (7MF9001-1DA), dimensions in mm



Adapter with thread ½-14 NPT and connection shank M20 x 1.5 (7MF9001-1EA), dimensions in mm



Adapter with pipe union with ferrule 12 S, Ø 12 mm and thread ½-14 NPT (7MF9008-1CA and -1CB), dimensions in mm



Adapter with pipe union with ferrule 14 S, Ø 14 mm and thread ½-14 NPT (7MF9008-1CC and -1CD), dimensions in mm

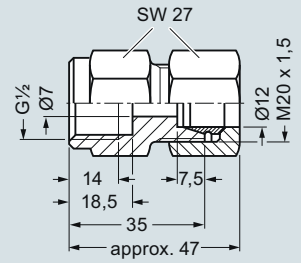
Overview

Connection glands to connect medium or differential pressure lines to collars G½ to DIN EN 837-1

- For rated pressures up to PN 630 (9137psi)
- For oxygen only up to PN 250 (3626 psi)

Selection and Ordering data		Article No.
Connection screwed gland for pipelines (weight 0.2 kg)		
Material	Design	
11SMn30 (mat. No. 1.0715)	Standard	**7MF9008-1GA**
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	Standard	**7MF9008-1GB**
X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	Grease-free	**7MF9008-1GC**

Dimensional drawings



Connection gland 7MF9008-1G., dimensions in mm

1

Connection parts G 1/2

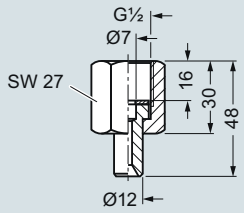
Overview

Connection parts G½ for pressure gauges and shut-off fittings are available in 3 versions:

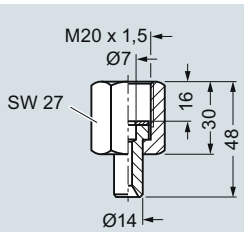
- Nipple connection
- Clamping sleeve
- Collar connection piece

Selection and Ordering data		Article No.
Adapters G½ for pressure gauges and shut-off fittings		
Nipple connection G½ to DIN 16284 (union nut with nipple and gasket); max. working pressure 400 bar (5802 psi); weight 0.1 kg; connection: G½ to DIN EN 837-1; Female thread G½		
Material	Mat. No.	
CuZn39Pb3	CW 614N	**M56340-A0001**
Union nut 9 SMn 28 k Nipple: RSt 37-2	1.0715 1.0037	**M56340-A0002**
Union nut X 8 CrNiS 18 9 Nipple: X 6 CrNiMoTi 17 12 2	 1.4305 1.4571/316Ti	**M56340-A0003**
Nipple connection M20 x 1.5 to DIN 16284 (union nut with nipple and gasket); max. working pressure 400 bar (5802 psi); weight 0.1 kg; connection: M20 x 1.5 to DIN EN 837-1; Female thread M20 x 1.5		
Material	Mat. No.	
Union nut X 8 CrNiS 18 9 Nipple: X 6 CrNiMoTi 17 12 2	 1.4305 1.4571/316Ti	**M56340-A0008**
Clamping sleeve G½ to DIN 16283; max. working pressure 400 bar (5802 psi); weight 0.1 kg; Connections: G½ to DIN EN 837-1; Female thread: G½ right-hand G½ left-hand		
Material	Mat. No.	
CuZn39Pb3	CW614N	**M56340-A0004**
9 SMn 28 k	1.0715	**M56340-A0005**
Collar-adapter max. working pressure; weight 0.1 kg; Connections: G½ to DIN EN 837-1; Male thread: G½, G½		
Material	Mat. No.	
CuZn39Pb3	CW614N	**M56340-A0006**
9 SMn 28 k	1.0715	**M56340-A0007**

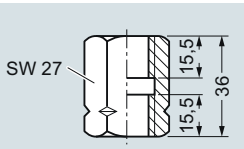
Dimensional drawings



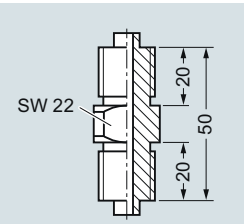
Nipple connection G½ (M56340-A0001 to -A0003), dimensions in mm



Nipple connection M20 x 1.5 (M56340-A0008), dimensions in mm



Clamping sleeve (M56340-A0004/-A0005), dimensions in mm



Collar connection piece (M56340-A0006/-A0007), dimensions in mm

Overview

Water traps protect pressure gauges and shut-off fittings from heating up (e.g. by steam) by the water column produced by the water trap.

The max. working temperature is 120 °C (248 °F) at 100 bar (1450 psi), 300 °C (572 °F) at 80 bar (1160 psi) or 400 °C (752 °F) at 63 bar (914 psi). If the temperature of the measured medium is higher, a sufficiently long line has to be connected upstream of the trap to enable heat dissipation.

Design

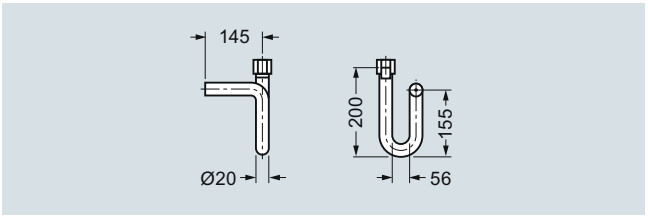
The water traps are available in U shape (type B) or circular shape (type D) to DIN 16282. They have a weld-on end Ø 20 mm × 2.6 mm on the measurement side. The connection on the device side is a clamping sleeve G½ to DIN 16283.

The water traps are made of steel (P250GH) or stainless steel (X 6 CrNiMoTi 17 12 2)

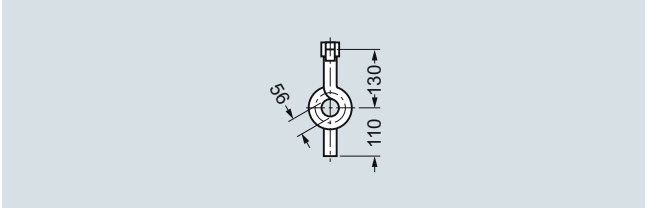
Water traps are designed as standard for max. operating temperature 120 °C (248 °F) at max. operating pressure 100 bar (1450 psi) (300 °C (572 °F) at 80 bar (1160 psi), 400 °C (752 °F) at 63 bar (914 psi). Water traps for higher operating pressures and temperatures are available on request.

Selection and Ordering data		Article No.
Water traps for pressure gauges and pressure transmitters, max. working temperature 120 °C (248 °F), max. working pressure 100 bar (1450 psi) (or 300 °C (572 °F) at 80 bar (1160 psi), or 400 °C (752 °F) at 63 bar (914 psi)), weight 0.7 kg		
Water trap B to DIN 16282		
Material	Mat. No.	
P235GH	1.0345	**M56340-A0043**
X 6 CrNiMoTi 17 12 2	1.4571/316Ti	**M56340-A0061**
Water trap D to DIN 16282		
Material	Mat. No.	
P235GH	1.0345	**M56340-A0045**
X 6 CrNiMoTi 17 12 2	1.4571/316Ti	**M56340-A0063**

Dimensional drawings



Water traps, type B, M56340-A0043/-A0061, dimensions in mm

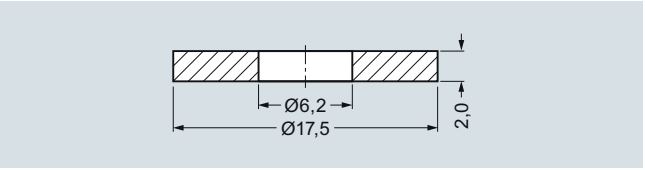


Water traps, type D, M56340-A0045/-A0063, dimensions in mm

Overview

The sealing rings to EN 837-1 are required to seal measuring instruments for pressure with the process connection G½B.

Dimensional drawings



Sealing ring 7MF9007-7A. to EN 837-1, dimensions in mm

Selection and Ordering data	Article No.
Sealing ring to EN 837-1 for thread G½ made of (packing unit 100 pcs)	
• Copper	**7MF9007-7AA**
• Soft iron	**7MF9007-7AB**
• Stainless steel, mat.-No. 1.4571	**7MF9007-7AC**
• PTFE	**7MF9007-7AD**
Accessories	
Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate to EN 10204-3.1	**7MF9000-8AD**

1

Pressure surge reducers

Overview

The pressure surge reducer protects the pressure gauge against damage, premature wear and tear and inaccurate/fluctuating indications.

Application

The pressure reducer is used when pulsations occur in the measured medium (e.g. in slow-running vapor engines, piston pumps and compressors), or if drastic fluctuations are likely to occur in the measured medium (e.g. in hydraulic presses and tensile testing machines).

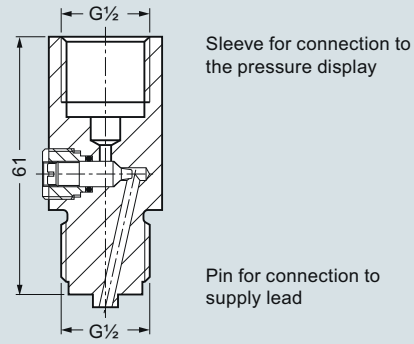
Design

- Enclosure made of brass or stainless steel (mat. no. 1.4571)
- Adjustable nozzle
- Sleeve for connection to the measuring instrument
- Pin for connection to supply lead

Selection and Ordering data

			Article No.
Pressure surge reducer Weight approx. 0.21 kg			
Material	Full-scale value	Weight approx. in kg	
Brass	250 bar (3626 psi)	0.21	**M56340-A54**
Stainless steel	600 bar (8702 psi)	0.21	**M56340-A59**

Dimensional drawings



Pressure surge reducer, dimensions in mm

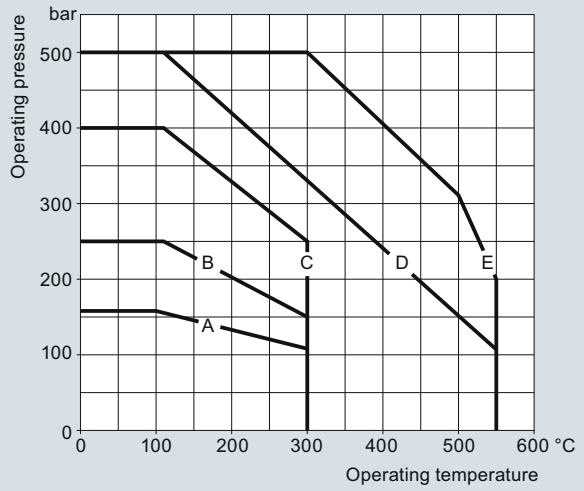
Overview

Primary shut-off valves are available in the following versions:

- For non-corrosive liquids, gases and vapors
- For corrosive liquids and gases
- Grease-free for oxygen

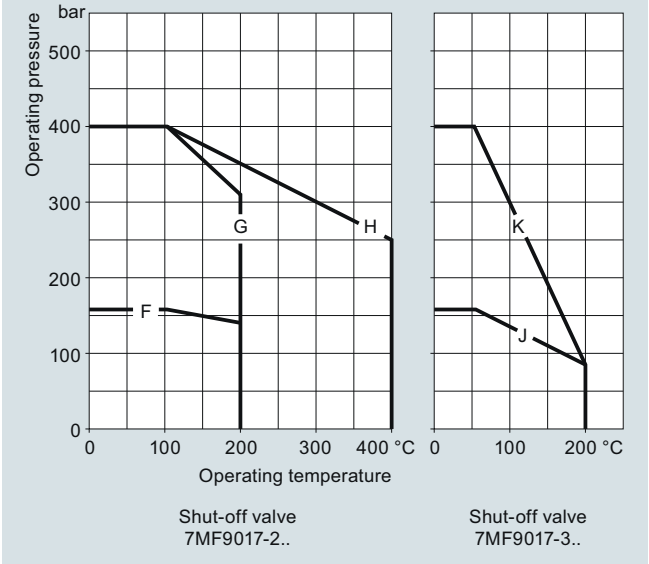
The shut-off valves are available in various materials and with various connections (see Selection and Ordering data)

Characteristic curves



Shut-off valve 7MF9017-1..

Shut-off valve 7MF9017-1.., permissible working pressure as a function of the permissible working temperature

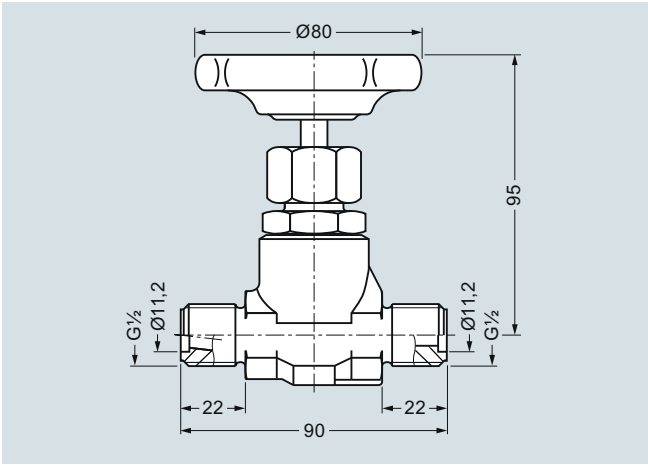


Shut-off valve 7MF9017-2..

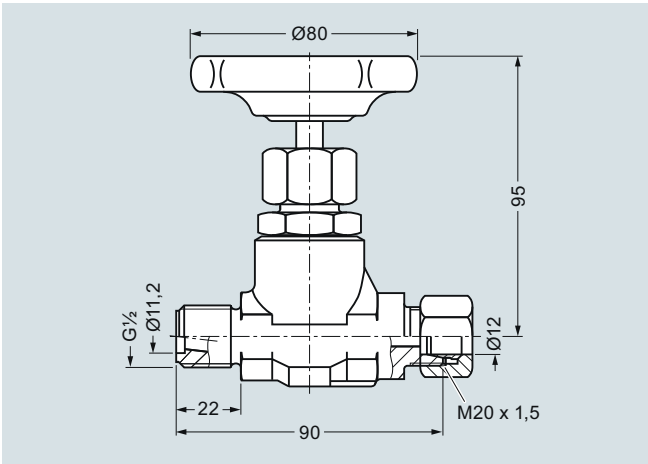
Shut-off valve 7MF9017-3..

Shut-off valves 7MF9017-2.. and -3.., permissible working pressure as a function of the permissible working temperature

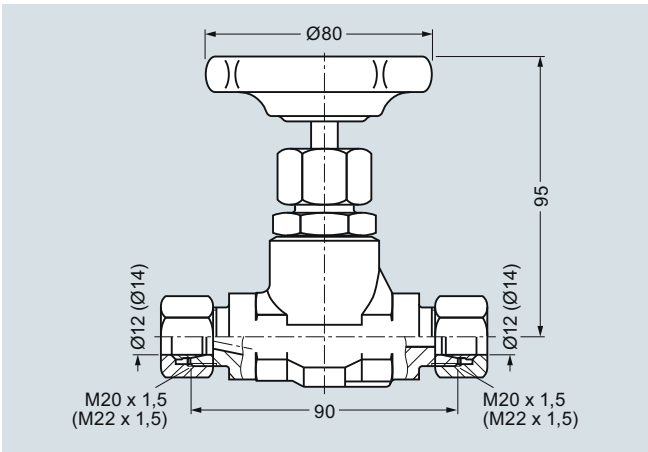
Dimensional drawings



Shut-off valve 7MF9017–1A., dimensions in mm



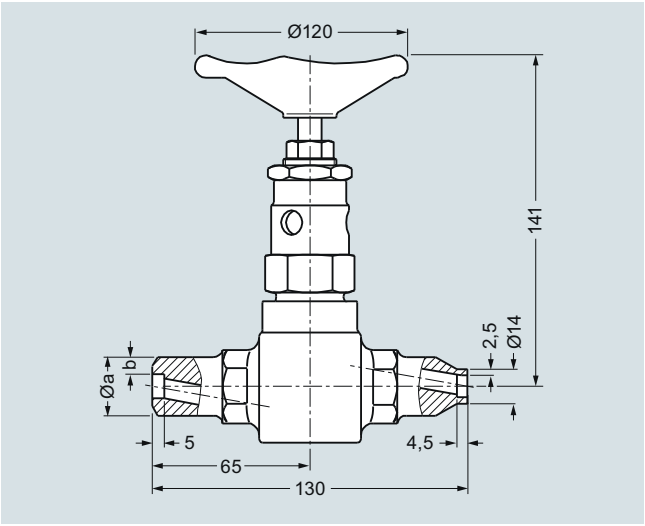
Shut-off valve 7MF9017-1B. and -2B., dimensions in mm



Shut-off valves 7MF9017-1C., -1D. and -2C., dimensions in mm

1

Primary shut-off valves



Shut-off valves 7MF9017-, dimensions in mm

Ø A x b	7MF9017-
14 mm x 2.5 mm	1F. and 1G.
21.3 mm x 6.3 mm	1H. and 2H.
24 mm x 7.1 mm	1J., 1K. and 2J.

Selection and Ordering data

Primary shut-off valves, without certificate

Max. working pressure	Charac-teristic[1)]	Material	Mat. No.	Spindle thread	Connections	Approx. weight kg	Article No.
Shut-off valve for non-aggressive liquids, gases and vapors							↗ **7MF9017-1** ■ **A**
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.							
160 bar (2321 psi)	A	P250GH	1.0460	Internal	Threaded socket G½ form R, DIN 19207	0.8	**A**
160 bar (2321 psi)	A	P250GH	1.0460	Internal	Threaded socket G½ form R, DIN 19207 DIN 19207 and pipe union with ferrule for pipe Ø 12 mm, S series	0.8	**B**
400 bar (5800 psi)	C	P250GH	1.0460	Internal	Pipe union with ferrule for pipe Ø 12 mm, S series	1	**C**
400 bar (5800 psi)	C	P250GH	1.0460	Internal	Pipe union with ferrule for pipe Ø 14 mm, S series	1	**D**
500 bar (7252 psi)	D	16 Mo 3	1.5415	External	Welding sleeves Ø 14 mm × 2.5 mm	1.6	**F**
500 bar (7252 psi)	E	11 CrMo 9 10	1.7383	External	Welding sleeves Ø 14 mm × 2.5 mm	1.6	**G**
500 bar (7252 psi)	D	16 Mo 3	1.5415	External	Welding sleeves Ø 21.3 mm × 6.3 mm and Ø 14 mm × 2.5 mm	1.6	**H**
500 bar (7252 psi)	D	16 Mo 3	1.5415	External	Welding sleeves Ø 24 mm × 7.1 mm and Ø 14 mm × 2.5 mm	1.6	**J**
500 bar (7252 psi)	E	11 CrMo 9 10	1.7383	External	Welding sleeves Ø 24 mm × 7.1 mm and Ø 14 mm × 2.5 mm	1.6	**K**
Shut-off valve for aggressive liquids and gases							↗ **7MF9017-2** ■ **A**
160 bar (2321psi)	F	X 6 CrNiMoTi 17 12 2	1.4571/ 316Ti	Internal	Threaded socket G½ form R, DIN 19207 DIN 19207 and pipe union with ferrule for pipe Ø 12 mm, S series	0.8	**B**
400 bar (5800 psi)	G	X 6 CrNiMoTi 17 12 2	1.4571/ 316Ti	Internal	Pipe union with ferrule for pipe Ø 12 mm, S series	1	**C**
400 bar (5800 psi)	H	X 6 CrNiMoTi 17 12 2	1.4571/ 316Ti	External	Welding sleeves Ø 21.3 mm × 6.3 mm and Ø 14 mm × 2.5 mm	1.6	**H**
400 bar (5800 psi)	H	X 6 CrNiMoTi 17 12 2	1.4571/ 316Ti	External	Welding sleeves Ø 24 mm × 7.1 mm and Ø 14 mm × 2.5 mm	1.6	**J**

Accessories

Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate EN 10204-3.1	**7MF9000-8AD**

[1)] See Figure "Permissible working pressure as a function of the permissible working temperature"

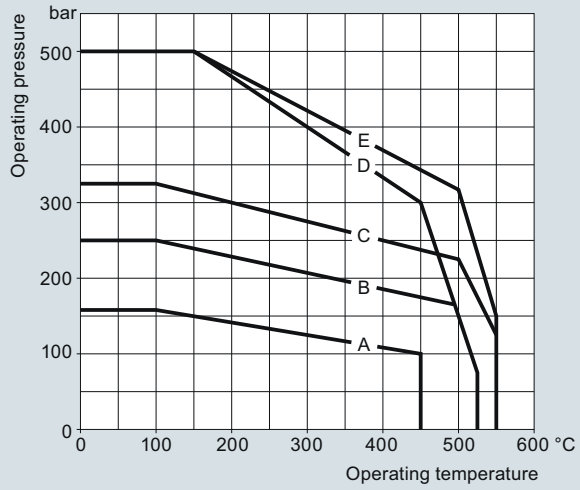
Overview

The compensation vessels prevent the level difference which occurs with pressure changes in the pressure lines and which falsifies the measurement.

According to DIN 19211, the temperature in the compensation vessel must be assumed to be 50 K less than the steam temperature in the pipe when calculating the wall thicknesses. This is because the temperature in the compensation vessel during operation can only rise up to the saturated steam temperature.

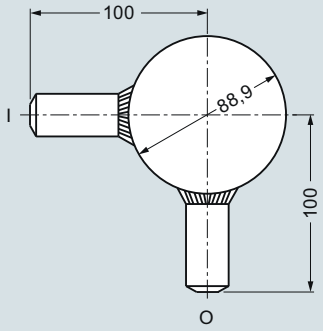
A material inspection certificate A to EN 10204-3.1 is available for the materials from which the compensation vessels are made.

Characteristic curves



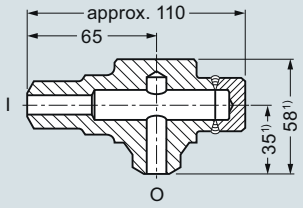
Permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



I Input (see Ordering data for dimensions)
O Output (see Ordering data for dimensions)

Compensation vessel 7MF9015-1.., dimensions in mm



I Input (see Ordering data for dimensions)
O Output (see Ordering data for dimensions)
1) 30 mm longer with 7MF9015-5A.

Compensation vessel 7MF9015-5.., dimensions in mm

Selection and Ordering data

Compensation vessel, without certificate

Max. working pressure	Characteristic[1]	Material	Mat. No.	Connections Input	Output	Approx. contents cm³	Approx. weight kg	Article No. 7MF9015- ■■A
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.								
160 bar (2321 psi)	A	16 Mo 3	1.5415	Threaded socket G½, form R, DIN 19207	Threaded socket G½, form V, DIN 19207	250	0.8	1 A
250 bar (3626 psi)	B	16 Mo 3	1.5415	Welding sleeve Ø 21.3 mm × 6.3 mm	Welding sleeve Ø 21.3 mm × 6.3 mm	250	0.8	1 B
250 bar (3626 psi)	B	16 Mo 3	1.5415	Welding sleeve Ø 24 mm × 7.1 mm	Welding sleeve Ø 24 mm × 7.1 mm	250	1	1 C
500 bar (7252 psi)	E	11 CrMo 9 10	1.7383	Welding sleeve Ø 24 mm × 7.1 mm	Welding sleeve Ø 24 mm × 7.1 mm	170	1	1 D
250 bar (3626 psi)	B	16 Mo 3	1.5415	Welding sleeve Ø 33.7 mm × 4.5 mm	Welding sleeve Ø 24 mm × 7.1 mm	700	0.7	1 E
160 bar (2321 psi)	A	16 Mo 3	1.5415	Threaded socket G½, form R, DIN 19207	Threaded socket G½, form V, DIN 19207	20	1.6	5 A
500 bar (7252 psi)	D	16 Mo 3	1.5415	Welding sleeve Ø 21.3 mm × 6.3 mm	Welding sleeve Ø 21.3 mm × 6.3 mm	20	1.6	5 B
500 bar (7252 psi)	D	16 Mo 3	1.5415	Welding sleeve Ø 24 mm × 7.1 mm	Welding sleeve Ø 24 mm × 7.1 mm	20	1.6	5 C
500 bar (7252 psi)	E	11 CrMo 9 10	1.7383	Welding sleeve Ø 24 mm × 7.1 mm	Welding sleeve Ø 24 mm × 7.1 mm	20	1.6	5 D

Accessories

Factory certificate according to EN 10204–2.2	**7MF9000-8AB**
Material inspection certificate EN 10204-3.1	**7MF9000-8AD**

1) See Figure "Permissible working pressure as a function of the permissible working temperature"

Overview

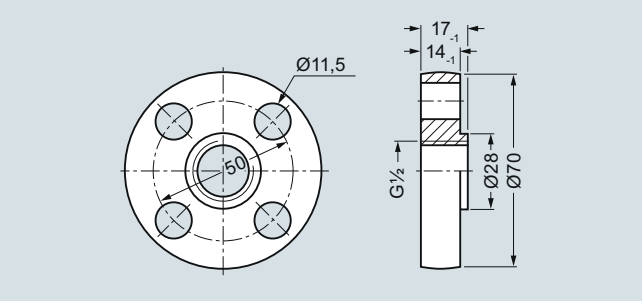
Connection parts are available in the following versions:

- Threaded flange pair G½ with stainless steel gasket
- Nipple G½ form V to DIN 19207
- Union nut G½ made of C 35 to DIN 16284
- Gasket B½ (grooved) to DIN 19207

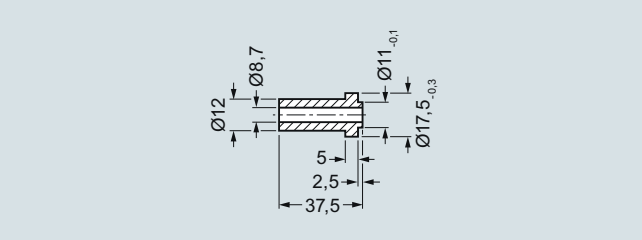
All connection parts are also available grease-free for oxygen.

Selection and Ordering data	Article No.
Threaded flange pair G½	
• with stainless steel gasket	**7MF9007-4CA**
• grease-free for oxygen, with stainless steel gasket	**7MF9007-4DA**
Scope of delivery:	
2x threaded flanges G½ to DIN 19207; material: P250GH (mat. No. 1.0460)	
4x hexagon screws M10x45 to DIN EN 24014; Material: C35E (mat. No. 1.1181)	
4x hexagon screws M10x50 to DIN EN 24032	
1x gasket G½ (7MF9007-6BA) grooved, to DIN 19207; Material: X 6 CrNiMoTi 17 12 2 (mat. No. 14571/316Ti)	
Only for 7MF9007-4CA!	
1x gasket G½ (7MF9k007-6CA), grease-free for oxygen, grooved, to DIN 19207; Material: X 6 CrNiMoTi 17 12 2 (mat. No. 14571/316Ti)	
Only for 7MF9007-4DA!	
Nipple G½	
to DIN 19207	
• Material: 16 Mo 3 (mat. No. 1.5415)	**7MF9007-4KA**
• grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	**7MF9007-4LA**
Union nut G½	
to DIN 16284	
• Material: C35E (mat. No. 1.1181)	**7MF9007-4MA**
• grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	**7MF9007-4NA**
Gasket G½	
to DIN 19207, grooved	
• Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	**7MF9007-6BA**
• grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)	**7MF9007-6CA**

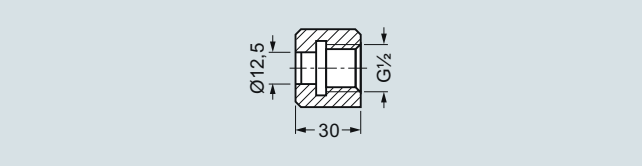
Dimensional drawings



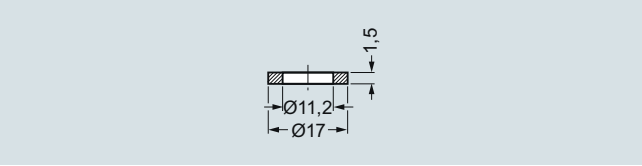
Threaded flange 7MF9007-4CA/-4DA, dimensions in mm



Nipple G½ 7MF9007-4KA/-4LA, dimensions in mm



Union nut G½ 7MF9007-4MA/-4NA, dimensions in mm



Gasket 7MF9007-6BA/-6CA, dimensions in mm