

Pressure Measurement



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- 1/422 - with flexible capillary
- 1/429 - mounted directly on transmitter
- 1/434 - mounted directly and with capillary
- Diaphragm seal, screwed design
- 1/440 - mounted directly or/and with capillary
- 1/444 Quick-release diaphragm seals
- 1/450 Miniature diaphragm seals
- 1/452 Inline seals in sandwich design
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You can download all instructions, catalogs and certificates for SITRANS P free of charge at the following Internet address: www.siemens.com/sitransp








Overview




Application	Description	Software for parameterization
SITRANS P Single-range transmitters for general applications		
	SITRANS P200 Two or three-wire transmitters for measuring gauge and absolute pressure <ul style="list-style-type: none"> Single-range transmitters for gauge and absolute pressure Ceramic measuring cell For general applications 	1/6 –
	SITRANS P210 Single-range transmitters for gauge pressure <ul style="list-style-type: none"> Stainless steel measuring cell For low-pressure applications 	1/12 –
	SITRANS P220 Single-range transmitters for gauge pressure <ul style="list-style-type: none"> Stainless steel measuring cell, fully welded For high-pressure applications and refrigeration technology 	1/17 –
	SITRANS LH100 Two-wire transmitter for measuring hydrostatic levels <ul style="list-style-type: none"> For measuring liquid levels in wells, tanks, channels, dams etc. With ceramic diaphragm, Ø 23.4 mm 	1/23 –
	SITRANS LH300 Two-wire transmitter for measuring hydrostatic levels <ul style="list-style-type: none"> For measuring liquid levels in wells, tanks, channels, dams etc. With ceramic diaphragm, Ø 30 mm Suitable for small measuring ranges 	1/28 –
 	SITRANS P Compact Transmitters for gauge and absolute pressure for food, pharmaceuticals and biotechnology <ul style="list-style-type: none"> 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		
 	SITRANS P300 Two-wire transmitters for measuring gauge and absolute pressure <ul style="list-style-type: none"> 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 G 1/2", 1/2-NPT and front-flush process connections available Range adjustment 100 : 1 	1/43 SIMATIC PDM
	Factory-mounting of valve manifolds on SITRANS P300 transmitters <ul style="list-style-type: none"> Simplified assembly With pressure test Stainless steel valve manifolds 	1/66 –
SITRANS P · Transmitters for gauge pressure for the paper industry		
	SITRANS P300 and SITRANS P DS III with PMC connection for the paper industry Two-wire transmitters for measuring gauge pressure <ul style="list-style-type: none"> 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

Pressure Measurement

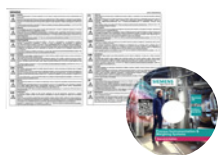
Product overview

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Application	Description		Software for parameterization
SITRANS P Transmitters for applications with advanced requirements (Advanced)			
	Two-wire transmitters for measuring: <ul style="list-style-type: none"> Gauge pressure, Absolute pressure, Differential pressure and Flow or Level 	SITRANS P320/P420 <ul style="list-style-type: none"> Measuring accuracy: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> Gauge pressure, Absolute pressure, Differential pressure and Flow or Level 	SITRANS P DS III <ul style="list-style-type: none"> Measuring accuracy up to 0.065 % Range adjustment: 100 : 1 Parameterization using: <ul style="list-style-type: none"> 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 	1/167 SIMATIC PDM
		Factory mounting of valve manifolds on gauge, absolute or differential pressure transmitters SITRANS P DS III <ul style="list-style-type: none"> Simplified assembly With pressure test Stainless steel valve manifolds 	1/254 –
	Two-wire transmitters for measuring: <ul style="list-style-type: none"> Gauge pressure, Differential pressure and Flow 	SITRANS P410 <ul style="list-style-type: none"> Measuring accuracy up to 0.04 % Range adjustment 100 : 1 Parameterization using: <ul style="list-style-type: none"> 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 	1/258 SIMATIC PDM
		Factory mounting of valve manifolds on gauge, absolute or differential pressure transmitters SITRANS P410 <ul style="list-style-type: none"> 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 1/254). 	–
SITRANS P - Transmitters for applications with highest requirements (Premium)			
	Two-wire transmitters for measuring: <ul style="list-style-type: none"> Differential pressure Volume flow Mass flow Level Volume Mass 	SITRANS P500 <ul style="list-style-type: none"> Measuring accuracy up to 0.03 % Range adjustment: 200 : 1 High measuring accuracy Very fast response time Extremely good long-term stability Parameterization using 3 buttons or HART 	1/298 SIMATIC PDM
		Factory-mounting of manifolds on differential pressure transmitters SITRANS P500 <ul style="list-style-type: none"> Simplified assembly With pressure test Stainless steel valve manifolds 	1/322 –

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 Remote seals for SITRANS P300, P DS III, P410, P500
	<ul style="list-style-type: none"> • Remote seals in sandwich and flange designs • Quick-release remote seals for the food industry • Wide range of diaphragm materials and fill fluid available 	1/325 1/402
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
		1/472
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	• Connection glands	1/507
	• Connection parts G½	1/508
	• Water traps	1/509
	• Sealing rings to EN 837-1	1/509
	• Pressure surge reducers	1/510
	• Primary shut-off valves	1/511
	• Compensation vessels	1/513
	• Connection parts	1/514

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.

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P200 for gauge and absolute pressure

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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.

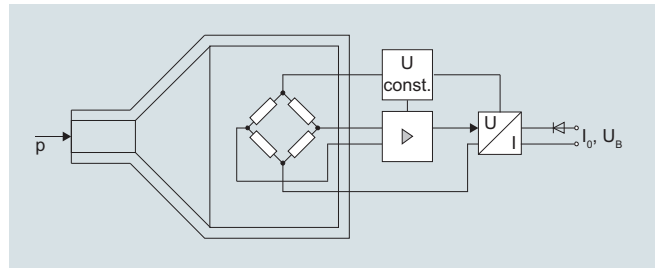
Device structure with explosion protection

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		Electromagnetic compatibility	
Gauge and absolute pressure measurement	Liquids, gases and vapors		<ul style="list-style-type: none"> • acc. IEC 61326-1/-2/-3 • acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation $\leq 1\%$
Mode of operation		Design	
Measuring principle	Piezo-resistive measuring cell (ceramic diaphragm)	Weight	Approx. 0.090 kg (0.198 lb)
Measured variable	Gauge and absolute pressure	Process connections	See dimension drawings
Inputs		Electrical connections	<ul style="list-style-type: none"> • Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11 • Device plug M12 • 2 or 3-wire (0.5 mm²) cable ($\varnothing \pm 5.4$ mm) • Quickon cable quick screw connection
Measuring range		Wetted parts materials	
<ul style="list-style-type: none"> • Gauge pressure - Metric - US measuring range 	1 ... 60 bar (15 ... 870 psi) 15 ... 1000 psi	<ul style="list-style-type: none"> • Measuring cell • Process connection • Gasket 	Al ₂ O ₃ - 96 % Stainless steel, mat. No. 1.4404 (SST 316 L) <ul style="list-style-type: none"> • FPM (Standard) • Neoprene • Perbunan • EPDM
<ul style="list-style-type: none"> • Absolute pressure - Metric - US measuring range 	0.6 ... 16 bar a (10 ... 232 psi abs a) 10 ... 300 psi a	Non-wetted parts materials	
Output		<ul style="list-style-type: none"> • Enclosure • Rack • Cables 	Stainless steel, mat. No. 1.4404 (SST 316 L) Plastic PVC
Current signal	4 ... 20 mA	Certificates and approvals	
<ul style="list-style-type: none"> • Load • Auxiliary power U_B 	(U _B - 10 V)/0.02 A DC 7 ... 33 V (10 ... 30 V for Ex)	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)
Voltage signal	0 ... 10 V DC	Lloyd's Register of Shipping (LR) ¹⁾	12/20010
<ul style="list-style-type: none"> • Load • Auxiliary power U_B • Power consumption 	≥ 10 k Ω 12 ... 33 V DC < 7 mA at 10 k Ω	Germanischer Lloyd (GL) ¹⁾	GL19740 11 HH00
Ratiometric output	0 ... 90 %	American Bureau of Shipping (ABS) ¹⁾	ABS_11_HG 789392_PDA
<ul style="list-style-type: none"> • Load • Auxiliary power U_B • Power consumption 	≥ 10 k Ω 5 V DC $\pm 10\%$ < 7 mA at 10 k Ω	Bureau Veritas (BV) ¹⁾	BV 271007A0 BV
Characteristic curve	Linear rising	Det Norske Veritas (DNV) ¹⁾	A 12553
Measuring accuracy		Drinking water approval (ACS) ¹⁾	ACS 15 ACC NY 360
Error in measurement at limit setting incl. hysteresis and reproducibility	<ul style="list-style-type: none"> • Typical: 0.25 % of measuring span • Maximum: 0.5 % of measuring span 	EAC ¹⁾	№ TC RU C-DE.ГБ05.B.00732 OC НАННО «ЦБЭ»
Step response time T ₉₉	< 5 ms	Underwriters Laboratories (UL) ¹⁾	UL 20110217 - E34453
Long-term stability		<ul style="list-style-type: none"> • for USA and Canada • worldwide 	IEC UL DK 21845
<ul style="list-style-type: none"> • Lower range value and measuring span 	0.25 % of measuring span/year	Explosion protection	
Influence of ambient temperature		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
<ul style="list-style-type: none"> • Lower range value and measuring span • Influence of power supply 	0.25 %/10 K of measuring span 0.005 %/V	EC type-examination certificate	SEV 10 ATEX 0146
Conditions of use		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
Process temperature with gasket made of:		Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	L _i = 0 nH; C _i = 0 nF
<ul style="list-style-type: none"> • FPM (Standard) • Neoprene • Perbunan • EPDM 	-15 ... +125 °C (+5 ... +257 °F) -35 ... +100 °C (-31 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -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)	<ul style="list-style-type: none"> • 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 		

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

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P200 for gauge and absolute pressure

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Selection and ordering data

Article No.

Order code

SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications

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.

Max.

Burst pressure

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)

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 a)	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)

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

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

Selection and ordering data	Article No.	Order code
SITRANS P 200 pressure transmitters for pressure and absolute pressure for general applications	7MF1565	
Accuracy typ. 0.25 %		
Wetted parts materials: Ceramic and stainless steel + sealing material		
Non-wetted parts materials: stainless steel		
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		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)		
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 inH ₂ O 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 Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11	
Oxygen version, free of oil and degreased, max. operating pressure 60 bar, max. process temperature +85 °C (only in conjunction with the sealing material Viton between sensor and enclosure and not with explosion protection version)	E10	

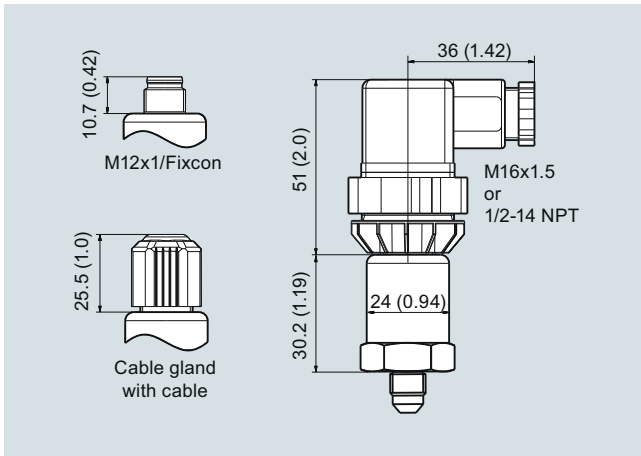
Pressure Measurement

Pressure transmitters

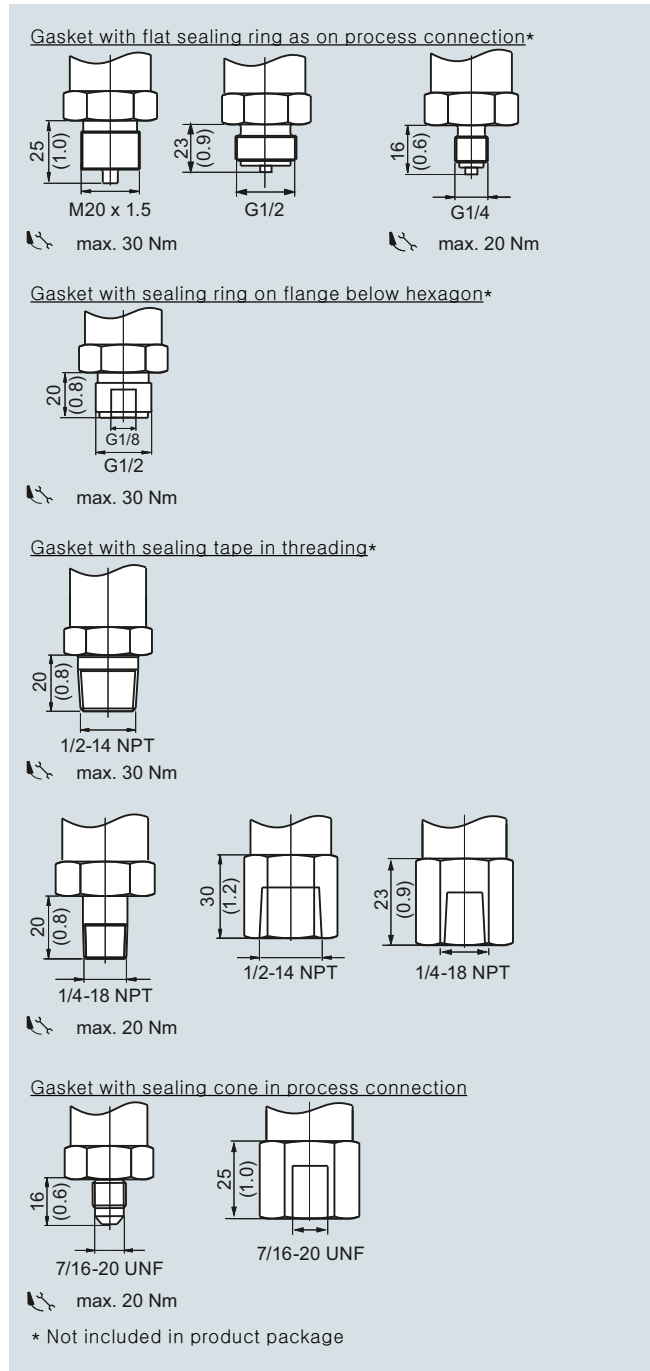
Single-range transmitters for general applications

SITRANS P200 for gauge and absolute pressure

Dimensional drawings



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



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

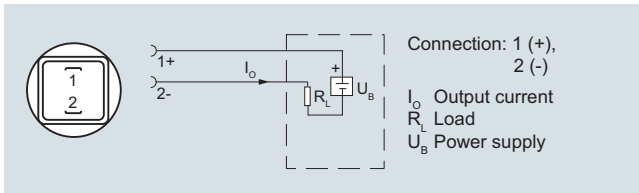
Pressure Measurement

Pressure transmitters

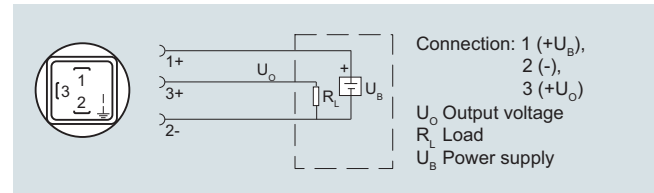
Single-range transmitters for general applications

SITRANS P200 for gauge and absolute pressure

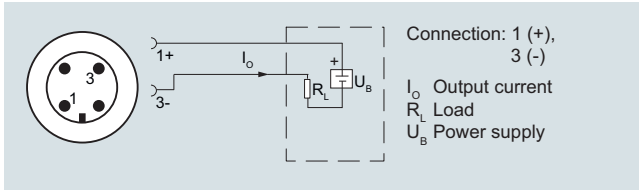
1

Schematics

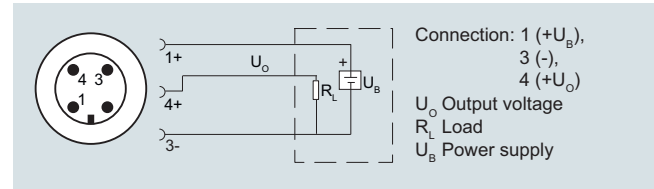
Connection with current output and connector per EN 175301



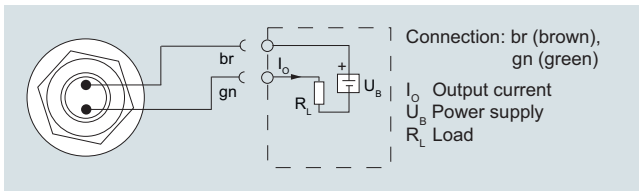
Connection with voltage output, ratiometric output and plug according to EN 175301



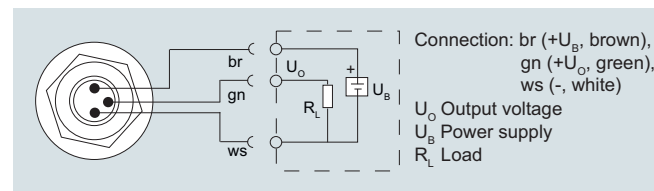
Connection with current output and device plug M12x1



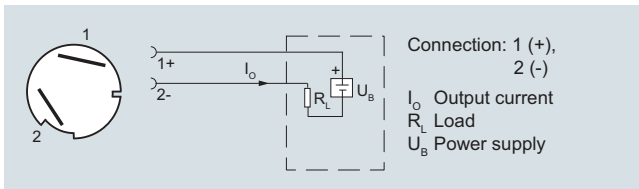
Connection with voltage output, ratiometric output and device plug M12x1



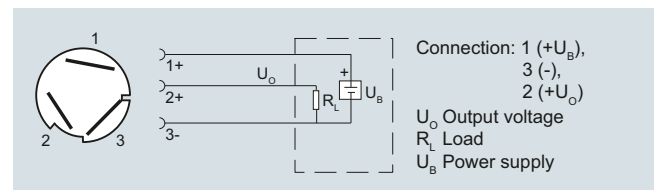
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



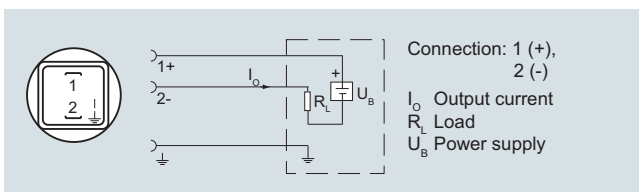
Connection with current output and Quickon cable quick screw connection



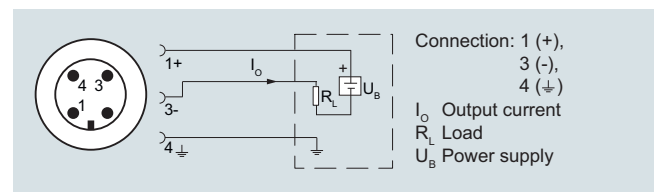
Connection with voltage output, ratiometric output and Quickon fast cable termination

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)

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P210 for gauge pressure

1

Overview



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

- Stainless steel 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.

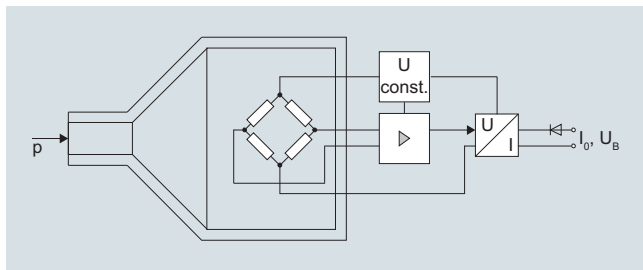
Device structure with explosion protection

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		Design	
Gauge measurement	Liquids, gases and vapors	Weight	Approx. 0.090 kg (0.198 lb)
Mode of operation		Process connections	See dimension drawings
Measuring principle	Piezoresistive measuring cell (stainless steel diaphragm)	Electrical connections	<ul style="list-style-type: none"> Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11 Device plug M12 2 or 3-wire (0.5 mm²) cable (Ø ± 5.4 mm) Quickon cable quick screw connection
Measured variable	Gauge pressure		
Inputs			
Measuring range			
• Gauge pressure	100 ... 600 mbar (1.5 ... 8.7 psi)		
Output			
Current signal	4 ... 20 mA	Wetted parts materials	
• Load	(U _B - 10 V)/0.02 A	• Measuring cell	Stainless steel, mat.-No. 1.4435
• Auxiliary power U _B	DC 7 ... 33 V (10 ... 30 V for Ex)	• Process connection	Stainless steel, mat. No. 1.4404 (SST 316 L)
Voltage signal	0 ... 10 V DC	• Gasket	<ul style="list-style-type: none"> FPM (Standard) Neoprene Perbunan EPDM
• Load	≥ 10 kΩ		
• Auxiliary power U _B	12 ... 33 V DC		
• Power consumption	< 7 mA at 10 kΩ	Non-wetted parts materials	
Ratiometric output	0 ... 90 %	• Enclosure	Stainless steel, mat. No. 1.4404 (SST 316 L)
• Load	≥ 10 kΩ		
• Auxiliary power U _B	5 V DC ± 10 %	• Rack	Plastic
• Power consumption	< 7 mA at 10 kΩ	• cables	PVC
Characteristic curve	Linear rising		
Measuring accuracy		Certificates and approvals	
Error in measurement at limit setting incl. hysteresis and reproducibility	<ul style="list-style-type: none"> Typical: 0.25 % of measuring span Maximum: 0.5 % of measuring span 	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)
Step response time T ₉₉	< 5 ms	Lloyd's Register of Shipping (LR) ¹⁾	12/20010
Long-term stability		Germanischer Lloyd (GL) ¹⁾	GL19740 11 HH00
• Lower range value and measuring span	0.25 % of measuring span/year	American Bureau of Shipping (ABS) ¹⁾	ABS_11_HG 789392_PDA
Influence of ambient temperature		Bureau Veritas (BV) ¹⁾	BV 271007A0 BV
• Lower range value and measuring span	<ul style="list-style-type: none"> 0.25 %/10 K of measuring span 0.5 %/10K of measuring span for a measuring range 100 ... 400 mbar 	Det Norske Veritas (DNV) ¹⁾	A 12553
• Influence of power supply	0.005 %/V	Drinking water approval (ACS) ¹⁾	ACS 15 ACC NY 360
Conditions of use		EAC ¹⁾	№ TC RU C-DE.ГБ05.В.00732 OC НАННО «ЦБВЭ»
Process temperature with gasket made of:		Underwriters Laboratories (UL) ¹⁾	
• FPM (Standard)	-15 ... +125 °C (+5 ... +257 °F)	• for USA and Canada	UL 20110217 - E34453
• Neoprene	-35 ... +100 °C (-31 ... +212 °F)	• worldwide	IEC UL DK 21845
• Perbunan	-20 ... +100 °C (-4 ... +212 °F)		
• EPDM	-40 ... +125 °C (-40 ... +257 °F), usable for drinking water	Explosion protection	
Ambient temperature	-25 ... +85 °C (-13 ... +185 °F)	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
Storage temperature	-50 ... +100 °C (-58 ... +212 °F)	EC type-examination certificate	SEV 10 ATEX 0146
Degree of protection (to EN 60529)	<ul style="list-style-type: none"> 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 	Connection to certified intrinsically-safe resistive circuits with maximum values:	U _i ≤ 30 V DC; I _i ≤ 100 mA; P _i ≤ 0.75 W
Electromagnetic compatibility	<ul style="list-style-type: none"> acc. IEC 61326-1/-2/-3 acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation ≤ 1 % 	Effective internal inductance and capacity for versions with plugs per EN 175301-803-A and M12	L _i = 0 nH; C _i = 0 nF
Mounting position	upright		

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

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P210 for gauge pressure

1

Selection and ordering data

SITRANS P 210 pressure transmitters for gauge pressure for low pressure applications

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

min.

max.

Burst pressure

For gauge pressure

0...100 mbar (1.45 psi)	-400 mbar (-5.8 psi)	400 mbar (5.8 psi)	1 bar (14.5 psi)
0...160 mbar (2.32 psi)	-400 mbar (-5.8 psi)	400 mbar (5.8 psi)	1 bar (14.5 psi)
0...250 mbar (3.63 psi)	-800 mbar (-11.6 psi)	1000 mbar (14.5 psi)	2 bar (29.0 psi)
0...400 mbar (5.8 psi)	-800 mbar (-11.6 psi)	1000 mbar (14.5 psi)	2 bar (29.0 psi)
0...600 mbar (8.7 psi)	-1000 mbar (-14.5 psi)	2000 mbar (29.0 psi)	3 bar (43.5 psi)

Other version, add Order code and plain text:

Measuring range: ... up to ... mbar (psi)

Output signal

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

0 ... 10 V; three-wire system; power supply 12 ... 33 V DC

0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC

Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC \pm 10 %

Explosion protection (only 4 ... 20 mA)

None

With explosion protection Ex ia IIC T4

Electrical connection

Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling)

Device plug M12 per IEC 61076-2-101

Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i")

Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i")

Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling)

Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling)

Fixed mounted cable, length 5 m

Special version

Process connection

G1/2" male per EN 837-1 (1/2" BSP male) (standard for metric pressure ranges mbar, bar)

G1/2" male thread and G1/8" female thread

G1/4" male per EN 837-1 (1/4" BSP male)

7/16"-20 UNF male

1/4"-18 NPT male (standard for pressure ranges inH₂O and psi)

1/4"-18 NPT female

1/2"-14 NPT male

1/2"-14 NPT female

7/16"-20 UNF female

M20x1.5 male

G1/4" to DIN 3852 Form E

G1/2" to DIN 3852 Form E

Special version

Sealing material between sensor and enclosure

Viton (FPM, standard)

Neoprene (CR)

Perbunan (NBR)

EPDM

Special version

Version

Standard version

Further designs

Supplement the Article No. with "-Z" and add Order code.

Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2

Article No.

Order code

7MF1566-

- - - - -

3AA

3AB

3AC

3AD

3AG

9AA

H1Y

0

10

20

30

0

1

1

2

0

3

0

4

5

6

0

7

9

N1Y

A

B

C

D

E

F

G

H

J

P

Q

R

Z

P1Y

A

B

C

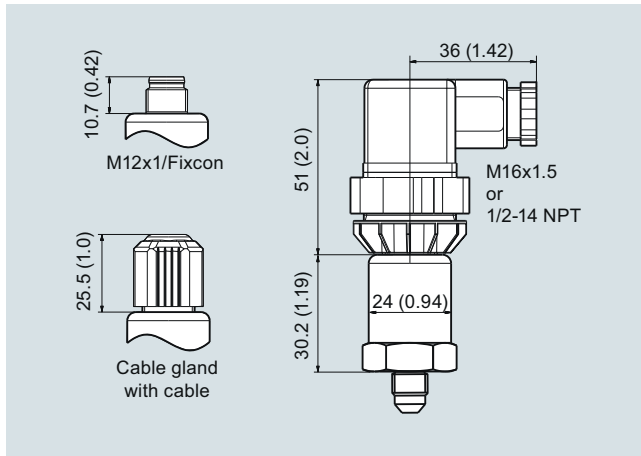
D

Z

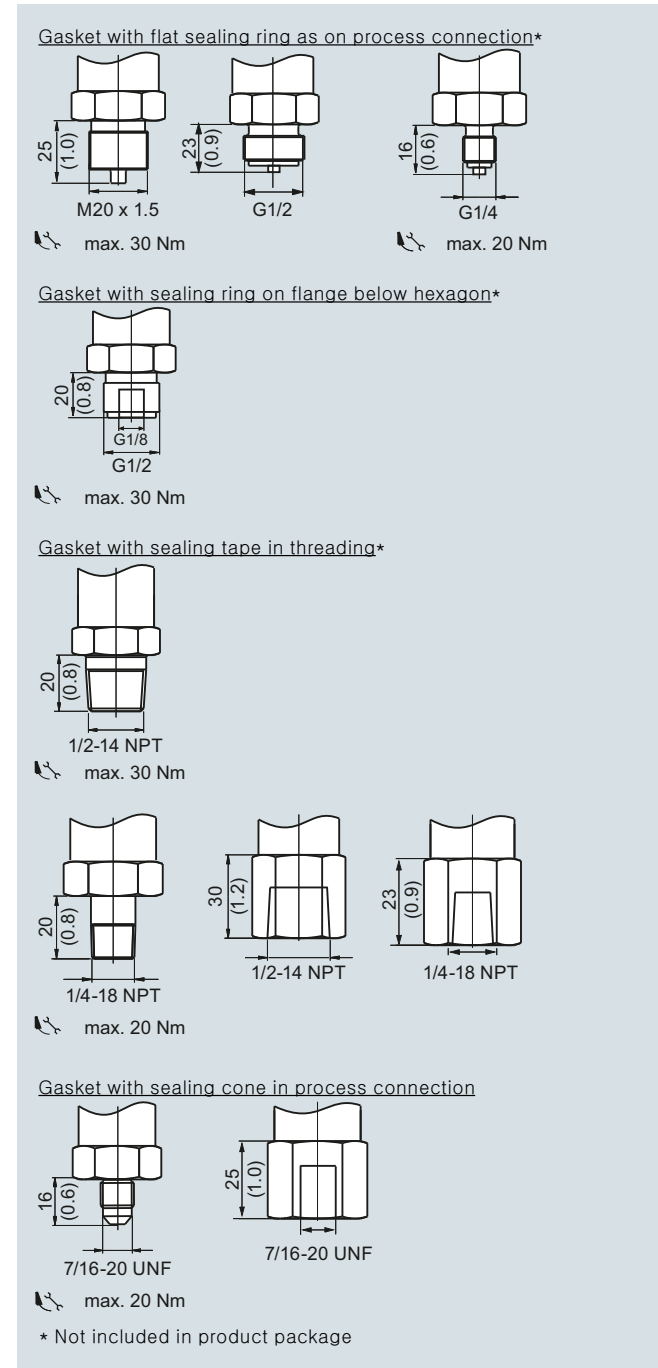
Q1Y

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C11

Dimensional drawings

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



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

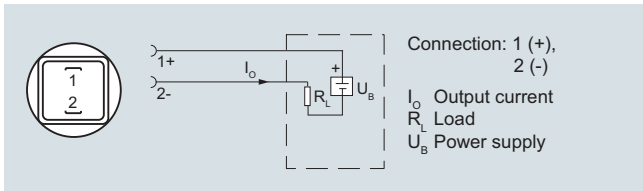
Pressure Measurement

Pressure transmitters

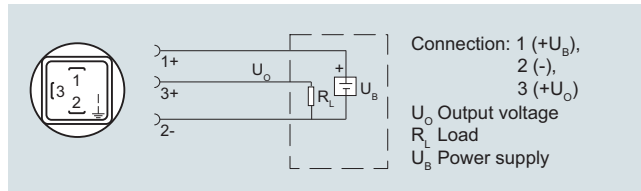
Single-range transmitters for general applications

SITRANS P210 for gauge pressure

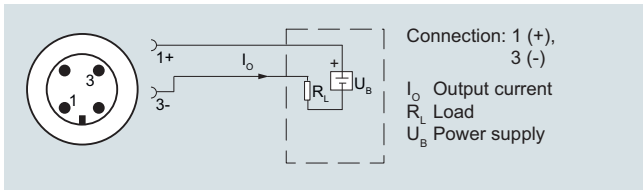
Schematics



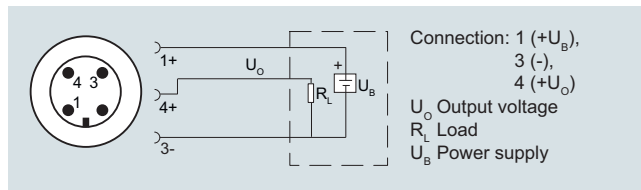
Connection with current output and connector per EN 175301



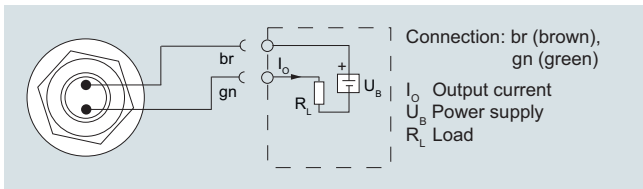
Connection with voltage output, ratiometric output and plug according to EN 175301



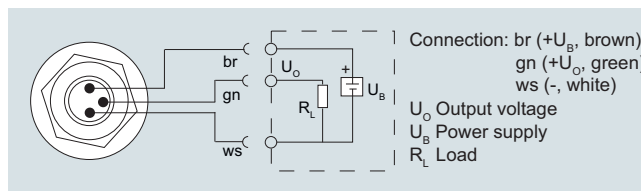
Connection with current output and device plug M12x1



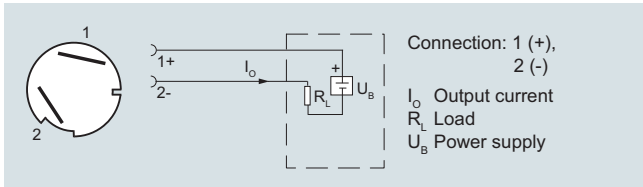
Connection with voltage output, ratiometric output and device plug M12x1



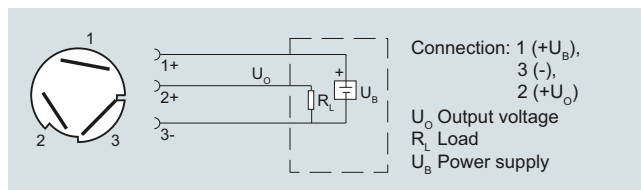
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



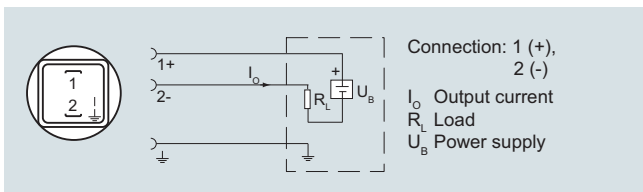
Connection with current output and Quickon cable quick screw connection



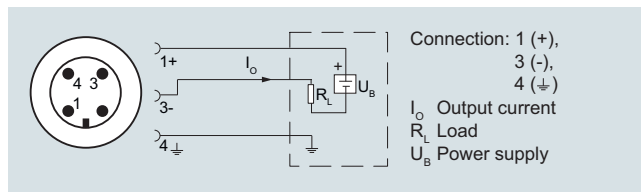
Connection with voltage output, ratiometric output and Quickon fast cable termination

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.

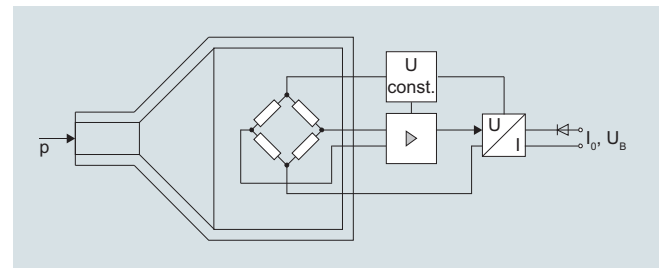
Device structure with explosion protection

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.

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P220 for gauge pressure

1

Technical specifications

Application		Design	
Gauge pressure measurement	Liquids, gases and vapors	Weight	Approx. 0.090 kg (0.198 lb)
Mode of operation		Process connections	See dimension drawings
Measuring principle	Piezoresistive measuring cell (stainless steel diaphragm)	Electrical connections	<ul style="list-style-type: none"> Connector per EN 175301-803-A Form A with cable inlet M16x1.5 or 1/2-14 NPT or Pg 11 Device plug M12 2 or 3-wire (0.5 mm²) cable (Ø ± 5.4 mm) Quickon cable quick screw connection
Measured variable	Gauge pressure		
Inputs			
Measuring range		Wetted parts materials	
<ul style="list-style-type: none"> Gauge pressure - Metric - US measuring range 	2.5 ... 1000 bar (36 ... 14500 psi) 30... 14500 psi	<ul style="list-style-type: none"> Measuring cell Process connection 	Stainless steel, mat.-No. 1.4016 Stainless steel, mat. No. 1.4404 (SST 316 L)
Output		Non-wetted parts materials	
Current signal	4 ... 20 mA	<ul style="list-style-type: none"> Enclosure 	Stainless steel, mat. No. 1.4404 (SST 316 L)
<ul style="list-style-type: none"> Load Auxiliary power U_B 	(U _B - 10 V)/0.02 A DC 7 ... 33 V (10 ... 30 V for Ex)	<ul style="list-style-type: none"> Rack cables 	Plastic PVC
Voltage signal	0 ... 10 V DC	Certificates and approvals	
<ul style="list-style-type: none"> Load Auxiliary power U_B Power consumption 	≥ 10 kΩ 12 ... 33 V DC < 7 mA at 10 kΩ	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)
Ratiometric output	0 ... 90 %	Lloyd's Register of Shipping (LR) ¹⁾	12/20010
<ul style="list-style-type: none"> Load Auxiliary power U_B Power consumption 	≥ 10 kΩ 5 V DC ± 10 % < 7 mA at 10 kΩ	Germanischer Lloyd (GL) ¹⁾	GL19740 11 HH00
Characteristic curve	Linear rising	American Bureau of Shipping (ABS) ¹⁾	ABS_11_HG 789392_PDA
Measuring accuracy		Bureau Veritas (BV) ¹⁾	BV 271007A0 BV
Error in measurement at limit setting incl. hysteresis and reproducibility	<ul style="list-style-type: none"> Typical: 0.25 % of measuring span Maximum: 0.5 % of measuring span 	Det Norske Veritas (DNV) ¹⁾	A 12553
Step response time T ₉₉	< 5 ms	Drinking water approval (ACS) ¹⁾	ACS 15 ACC NY 360
Long-term stability		EAC ¹⁾	№ TC RU C-DE.ГБ05.В.00732 ОС НАННО «ЦСВЭ»
<ul style="list-style-type: none"> Lower range value and measuring span 	0.25 % of measuring span/year	CRN ²⁾	0F18659.5C
Influence of ambient temperature		Underwriters Laboratories (UL) ¹⁾	UL 20110217 - E34453
<ul style="list-style-type: none"> Lower range value and measuring span Influence of power supply 	0.25 %/10 K of measuring span 0.005 %/V	<ul style="list-style-type: none"> for USA and Canada worldwide 	IEC UL DK 21845
Conditions of use		Explosion protection	
<ul style="list-style-type: none"> Process temperature Ambient temperature Storage temperature Degree of protection (to EN 60529) 	-40 ... +120 °C (-40 ... +248 °F) -25 ... +85 °C (-13 ... +185 °F) -50 ... +100 °C (-58 ... +212 °F)	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
		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
Electromagnetic compatibility			
	<ul style="list-style-type: none"> 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 acc. IEC 61326-1/-2/-3 acc. NAMUR NE21, only for ATEX versions and with a max. measuring deviation ≤ 1 % 		

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

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.

Article No.

Order code

Measuring range

Overload limit

Mini-
mum

Max.

Burst pressure

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)	
0 ... 4 bar	(0 ... 58 psi)	-1 bar (-14.5 psi)	10 bar (145 psi)	40 bar (870 psi)	
0 ... 6 bar	(0 ... 87 psi)	-1 bar (-14.5 psi)	15 bar (217 psi)	60 bar (522 psi)	
0 ... 10 bar	(0 ... 145 psi)	-1 bar (-14.5 psi)	25 bar (362 psi)	60 bar (870 psi)	
0 ... 16 bar	(0 ... 232 psi)	-1 bar (-14.5 psi)	40 bar (580 psi)	96 bar (1392 psi)	
0 ... 25 bar	(0 ... 363 psi)	-1 bar (-14.5 psi)	62.5 bar (906 psi)	150 bar (2176 psi)	
0 ... 40 bar	(0 ... 580 psi)	-1 bar (-14.5 psi)	100 bar (1450 psi)	240 bar (3481 psi)	
0 ... 60 bar	(0 ... 870 psi)	-1 bar (-14.5 psi)	150 bar (2175 psi)	360 bar (5221 psi)	
0 ... 100 bar	(0 ... 1450 psi)	-1 bar (-14.5 psi)	250 bar (3625 psi)	600 bar (8702 psi)	
0 ... 160 bar	(0 ... 2320 psi)	-1 bar (-14.5 psi)	400 bar (5801 psi)	960 bar (13924 psi)	
0 ... 250 bar	(0 ... 3625 psi)	-1 bar (-14.5 psi)	625 bar (9064 psi)	1500 bar (21756 psi)	
0 ... 400 bar	(0 ... 5801 psi)	-1 bar (-14.5 psi)	1000 bar (14503 psi)	2400 bar (34809 psi)	
0 ... 600 bar	(0 ... 8702 psi)	-1 bar (-14.5 psi)	1500 bar (21755 psi)	3600 bar (52200 psi)	
0 ... 1000 bar	(0 ... 14500 psi)	-1 bar (-14.5 psi)	1500 bar (21755 psi)	5000 bar (72520 psi)	

Other version, add Order code and plain text:

Measuring range: ... up to ... bar (psi)

Measuring ranges for gauge pressure

0 ... 30 psi	-14.5 psi	75 psi	360 psi	★
0 ... 60 psi	-14.5 psi	150 psi	580 psi	★
0 ... 100 psi	-14.5 psi	250 psi	580 psi	★
0 ... 150 psi	-14.5 psi	375 psi	870 psi	★
0 ... 200 psi	-14.5 psi	500 psi	1390 psi	★
0 ... 300 psi	-14.5 psi	750 psi	2170 psi	★
0 ... 500 psi	-14.5 psi	1250 psi	3481 psi	★
0 ... 750 psi	-14.5 psi	1875 psi	5220 psi	★
0 ... 1000 psi	-14.5 psi	2500 psi	5220 psi	★
0 ... 1500 psi	-14.5 psi	3750 psi	8700 psi	★
0 ... 2000 psi	-14.5 psi	5000 psi	13920 psi	★
0 ... 3000 psi	-14.5 psi	7500 psi	21750 psi	★
0 ... 5000 psi	-14.5 psi	12500 psi	34800 psi	★
0 ... 6000 psi	-14.5 psi	15000 psi	34800 psi	★
0 ... 8700 psi	-14.5 psi	21755 psi	52200 psi	★
0 ... 14500 psi	-14.5 psi	21755 psi	72520 psi	

Other version, add Order code and plain text: Measuring range: ... up to ... psi

Output signal

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

0 ... 10 V; three-wire system; power supply 12 ... 33 V DC

0 ... 5 V; 3-wire system; auxiliary power 7 ... 33 V DC

Ratiometric 10 ... 90 %; 3-wire system; auxiliary power 5 V DC ± 10 %

Explosion protection (only 4 ... 20 mA)

None

With explosion protection Ex ia IIC T4

Electrical connection

Connector per DIN EN 175301-803-A, stuffing box thread M16 (with coupling) ★

Device plug M12 per IEC 61076-2-101

Connection via fixed mounted cable, 2 m (not for type of protection "Intrinsic safety i")

Quickon cable quick screw connection PG9 (not for type of protection "Intrinsic safety i")

Connector per DIN EN 175301-803-A, stuffing box thread 1/2"-14 NPT (with coupling) ★

Connector per DIN EN 175301-803-A, stuffing box thread PG11 (with coupling) ★

Fixed mounted cable, length 5 m

Special version

★ Order code E21 required for complete configuration with CRN and cCSA_{US} Ex approval.

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

1

SITRANS P220 for gauge pressure

Selection and ordering data

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

Process connection

G½" male per EN 837-1 (½" BSP male) (standard for metric pressure ranges mbar, bar)

G½" male thread and G1/8" female thread

G¼" male per EN 837-1 (¼" BSP male)

7/16"-20 UNF male

¼"-18 NPT male (standard for pressure ranges inH₂O and psi) *

¼"-18 NPT female

½"-14 NPT male

½"-14 NPT female (Only for measuring ranges ≤ 60 bar (870 psi))

7/16"-20 UNF female

M20x1.5 male

G1/4" to DIN 3852 Form E

G1/2" to DIN 3852 Form E

Special version

Version

Standard version *

Further designs

Supplement the Article No. with "-Z" and add Order code.

Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2 (not possible for measuring ranges > 0 ... 600 bar/0 ... 8 702 psi)

Oxygen version, free of oil and degreased (not in conjunction with explosion protection version)

With CRN and cCSA_{US} Ex approval (only for measuring ranges 0 ... 30 psi bis 0 ... 8 700 psi)* Order code E21 required for complete configuration with CRN and cCSA_{US} Ex approval..

Article No.

Order code

7MF1567-

A

A
B
C
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E
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P
Q
R
Z

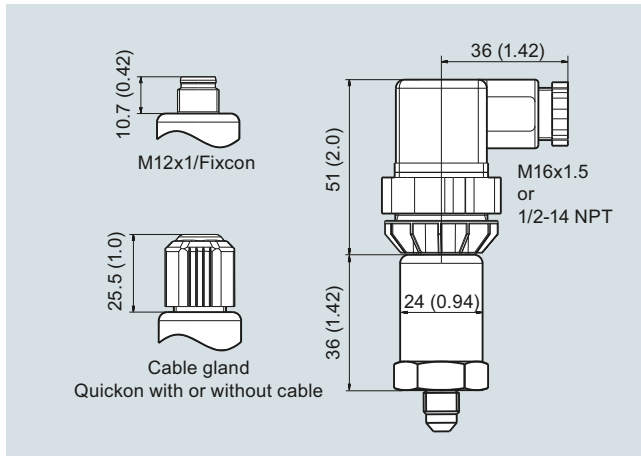
P1Y

1

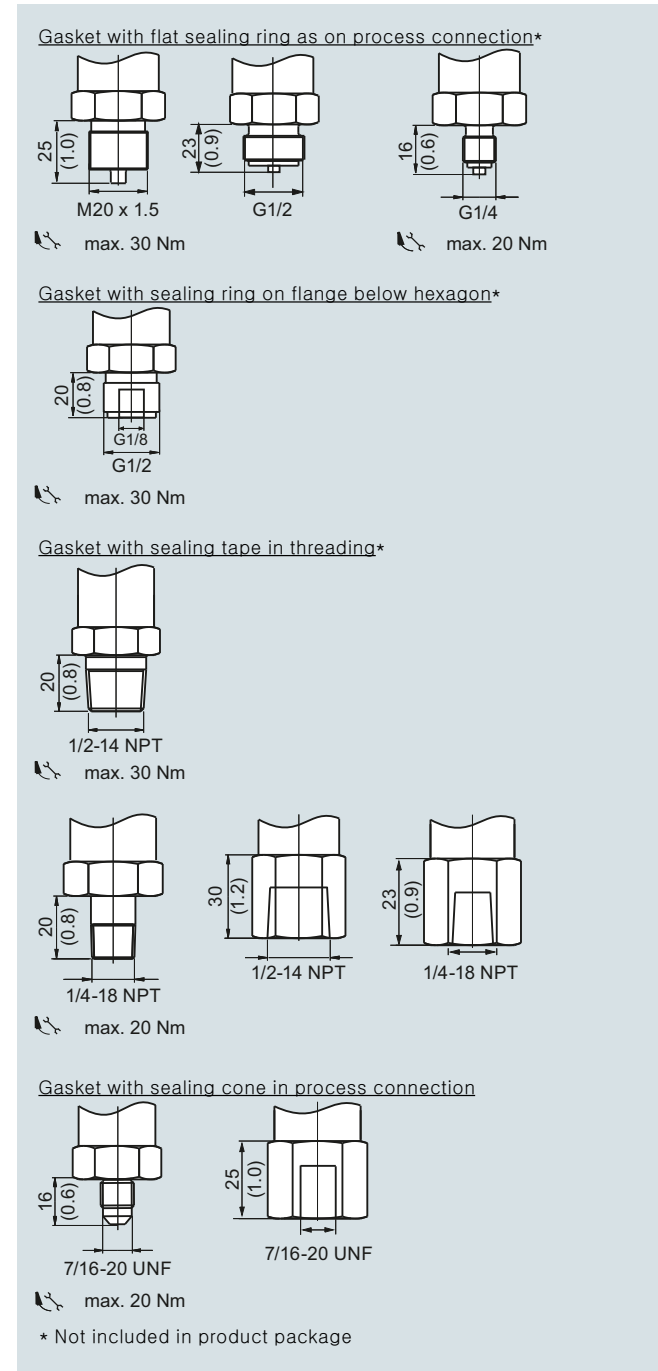
C11

E10

E21

Dimensional drawings

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



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

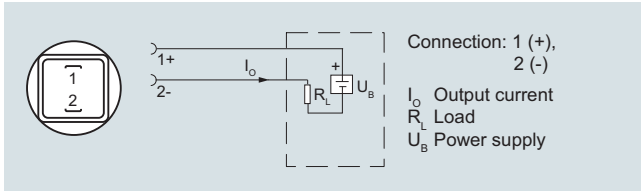
Pressure Measurement

Pressure transmitters

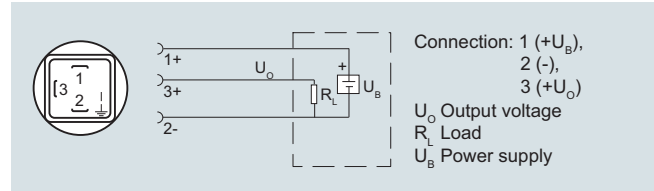
Single-range transmitters for general applications

SITRANS P220 for gauge pressure

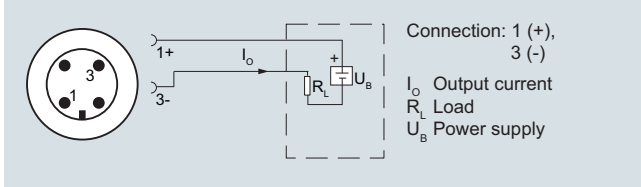
Schematics



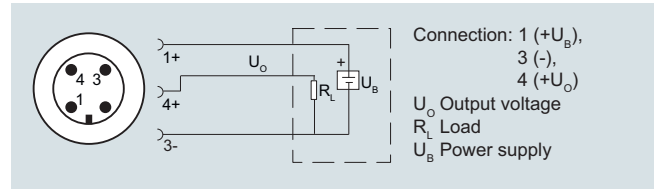
Connection with current output and connector per EN 175301



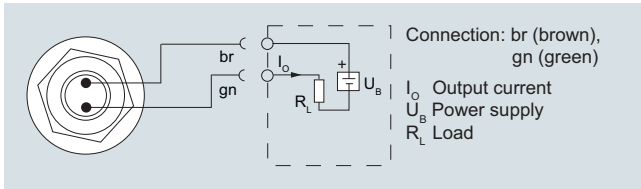
Connection with voltage output, ratiometric output and plug according to EN 175301



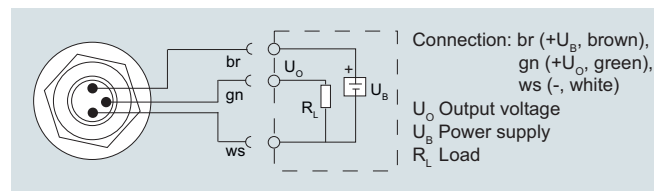
Connection with current output and device plug M12x1



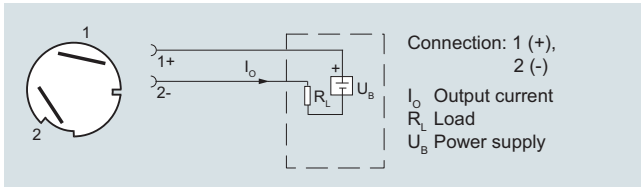
Connection with voltage output, ratiometric output and device plug M12x1



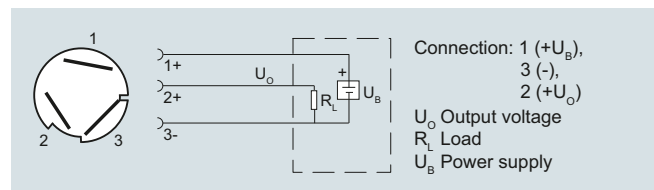
Connection with current output and cable



Connection with voltage output, ratiometric output and cable



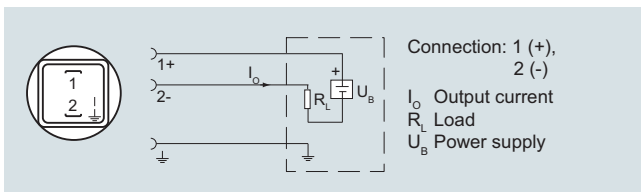
Connection with current output and cable quick screw connection Quick-on



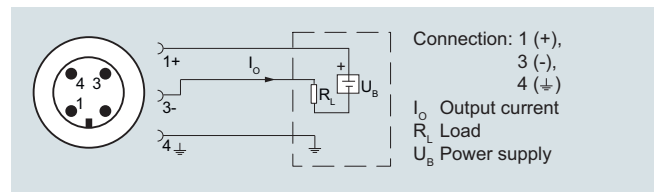
Connection with voltage output, ratiometric output and Quickon fast cable termination

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

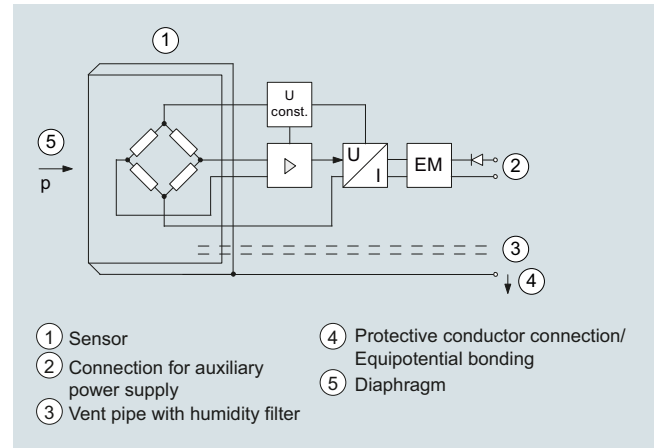
The pressure transmitter has a built-in ceramic sensor which is equipped with a Wheatstone resistance bridge.

These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel housing. 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 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 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.

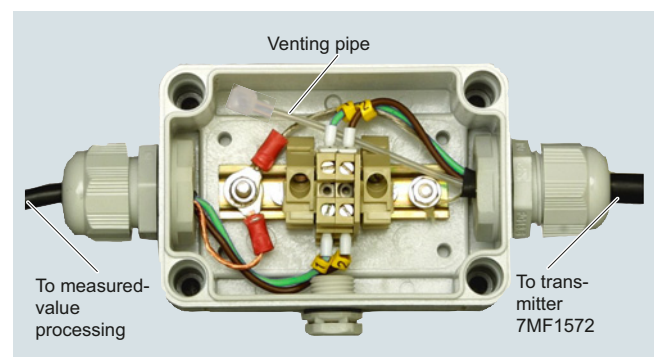
The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

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

Integration

It is generally recommended that the connecting cable of the SITRANS LH100 transmitter is connected to the junction box, which can be ordered separately, and secured with the cable hanger, 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

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

1

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 ₂ O (0 ... 9 ftH ₂ O) | • 1.5 bar (21.8 psi) (corresponds to 15 mH ₂ O (45 ftH ₂ O)) |
| • 0 ... 4 mH ₂ O (0 ... 12 ftH ₂ O) | • 1.5 bar (21.8 psi) (corresponds to 15 mH ₂ O (45 ftH ₂ O)) |
| • 0 ... 5 mH ₂ O (0 ... 15 ftH ₂ O) | • 1.5 bar (21.8 psi) (corresponds to 15 mH ₂ O (45 ftH ₂ O)) |
| • 0 ... 6 mH ₂ O (0 ... 18 ftH ₂ O) | • 1.5 bar (21.8 psi) (corresponds to 15 mH ₂ O (45 ftH ₂ O)) |
| • 0 ... 10 mH ₂ O (0 ... 30 ftH ₂ O) | • 3.0 bar (43.5 psi) (corresponds to 30 mH ₂ O (90 ftH ₂ O)) |
| • 0 ... 20 mH ₂ O (0 ... 60 ftH ₂ O) | • 5.0 bar (72.5 psi) (corresponds to 50 mH ₂ O (150 ftH ₂ O)) |
| • 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 full-scale value (typical)

Measuring range

- | | |
|---|---|
| • 0 ... 3 mH ₂ O (0 ... 9 ftH ₂ O bzw. 0 ... 0.3 bar) | 0.5 % of full-scale value (typical)
1.0% of full-scale value (maximum) |
| • For all other measuring ranges | 0.3 % of full-scale value (typical)
0.6% of full-scale value (maximum) |

Influence of ambient temperature

Measuring range

- | | |
|---|---|
| • 3 mH ₂ O (9 ftH ₂ O or 0.3 bar) | Zero and span
0.5 %/10 K of full-scale value |
| • 4 ... 6 mH ₂ O (12 ... 18 ftH ₂ O or 0.4...0.6 bar) | 0.45 %/10 K of full-scale value |
| • > 6 mH ₂ O (> 18 ftH ₂ O or > 0.6 bar) | 0.3 %/10 K of full-scale value |

Long-term stability

Measuring range

- | | |
|---|---|
| • 3 mH ₂ O (9 ftH ₂ O or 0.3 bar) | Zero and span
0.4 % of full-scale value/year |
| • 4 ... 6 mH ₂ O (12 ... 18 ftH ₂ O or 0.4...0.6 bar) | 0.25% of full-scale value/year |
| • > 6 mH ₂ O (> 18 ftH ₂ O or > 0.6 bar) | 0.2 % of full-scale value/year |

Rated 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 |

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS LH100 Transmitter for hydrostatic level

1

Design	
Weight	≈ 0.2 kg (≈ 0.44 lb)
• Pressure transmitter	0.025 kg/m (≈ 0.015 lb/ft)
• Cable; maximum cable length 100 m (330 ft)	
Electrical connection	Cable with 3 conductors, vent pipe and integrated humidity filter
Material	
• Seal diaphragm	Al ₂ O 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	№ TC RU C-DE.ГБ05.B.00732 ОС НАННО «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 pipe for atmospheric pressure	
Rated 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

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

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 Al₂O₃ 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 ₂ O ¹⁾	10 m
0 ... 4 mH ₂ O	10 m
0 ... 5 mH ₂ O	10 m
0 ... 6 mH ₂ O	10 m
0 ... 10 mH ₂ O	20 m
0 ... 20 mH ₂ O	30 m
0 ... 9 ftH ₂ O ¹⁾	33 ft
0 ... 12 ftH ₂ O	33 ft
0 ... 15 ftH ₂ O	33 ft
0 ... 18 ftH ₂ O	33 ft
0 ... 30 ftH ₂ O	66 ft
0 ... 60 ftH ₂ O	98 ft
0 ... 0.3 bar ¹⁾	10 m
0 ... 0.4 bar	10 m
0 ... 0.5 bar	10 m
0 ... 0.6 bar	10 m
0 ... 1 bar	20 m
0 ... 2 bar	30 m

1 C
1 D
1 E
1 F
1 H
1 K
2 C
2 D
2 E
2 F
2 H
2 K
3 C
3 D
3 E
3 F
3 H
3 K

Special versions:

Measuring ranges for special versions between

0 ... 3 mH₂O and 0 ... 30 mH₂O or

0 ... 9 ftH₂O and 0 ... 100 ftH₂O or

0 ... 0.3 bar and 0 ... 3 bar possible.

Special cable length/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.

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)

5 m (16 ft)

7 m (23 ft)

10 m (33 ft)

15 m (49 ft)

20 m (66 ft)

25 m (82 ft)

30 m (98 ft)

40 m (131 ft)

50 m (164 ft)

60 m (198 ft)¹⁾

70 m (231 ft)¹⁾

80 m (264 ft)¹⁾

90 m (297 ft)¹⁾

100 m (330 ft)¹⁾

H 1 A
H 1 B
H 1 C
H 1 D
H 1 E
H 1 F
H 1 G
H 1 H
H 1 J
H 1 K
H 1 L
H 1 M
H 1 N
H 1 P
H 1 Q

9 A

H . .
+
Y 0 1

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 Al₂O₃ ceramic, with permanently mounted PE cable

Sealing material between sensor and enclosure

- FPM (Standard)
- EPDM (for drinking water applications)

1
2

Explosion protection

- without
- With ATEX II 1 G Ex ia IIC T4 Ga and IECEx Ex ia IIC T4 Ga

0
1

Additional versions

Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2, add "-Z" to article no. and add order code.

Indication of measuring range (only at special cable lengths) in "..." to ... mH₂O" or "..." to ... ftH₂O" or "..." to ... bar"

Order code

C11

Y01

Accessories/spare parts

Junction box

for connecting the transmitter cable

Article No.

7MF1572-8AA

Cable hanger

for securing the pressure transmitter

7MF1572-8AB

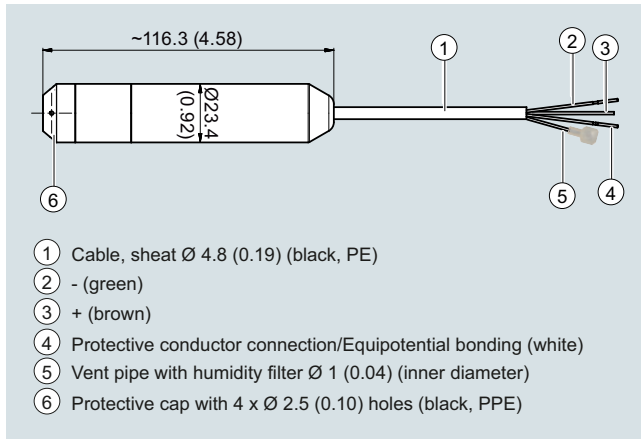
Protective caps as spare parts (10-pack)

7MF1572-8AD

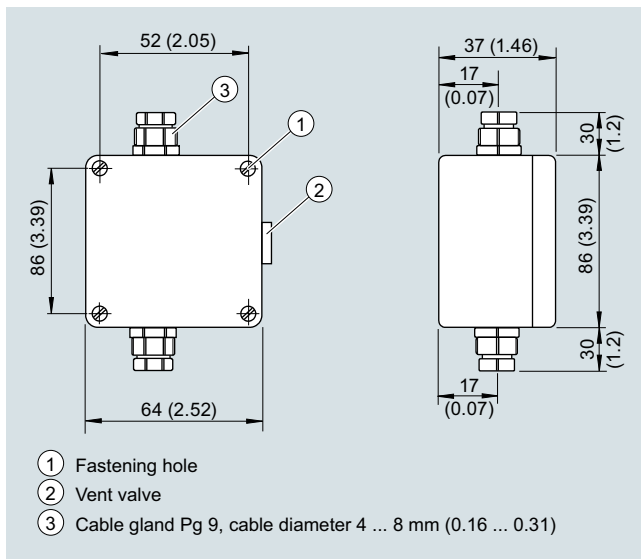
Humidity filters as spare parts (10-pack)

7MF1572-8AE

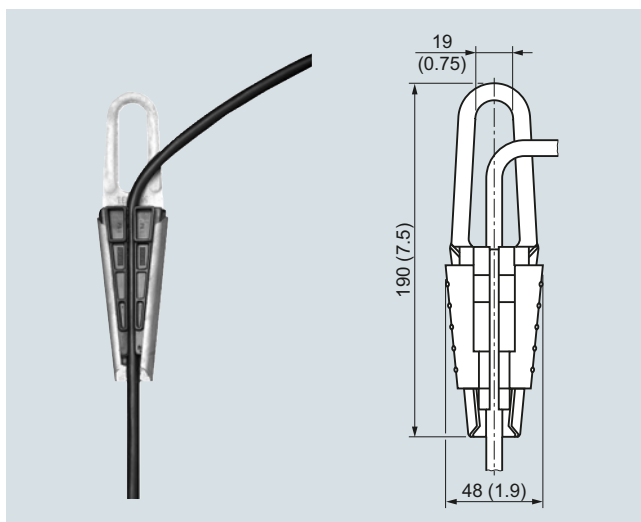
¹⁾ Approvals pending.

Dimensional drawings

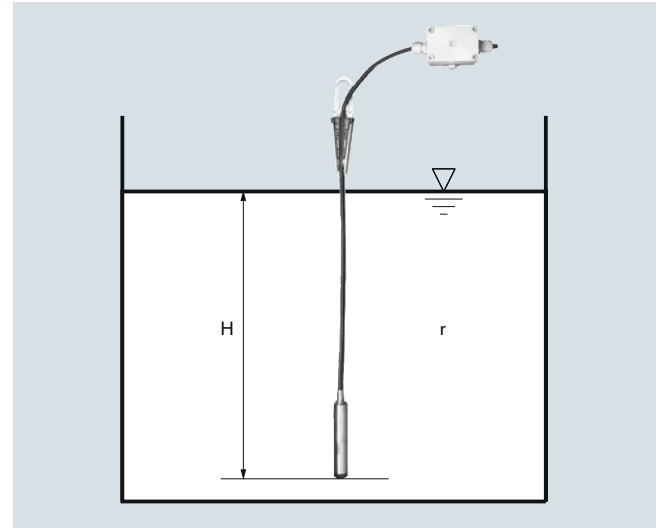
SITRANS LH100 pressure transmitter, dimensions in mm (inch)



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:

$$p = \rho \times g \times H$$

with:

 ρ = density of medium g = local acceleration due to gravity H = maximum levelExample:Medium: Water, $\rho = 1\,000 \text{ kg/m}^3$ Acceleration due to gravity: 9.81 m/s^2

Start-of-scale: 0 m

Maximum level: 6.0 m

Cable length: 10 m

Calculation:

$$p = 1\,000 \text{ kg/m}^3 \times 9.81 \text{ m/s}^2 \times 6.0 \text{ m}$$

$$p = 58\,860 \text{ N/m}^2$$

$$p = 589 \text{ mbar}$$

Transmitter to be ordered:

7MF1572-1FA10

Plus, if required, junction box 7MF1572-8AA and cable hanger 7MF1572-8AB

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

1

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.

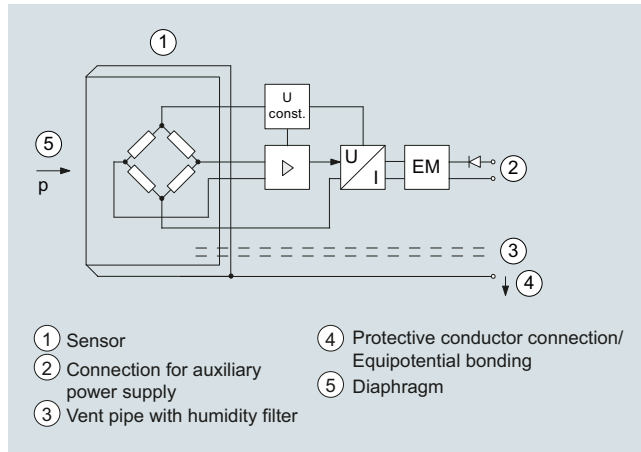
These pressure transmitters are equipped with an electronic circuit fitted together with the sensor in a stainless steel housing. In addition, the connecting cable contains a vent pipe which is equipped with a humidity filter to prevent the build-up of condensation.

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.

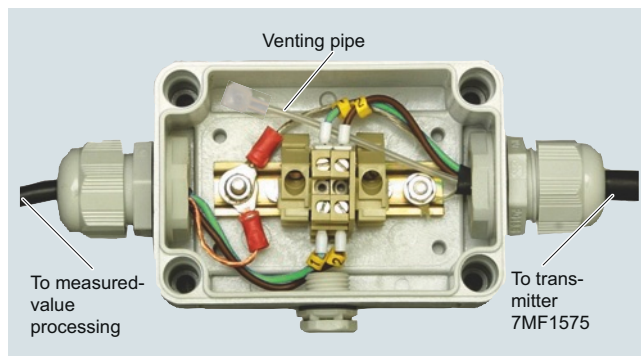
The output voltage of the sensor is applied to the electronic circuit where it is converted into an output current of 4 to 20 mA.

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 junction box, which can be ordered separately, and secured with the cable hanger, also available separately. The junction box has to be installed near the measuring point, but outside the media.

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



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
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Input

Measured variable	Hydrostatic level
Measuring range	Max. permissible operating pressure
• 0 ... 1 mH ₂ O (0 ... 3 ftH ₂ O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH ₂ O (45 ftH ₂ O))
• 0 ... 2 mH ₂ O (0 ... 6 ftH ₂ O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH ₂ O (45 ftH ₂ O))
• 0 ... 3 mH ₂ O (0 ... 9 ftH ₂ O)	• 1.5 bar (21.8 psi) (corresponds to 15 mH ₂ O (45 ftH ₂ O))
• 0 ... 4 mH ₂ O (0 ... 12 ftH ₂ O)	• 2 bar (29 psi) (corresponds to 20 mH ₂ O (60 ftH ₂ O))
• 0 ... 5 mH ₂ O (0 ... 15 ftH ₂ O)	• 2 bar (29 psi) (corresponds to 20 mH ₂ O (60 ftH ₂ O))
• 0 ... 6 mH ₂ O (0 ... 18 ftH ₂ O)	• 2 bar (29 psi) (corresponds to 20 mH ₂ O (60 ftH ₂ O))
• 0 ... 10 mH ₂ O (0 ... 30 ftH ₂ O)	• 5 bar (72.5 psi) (corresponds to 50 mH ₂ O (150 ftH ₂ O))
• 0 ... 20 mH ₂ O (0 ... 60 ftH ₂ O)	• 10 bar (145 psi) (corresponds to 100 mH ₂ O (300 ftH ₂ O))
• 0 ... 40 mH ₂ O (0 ... 120 ftH ₂ O)	• 20 bar (290 psi) (corresponds to 200 mH ₂ O (600 ftH ₂ O))
Special measuring ranges	
• Up to 100 mH ₂ O (300 ftH ₂ O)	• 20 bar (290 psi) (corresponds to 200 mH ₂ O (600 ftH ₂ O))
• Up to 160 mH ₂ O (480 ftH ₂ O)	• 24 bar (348 psi) (corresponds to 240 mH ₂ O (720 ftH ₂ O))

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
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Measuring accuracy

According to IEC 60770-1	
Error in measurement at limit setting including hysteresis and reproducibility	≤ 0.15 % of full-scale value (typical) ≤ 0.3 % of full-scale value (maximum)
Influence of ambient temperature	≤ 0.05 %/10 K of full-scale value (zero and span)
Long-term stability	≤ 0.15 % of full-scale value/year (zero and span)

Rated 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

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

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SITRANS LH300 Transmitter for hydrostatic level

Design

Weight	≈ 0.4 kg (≈ 0.88 lb)
• Pressure transmitter	0.08 kg/m (≈ 0.059 lb/ft)
• Cable	
Maximal freely suspended length	300 m (990 ft)
Electrical connection	Cable with 2 conductors, vent pipe and integrated humidity filters
Material	
• Seal diaphragm	Al ₂ O ₃ ceramic, 99.6 %
• Enclosure	Stainless steel, mat. no. 1.4404/316L and 1.4539/904L (sea water applications) respectively
	FPM (standard)
• Gasket	EPDM (optional)
	PE (standard/drinking water applications)
• Connecting cable	FEP (for aggressive media)
	Stainless steel, PPE or ETFE
• Cap	

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.ГA02.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 pipe for atmospheric pressure	
Rated 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

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS LH300 Transmitter for hydrostatic level

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Selection and ordering data		Article No.	Order code	Selection and ordering data		Article No.	Order code
Pressure transmitter SITRANS LH300 (submersible sensor)		7MF1575-		Pressure transmitter SITRANS LH300 (submersible sensor)		7MF1575-	
For hydrostatic level measurement, submersible transmitter, two-wire connection, 4 ... 20 mA, body material see Order option, measuring cell Al ₂ O 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.				PE cable for general purpose and drinking water applications			
➤ Click on the Article No. for the online configuration in the PLM Life Cycle Portal.				Special cable length Please add „Z“ to Article No. and specify Order code and plain text: Y01: Cable length		9 X	H . . + Y 0 1
Measuring range				3 m (≈ 10 ft)			H 1 A
Cable length (PE cable)				5 m (≈ 16 ft)			H 1 B
0 ... 1 mH ₂ O	5 m	1 A		7 m (≈ 23 ft)			H 1 C
0 ... 2 mH ₂ O	5 m	1 B		10 m (≈ 33 ft)			H 1 D
0 ... 3 mH ₂ O	10 m	1 C		15 m (≈ 50 ft)			H 1 E
0 ... 4 mH ₂ O	10 m	1 D		20 m (≈ 65 ft)			H 1 F
0 ... 5 mH ₂ O	10 m	1 E		25 m (≈ 80 ft)			H 1 G
0 ... 6 mH ₂ O	10 m	1 F		30 m (≈ 100 ft)			H 1 H
0 ... 10 mH ₂ O	20 m	1 H		40 m (≈ 130 ft)			H 1 J
0 ... 20 mH ₂ O	30 m	1 K		50 m (≈ 160 ft)			H 1 K
0 ... 40 mH ₂ O	50 m	1 L		60 m (≈ 200 ft)			H 1 L
0 ... 3 ftH ₂ O	5 m (≈ 15 ft)	2 A		70 m (≈ 230 ft)			H 1 M
0 ... 6 ftH ₂ O	5 m (≈ 15 ft)	2 B		80 m (≈ 265 ft)			H 1 N
0 ... 9 ftH ₂ O	10 m (≈ 30 ft)	2 C		90 m (≈ 295 ft)			H 1 P
0 ... 12 ftH ₂ O	10 m (≈ 30 ft)	2 D		100 m (≈ 330 ft)			H 1 Q
0 ... 15 ftH ₂ O	10 m (≈ 30 ft)	2 E		125 m (≈ 410 ft)			H 1 R
0 ... 18 ftH ₂ O	10 m (≈ 30 ft)	2 F		150 m (≈ 495 ft)			H 1 S
0 ... 30 ftH ₂ O	20 m (≈ 60 ft)	2 H		175 m (≈ 575 ft)			H 1 T
0 ... 60 ftH ₂ O	30 m (≈ 90 ft)	2 K		200 m (≈ 650 ft)			H 1 U
0 ... 120 ftH ₂ O	50 m (≈ 150 ft)	2 L		225 m (≈ 740 ft)			H 1 V
0 ... 0.1 bar	5 m	3 A		250 m (≈ 820 ft)			H 1 W
0 ... 0.2 bar	5 m	3 B		275 m (≈ 900 ft)			H 1 X
0 ... 0.3 bar	10 m	3 C		300 m (≈ 990 ft)			H 2 A
0 ... 0.4 bar	10 m	3 D		350 m (≈ 1150 ft)			H 2 B
0 ... 0.5 bar	10 m	3 E		400 m (≈ 1320 ft)			H 2 C
0 ... 0.6 bar	10 m	3 F		450 m (≈ 1480 ft)			H 2 D
0 ... 1 bar	20 m	3 H		500 m (≈ 1650 ft)			H 2 E
0 ... 2 bar	30 m	3 K		550 m (≈ 1815 ft)			H 2 F
0 ... 4 bar	50 m	3 L		600 m (≈ 1980 ft)			H 2 G
Special versions:				650 m (≈ 2145 ft)			H 2 H
<u>Measuring ranges</u> for special versions between				700 m (≈ 2310 ft)			H 2 J
0 ... 1 mH ₂ O and 0 ... 160 mH ₂ O or				750 m (≈ 2475 ft)			H 2 K
0 ... 3 ftH ₂ O and 0 ... 530 ftH ₂ O or				800 m (≈ 2640 ft)			H 2 L
0 ... 0.1 bar and 0 ... 16 bar possible.				850 m (≈ 2800 ft)			H 2 M
				900 m (≈ 2970 ft)			H 2 N
				950 m (≈ 3135 ft)			H 2 P
				1000 m (≈ 3300 ft)			H 2 Q
				Other special cable length Please add „Z“ to Article No. and specify Order codes and plain text: H1Y: Cable length		9 X	H 1 Y + Y 0 1
				Y01: Measuring range			

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

1

SITRANS LH300 Transmitter for hydrostatic level

Selection and ordering data	Article No.	Order code	Selection and ordering data	Article No.	Order code
Pressure transmitter SITRANS LH300 (submersible sensor)	7MF1575-		Pressure transmitter SITRANS LH300 (submersible sensor)	7MF1575-	
FEP cable for aggressive media			Material of housing		
Special cable length Please add „Z“ to Article No. and specify Order code and plain text: Y01: Cable length	9 X	H . . + Y 0 1	Stainless steel 316L (1.4404)	Material of protective cap	
3 m (≈ 10 ft)		H 5 A	Stainless steel 316L (1.4404)	Protective capability made of PPE (recom- mended for PE cable)	A
5 m (≈ 16 ft)		H 5 B	Stainless steel 316L (1.4404)	Protective cap made of ETFE (standard with FEP cable)	B
7 m (≈ 23 ft)		H 5 C	Stainless steel 316L (1.4404)	Stainless steel 316L (1.4404)	C
10 m (≈ 33 ft)		H 5 D	Stainless steel 904L (1.4539) for sea water applications	Protective cap PPE	D
15 m (≈ 50 ft)		H 5 E	Stainless steel 904L (1.4539) for sea water applications	Protective cap ETFE	E
20 m (≈ 65 ft)		H 5 F	Stainless steel 904L (1.4539) for seawater applications	Stainless steel 904L (1.4539) for seawater applications	F
25 m (≈ 80 ft)		H 5 G			
30 m (≈ 100 ft)		H 5 H			
40 m (≈ 130 ft)		H 5 J			
50 m (≈ 160 ft)		H 5 K			
60 m (≈ 200 ft)		H 5 L			
70 m (≈ 230 ft)		H 5 M			
80 m (≈ 265 ft)		H 5 N			
90 m (≈ 295 ft)		H 5 P			
100 m (≈ 330 ft)		H 5 Q			
125 m (≈ 410 ft)		H 5 R			
150 m (≈ 495 ft)		H 5 S			
175 m (≈ 575 ft)		H 5 T			
200 m (≈ 650 ft)		H 5 U			
225 m (≈ 740 ft)		H 5 V			
250 m (≈ 820 ft)		H 5 W			
275 m (≈ 900 ft)		H 5 X			
300 m (≈ 990 ft)		H 6 A			
350 m (≈ 1150 ft)		H 6 B			
400 m (≈ 1320 ft)		H 6 C			
450 m (≈ 1480 ft)		H 6 D			
500 m (≈ 1650 ft)		H 6 E			
550 m (≈ 1815 ft)		H 6 F			
600 m (≈ 1980 ft)		H 6 G			
650 m (≈ 2145 ft)		H 6 H			
700 m (≈ 2310 ft)		H 6 J			
750 m (≈ 2475 ft)		H 6 K			
800 m (≈ 2640 ft)		H 6 L			
850 m (≈ 2800 ft)		H 6 M			
900 m (≈ 2970 ft)		H 6 N			
950 m (≈ 3135 ft)		H 6 P			
1000 m (≈ 3300 ft)		H 6 Q			
Other special cable length Please add „Z“ to Article No. and specify Order codes and plain text: H1Y: Cable length	9 X	H 5 Y + Y 0 1			
Y01: Measuring range					
			Sealing material between sensor and housing		
			FPM (Standard)	1	
			EPDM (for drinking water)	2	
			Explosion protection		
			without	0	
			With ATEX II 1 G Ex ia IIC T4 Ga, IECEx Ex ia IIC T4 Ga and EAC Ex (only pos- sible for cable length ≤ 300 m (990 ft))	1	
			Additional versions	Order code	
			Quality Inspection Certificate (factory calibra- tion) to IEC 60770-2 (6 points upward)	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	

Pressure Measurement

Pressure transmitters

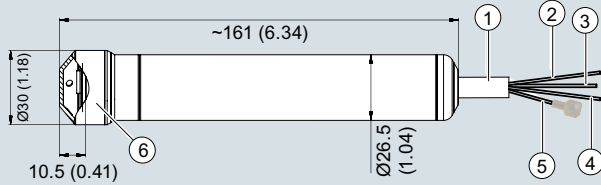
Single-range transmitters for general applications

SITRANS LH300 Transmitter for hydrostatic level

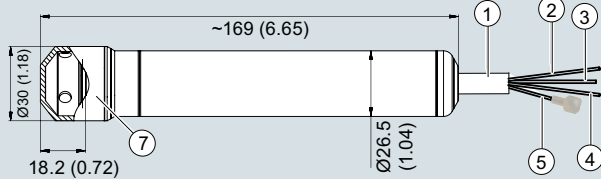
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Dimensional drawings

Sensor with protective cap (PPE, ETFE)

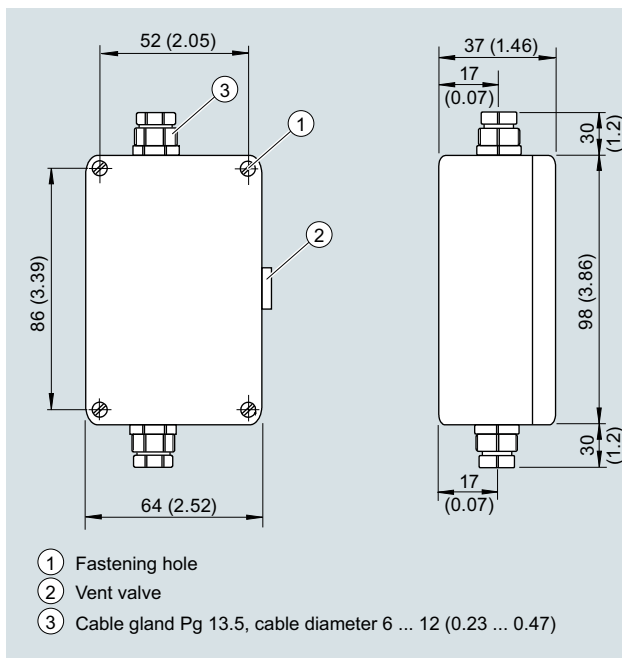


Sensor with protective cap (stainless steel)



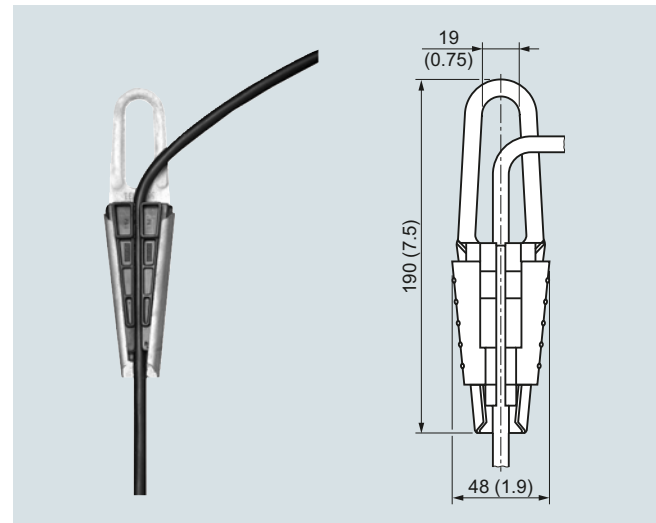
- ① Cable, sheath Ø 8.3 (0.33)
- ② - (blue)
- ③ + (brown)
- ④ Protective conductor connection/Equipotential bonding (black)
- ⑤ Vent pipe with humidity filter Ø 1 (0.04) (inner diameter)
- ⑥ Protective cap (PPE or PTFE) with 4 x Ø 2.5 (0.10) holes
- ⑦ Protective cap (stainless steel) with 4 x Ø 5 (0.20)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

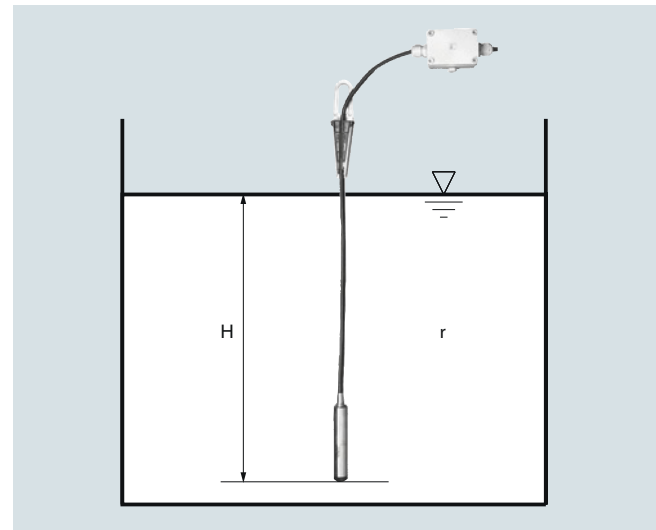
Junction box, dimensions in mm (inch)



Cable hanger, dimensions in mm (inch)

More information

Determination of the measuring range for medium water



Calculation of the measuring range:

$$p = \rho \times g \times H$$

with:

 ρ = density of medium g = local acceleration due to gravity H = maximum level

Example:

Medium: Water, $\rho = 1\,000\text{ kg/m}^3$ Acceleration due to gravity: 9.81 m/s^2

Start-of-scale: 0 m

Maximum level: 6.0 m

Cable length: 10 m

Calculation:

$$p = 1\,000\text{ kg/m}^3 \times 9.81\text{ m/s}^2 \times 6.0\text{ m}$$

$$p = 58\,860\text{ N/m}^2$$

$$p = 589\text{ mbar}$$

Transmitter to be ordered:

7MF1575-1FA10

Plus, if required, junction box 7MF1575-8AA and cable hanger 7MF1575-8AB

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

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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 housing 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 full-scale 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 housing 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 housings 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 housing

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
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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	$\leq 0.2\%$ of full-scale value
Adjustment accuracy	$\leq \pm 0.2\%$ of full-scale value
Step response time	< 20 ms
<u>Influence of ambient temperature</u>	
On the enclosure	
• Zero point	< 0.2 %/10 K of full-scale value
• Measuring span	< 0.2 %/10 K of full-scale 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)
• Clamp-on 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.

Rated 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	<ul style="list-style-type: none"> • Field housing 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 housing 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 clamp-on 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

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

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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 diaphragm flush at front	7MF8010 -	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of full-scale 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 (Tuchenhausen)		
• D = 50, for Varivent housing DN 25 and 1 inch	KF	
• D = 68, for Varivent housing DN 40 ... DN 125 and 1½ ... 6 inch	KL	
Special version (add Order code and plain text)	ZA	J 1 Y
Filling liquid		
Food oil, FDA-listed	3	
Special version (add Order code and plain text)	9	L 1 Y
Output signal		
4 ... 20 mA	1	
Special version (add Order code and plain text)	9	M 1 Y

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 full-scale 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	J 1 Y
Filling liquid		
Food oil, FDA-listed	3	
Special version (add Order code and plain text)	9	L 1 Y
Output signal		
4 ... 20 mA	1	
Special version (add Order code and plain text)	9	M 1 Y

¹⁾ Please specify as well:

Connections for pipes: R01, R02 or R03, see table "Further designs" on next page

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P Compact for gauge and absolute pressure

1

Selection and Ordering data		Article No.	Ord. code	Selection and Ordering data		Article No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with diaphragm flush at front		7MF8010-		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 full-scale value Output 4 ... 20 mA		1		2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of full-scale value Output 4 ... 20 mA		1	
Housing design (stainless steel mat. No. 1.4404/316L) / electr. connection				Measured range			
Housing with angled plug to DIN 43650, IP65		1		Overload pressure			
Housing with device plug M12, IP65, union nut made of polyamide		2		(continued)			
Housing with device plug M12, IP65, union nut made of stainless steel		3		-1 ... +9 bar (-14.5 ... +130.5 psi)	60 bar (870 psi)	GA	
Stainless steel field housing (small) with cable gland, IP65		4		-1 ... +15 bar (-14.5 ... +217.6 psi)	60 bar (870 psi)	GB	
Stainless steel field housing (small) with cable gland, IP67		5		0 ... 1 bar a (0 ... 14.5 psi a)	3 bar a (43.5 psi a)	HA	
Internal ventilation for measuring ranges < 16 bar (< 232 psi)				0 ... 1.6 bar a (0 ... 23.2 psi a)	10 bar (145 psi)	HB	
Measured range				0 ... 2.5 bar a (0 ... 36.3 psi a)	10 bar a (145 psi a)	HC	
0 ... 160 mbar (0 ... 2.32 psi)	1 bar (14.5 psi)	BB		0 ... 4 bar a (0 ... 58 psi a)	10 bar a (145 psi a)	HD	
0 ... 250 mbar (0 ... 3.63 psi)	1 bar (14.5 psi)	BC		0 ... 6 bar a (0 ... 87 psi a)	60 bar a (870 psi a)	HE	
0 ... 400 mbar (0 ... 5.8 psi)	3 bar (43.5 psi)	BD		0 ... 10 bar a (0 ... 145 psi a)	60 bar a (870 psi a)	JA	
0 ... 600 mbar (0 ... 8.7 psi)	3 bar (43.5 psi)	BE		Special version (add Order code and plain text)		ZA	P1Y
0 ... 1 bar (0 ... 14.5 psi)	3 bar (43.5 psi)	CA		Explosion protection			
0 ... 1.6 bar (0 ... 23.2 psi)	10 bar (145 psi)	CB		without			1
0 ... 2.5 bar (0 ... 36.3 psi)	10 bar (145 psi)	CC		with, to ATEX 100a, II 2 G, Ex ib IIC T6			2
0 ... 4 bar (0 ... 58 psi)	20 bar (290 psi)	CD		Further designs		Order code	
0 ... 6 bar (0 ... 87 psi)	60 bar (870 psi)	CE		Please add "-Z" to Article No. and specify Order code			
0 ... 10 bar (0 ... 145 psi)	60 bar (870 psi)	DA		Hygiene version		P01	
0 ... 16 bar (0 ... 232 psi)	60 bar (870 psi)	DB		Roughness of process connection: Foil $R_a < 0.8 \mu\text{m}$ ($3.15 \cdot 10^{-8}$ inch); Welded seams $R_a < 1.5 \mu\text{m}$ ($5.9 \cdot 10^{-8}$ inch)			
0 ... 25 bar (0 ... 363 psi)	60 bar (870 psi)	DC		Integral cooling element		K01	
0 ... 40 bar (0 ... 580 psi)	100 bar (1450 psi)	DD		Process temperature max. 200 °C (392 °F) instead of 140 °C (284 °F)			
-160 ... 0 mbar (-2.32 ... 0 psi)	1 bar (14.5 psi)	EB		Connections for pipe			
-250 ... 0 bar (-3.73 ... 0 psi)	1 bar (14.5 psi)	EC		Pipes to DIN 11850		R01	
-400 ... 0 bar (-5.8 ... 0 psi)	3 bar (43.5 psi)	ED		ISO pipes to DIN 2463		R02	
-600 ... 0 bar (-8.7 ... 0 psi)	3 bar (43.5 psi)	EE		Pipes to O. D. Tubing "BS 4825 Part 1"		R03	
-1 ... 0 bar (-14.5 ... 0 psi)	3 bar (43.5 psi)	FA		Certificates			
-1 ... 0.6 bar (-14.5 ... 8.7 psi)	10 bar (145 psi)	FB		Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2		C11	
-1 ... 1.5 bar (-14.5 ... 21.8 psi)	10 bar (145 psi)	FC		Inspection certificate to EN 10204-3.1		C12	
-1 ... 3 bar (-14.5 ... 43.5 psi)	20 bar (290 psi)	FD		Use of FDA-listed remote seal filling liquids certified by test report to EN 10204-2.2		C17	
-1 ... 5 bar (-14.5 ... 72.5 psi)	20 bar (290 psi)	FE		Roughness depth measurement R_a certified by test report to EN 10204-3.1		C18	
				Certification to EHEDG for clamp-on seals with aseptic screwed gland to DIN 11864		C19	

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P Compact for gauge and absolute pressure

1

Selection and Ordering data	Article No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with clamp-on remote seal	7MF8010 -	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of full-scale value Output 4 ... 20 mA	2	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Clamp-on remote 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	J 1 Y
Filling liquid		
Food oil, FDA-listed	3	
Special version (add Order code and plain text)	9	L 1 Y
Output signal		
4 ... 20 mA	1	
Special version (add Order code and plain text)	9	M 1 Y

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 clamp-on remote seal	7MF8010 -	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of full-scale value Output 4 ... 20 mA	2	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Clamp-on 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	J 1 Y
Filling liquid		
Food oil, FDA-listed	3	
Medicinal white oil	2	
Special version (add Order code and plain text)	9	L 1 Y
Output signal		
4 ... 20 mA	1	
Special version (add Order code and plain text)	9	M 1 Y

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

Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P Compact for gauge and absolute pressure

1

Selection and Ordering data		Article No.	Ord. code	Selection and Ordering data		Article No.	Ord. code
SITRANS P Compact pressure transmitters for pressure and absolute pressure with clamp-on remote seal		7 MF 8 0 1 0 -		SITRANS P Compact pressure transmitters for pressure and absolute pressure with clamp-on remote seal		7 MF 8 0 1 0 -	
2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of full-scale value Output 4 ... 20 mA		2		2-wire system Process temperature up to 140 °C (284 °F) Accuracy: 0.2 % of full-scale value Output 4 ... 20 mA		2	
Housing design (stainless steel mat. No. 1.4404/316L) / electr. connection				Measured range Overload pressure (continued)			
Housing with angled plug to DIN 43650, IP65, union nut made of polyamide		1		-1 ... 9 bar (-14.5 ... 130.5 psi)	60 bar (870 psi)	GA	
Housing with device plug M12, IP65, union nut made of polyamide		2		-1 ... 15 bar (-14.5 ... 217.6 psi)	60 bar (870 psi)	GB	
Housing with device plug M12, IP65, union nut made of stainless steel		3		0 ... 1 bar a (0 ... 14.5 psi a)	3 bar a (43.5 psi a)	HA	
Stainless steel field housing (small) with cable gland, IP65		4		0 ... 1.6 bar a (0 ... 23.2 psi a)	10 bar (145 psi)	HB	
Stainless steel field housing (small) with cable gland, IP67		5		0 ... 2.5 bar a (0 ... 36.3 psi a)	10 bar a (145 psi a)	HC	
Internal ventilation for measuring ranges < 16 bar (< 232 psi)				0 ... 4 bar a (0 ... 58 psi a)	10 bar a (145 psi a)	HD	
Measured range Overload pressure	0 ... 160 mbar (0 ... 2.32 psi)	BB		0 ... 6 bar a (0 ... 87 psi a)	60 bar a (870 psi a)	HE	
	0 ... 250 mbar (0 ... 3.63 psi)	BC		0 ... 10 bar a (0 ... 145 psi a)	60 bar a (870 psi a)	JA	
	0 ... 400 mbar (0 ... 5.8 psi)	BD		Special version (add Order code and plain text)		ZA	P1Y
	0 ... 600 mbar (0 ... 8.7 psi)	BE		Explosion protection			
	0 ... 1 bar (0 ... 14.5 psi)	CA		without			1
	0 ... 1.6 bar (0 ... 23.2 psi)	CB		with, to ATEX 100a, II 2 G, Ex ib IIC T6			2
	0 ... 2.5 bar (0 ... 36.3 psi)	CC		Further designs		Order code	
	0 ... 4 bar (0 ... 58 psi)	CD		Please add "-Z" to Article No. and specify Order code			
	0 ... 6 bar (0 ... 87 psi)	CE		Hygiene version		P01	
	0 ... 10 bar (0 ... 145 psi)	DA		Roughness of process connection: Foil $R_a < 0.8 \mu\text{m}$ ($3.15 \cdot 10^{-8}$ inch); Welded seams $R_a < 1.5 \mu\text{m}$ ($5.9 \cdot 10^{-8}$ inch)			
	0 ... 16 bar (0 ... 232 psi)	DB		Integral cooling element		K01	
	0 ... 25 bar (0 ... 363 psi)	DC		Process temperature max. 200 °C (392 °F) instead of 140 °C (284 °F)			
	0 ... 40 bar (0 ... 580 psi)	DD		Connections for pipe		R01	
	-160 ... 0 mbar (-2.32 ... 0 psi)	EB		Pipes to DIN 11850		R02	
	-250 ... 0 bar (-3.73 ... 0 psi)	EC		ISO pipes to ISO 2463		R03	
	-400 ... 0 bar (-5.8 ... 0 psi)	ED		Pipes to O. D. Tubing "BS 4825 Part 1"			
	-600 ... 0 bar (-8.7 ... 0 psi)	EE		Certificates		C11	
	-1 ... 0 bar (-14.5 ... 0 psi)	FA		Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2			
	-1 ... 0.6 bar (-14.5 ... 8.7 psi)	FB		Inspection certificate to EN 10204-3.1		C12	
	-1 ... 1.5 bar (-14.5 ... 21.8 psi)	FC		Use of FDA-listed remote seal filling liquids certified by test report to EN 10204-2.2		C17	
	-1 ... 3 bar (-14.5 ... 43.5 psi)	FD		Roughness depth measurement R_a certified by test report to EN 10204-3.1		C18	
	-1 ... 5 bar (-14.5 ... 72.5 psi)	FE		Certification to EHEDG for clamp-on seals with aseptic screwed gland to DIN 11864		C19	

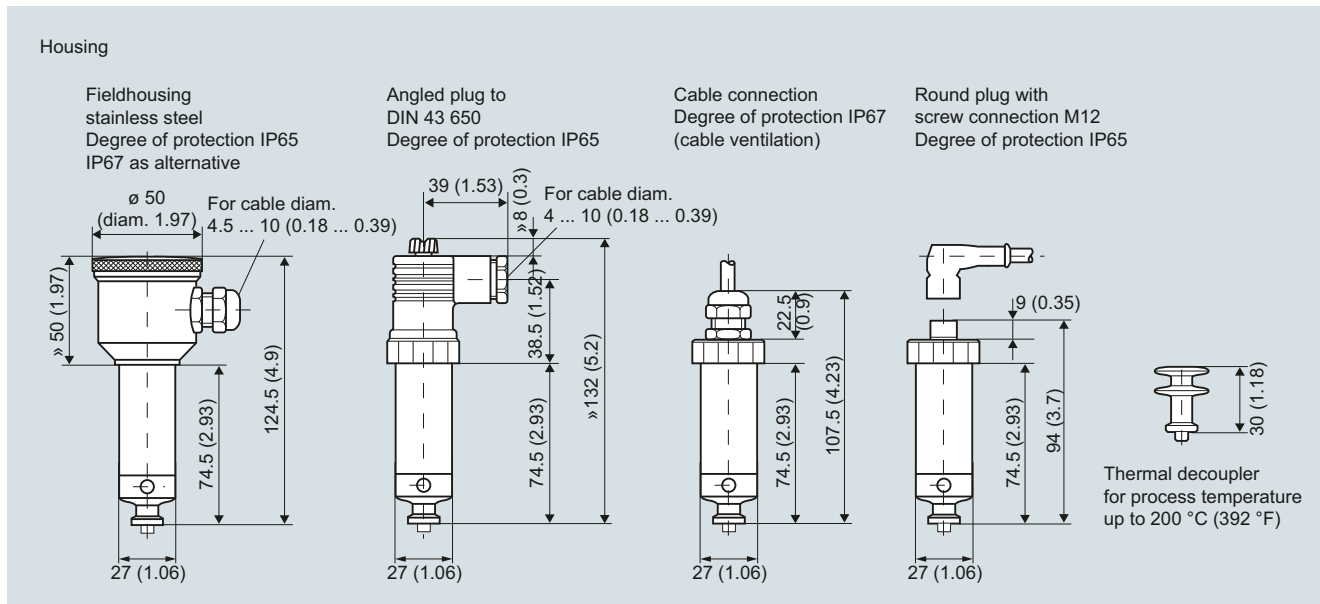
Pressure Measurement

Pressure transmitters

Single-range transmitters for general applications

SITRANS P Compact for gauge and absolute pressure

Dimensional drawings

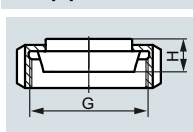


SITRANS P Compact, dimensions in mm (inch)

Process connections

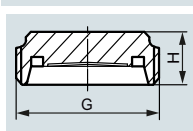
Diaphragm seal with quick-release clamp

Milk pipe union to DIN 11851 with slotted union nut



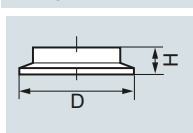
DN	PN	H mm (inch)	G
25	40	24 (0.95)	Rd. 52 x 1/6"
32	40	24 (0.95)	Rd. 58 x 1/6"
40	40	24 (0.95)	Rd. 65 x 1/6"
50	25	25.1 (0.99)	Rd. 78 x 1/6"
65	25	28.6 (1.13)	Rd. 95 x 1/6"

Milk pipe union to DIN 11851 with threaded socket



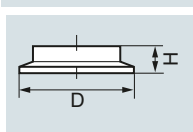
DN	PN	H mm (inch)	G
25	40	-	Rd. 52 x 1/6"
32	40	20 (0.79)	Rd. 58 x 1/6"
40	40	20 (0.79)	Rd. 65 x 1/6"
50	25	20 (0.79)	Rd. 78 x 1/6"
65	25	22 (0.87)	Rd. 95 x 1/6"

Clamp connection to DIN 32676



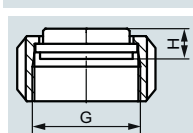
DN	PN	H mm (inch)	D mm (inch)
25	16	14 (0.55)	50.5 (2)
40	16	14 (0.55)	50.5 (2)
50	16	14 (0.55)	64 (2.52)

Clamp connection to ISO 2852



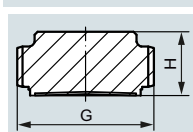
DN	PN	H mm (inch)	D mm (inch)
1"	16	14 (0.55)	50.5 (2)
1½"	16	12 (0.47)	50.5 (2)
2"	16	14 (0.55)	64 (2.52)
2½"	16	14 (0.55)	77.5 (3.05)

IDF standard with slotted union nut



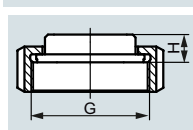
DN	PN	H mm (inch)	G inch (IDF thread)
1"	40	21 (0.83)	1"
1½"	40	13.5 (0.53)	1½"
2"	25	15 (0.59)	2"

IDF standard with threaded socket



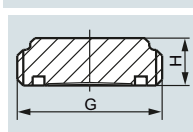
DN	PN	H mm (inch)	G inch (IDF thread)
1"	40	21 (0.83)	1"
1½"	40	13.5 (0.53)	1½"
2"	25	15 (0.59)	2"

SMS standard with slotted union nut



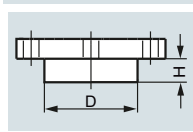
DN	PN	H mm (inch)	G
1"	40	16 (0.63)	Rd 40 x 1.6"
1½"	40	16 (0.63)	Rd 60 x 1.6"
2"	25	16 (0.63)	Rd 70 x 1.6"

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)

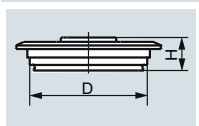
Pressure Measurement

Pressure transmitters
Single-range transmitters for general applications

SITRANS P Compact for gauge and absolute pressure

1

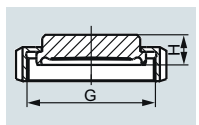
Varivent connection



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)

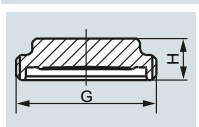
Diaphragm seal with aseptic connection

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



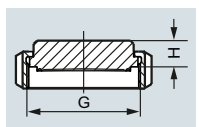
DN	PN	H mm (inch)	G
1"	40	20 (0.79)	Rd 52 x 1/6"
1½"	40	20 (0.79)	Rd 58 x 1/6"
2"	25	20 (0.79)	Rd 65 x 1/6"
2½"	25	20 (0.79)	Rd 78 x 1/6"

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



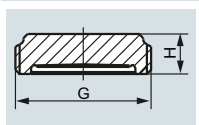
DN	PN	H mm (inch)	G
1"	40	15 (0.59)	Rd 52 x 1/6"
1½"	40	15 (0.59)	Rd 58 x 1/6"
2"	25	15 (0.59)	Rd 65 x 1/6"
2½"	25	15 (0.59)	Rd 78 x 1/6"

Aseptic screwed NEUMO BioConnect with slotted union nut



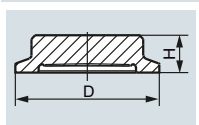
DN	PN	H mm (inch)	G
25	16	15 (0.59)	M 42 x 2
32	16	15 (0.59)	M 52 x 2
40	16	15 (0.59)	M 56 x 2
50	16	15 (0.59)	M 68 x 2

Aseptic screwed NEUMO BioConnect with threaded socket



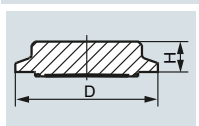
DN	PN	H mm (inch)	G
25	16	20 (0.79)	M 42 x 2
32	16	20 (0.79)	M 52 x 2
40	16	20 (0.79)	M 56 x 2
50	16	20 (0.79)	M 68 x 2

Aseptic screwed NEUMO BioConnect with clamp connection, form R



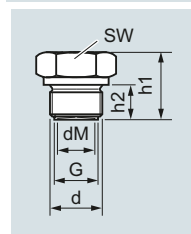
DN	PN	H mm (inch)	D mm (inch)
25	40	20 (0.79)	50.5 (2)
32	40	20 (0.79)	50.5 (2)
40	40	20 (0.79)	64 (2.52)
50	25	20 (0.79)	77.4 (3.05)

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)

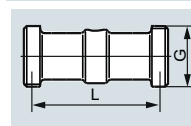
Male thread DIN 3852, form A



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)

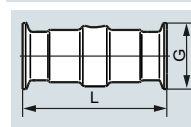
Clamp-on remote seal (screwed gland at both ends) with quick-release clamps

Milk pipe union to DIN 11851 with threaded socket



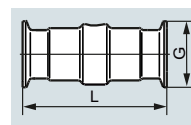
DN	PN	L mm (inch)	G
25	40	110 (4.33)	Rd 52 x 1/6"
32	40	110 (4.33)	Rd 58 x 1/6"
40	40	110 (4.33)	Rd 65 x 1/6"
50	25	110 (4.33)	Rd 78 x 1/6"
65	25	110 (4.33)	Rd 95 x 1/6"

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)

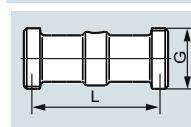
Clamp connection to ISO 2852



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)

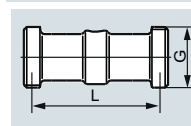
Clamp-on seal with aseptic connection

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

Pressure Measurement

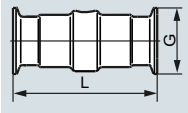
Pressure transmitters

Single-range transmitters for general applications

1

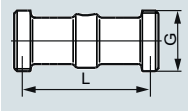
SITRANS P Compact for gauge and absolute pressure

Aseptic screwed NEUMO BioConnect with clamp connection, form R



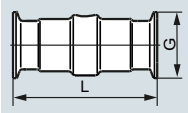
DN	PN	L mm (inch)	D mm (inch)
25	16	110 (4.33)	50.4 (2)
32	16	110 (4.33)	50.4 (2)
40	16	110 (4.33)	64 (2.52)
50	16	110 (4.33)	77.4 (3.05)

Aseptic screwed gland SÜDMO with threaded socket W 501



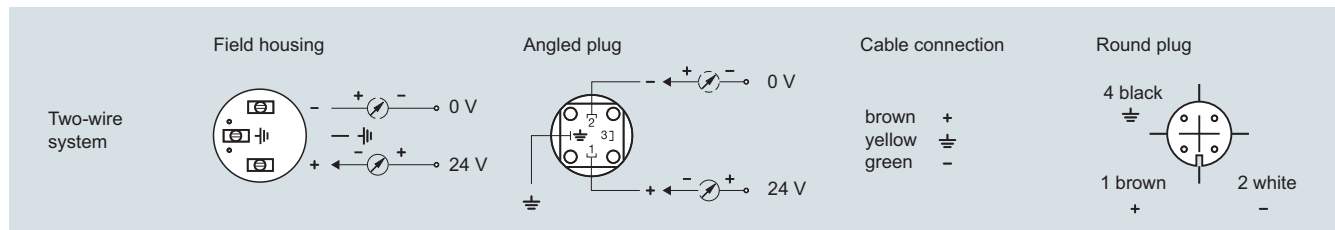
DN	PN	L mm (inch)	G
1"	25	110 (4.33)	Rd 44 x 1/6"
1½"	25	110 (4.33)	Rd 58 x 1/6"
2"	20	110 (4.33)	Rd 78 x 1/6"

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 casing. The pressure transmitter is approved with "intrinsically safe" type of protection. It can be used in zone 1 or zone 0.

Benefits

- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- Extensive diagnosis and simulation functions
- 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 Fieldbus signal, 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 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 span is 0.008 bar a (0.12 psi a), the largest is 30 bar a (435 psi a).

Pressure Measurement

Pressure transmitters
for food, pharmaceuticals and biotechnology

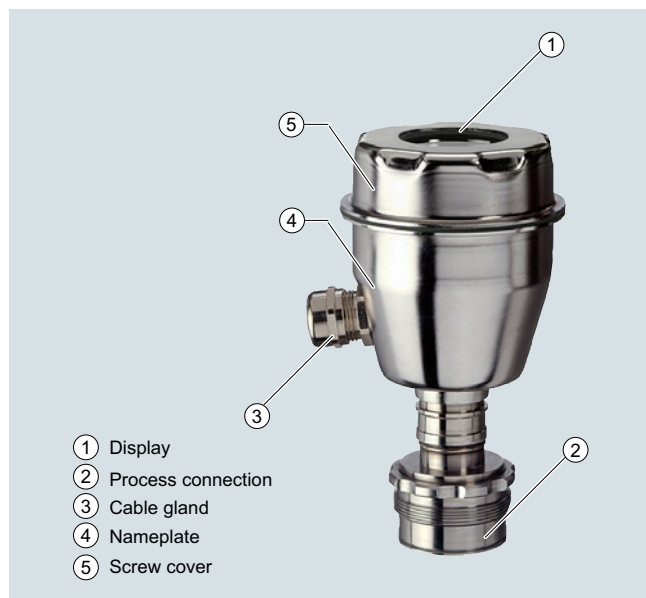
SITRANS P300 for gauge and absolute pressure

1

Design

The device comprises:

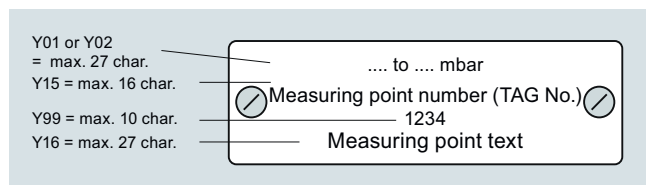
- Electronics
- Housing
- Measuring cell



Perspective view of SITRANS P300

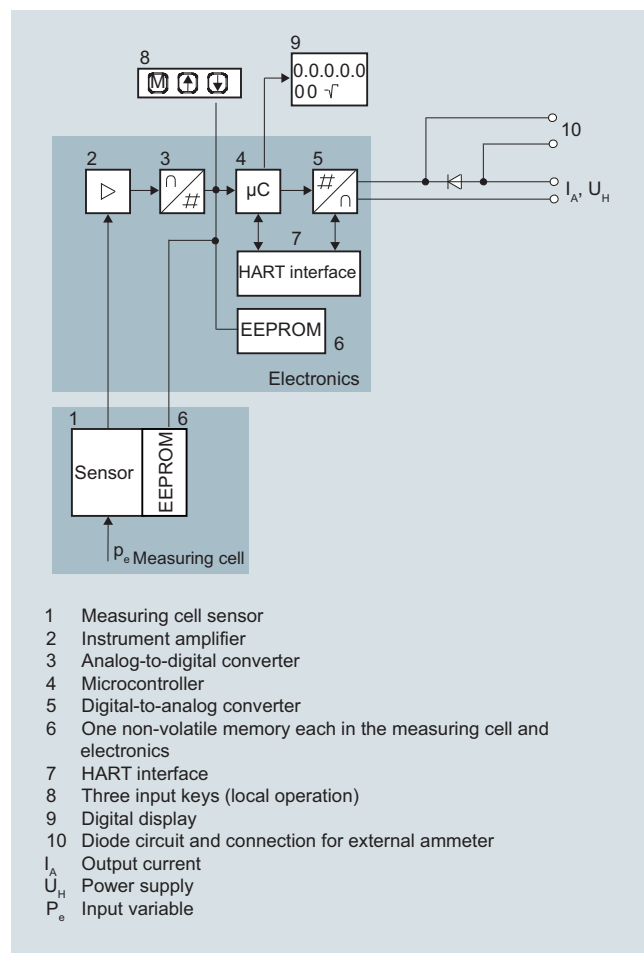
The housing has a screw-on lid (5) and, depending on the version, is with or without an inspection window. The electrical terminal housing, the buttons for operation of the device are located under this lid and, depending on the version, the display. The connections for the auxiliary power U_H and the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

Example of attached measuring points sign



Function

Operation of electronics with HART communication



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).

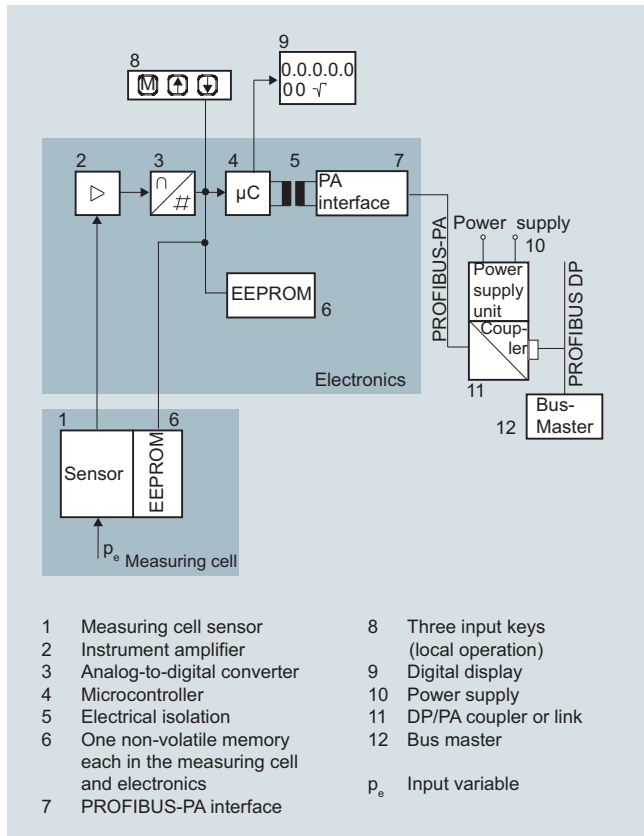
Pressure Measurement

Pressure transmitters
for food, pharmaceuticals and biotechnology

SITRANS P300 for gauge and absolute pressure

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Operation of electronics with PROFIBUS PA communication

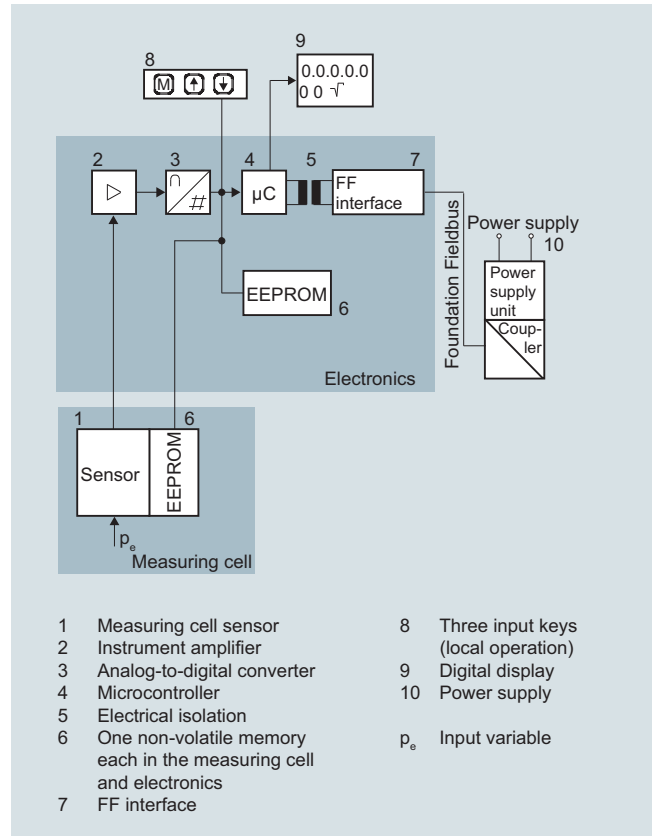


Function diagram of electronics

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



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 digitalized 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:

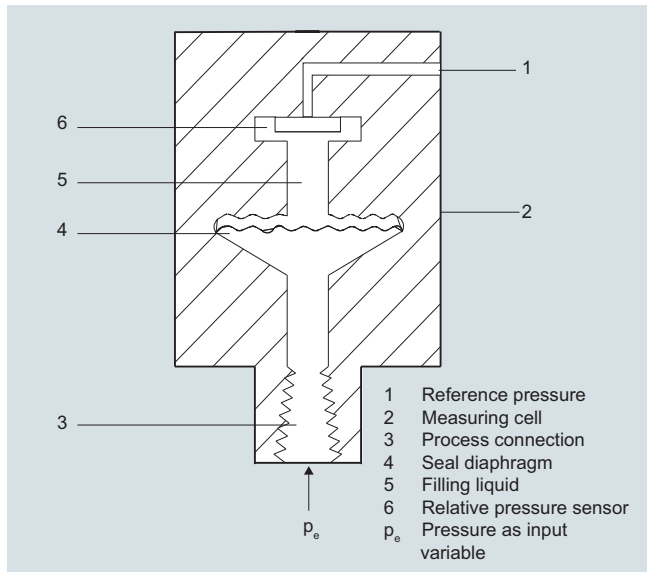
- G $\frac{1}{2}$
- $\frac{1}{2}$ -14 NPT
- Flush-mounted diaphragm:
 - Flanges to EN
 - Flanges to ASME
 - NuG and pharmaceutical connections

Pressure Measurement

Pressure transmitters
for food, pharmaceuticals and biotechnology

SITRANS P300 for gauge and absolute pressure

Measuring cell for gauge pressure

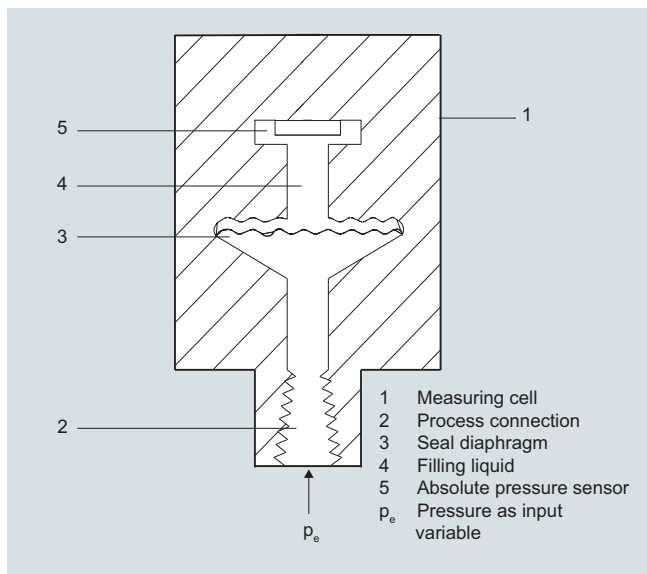


Measuring cell for gauge pressure, function diagram

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

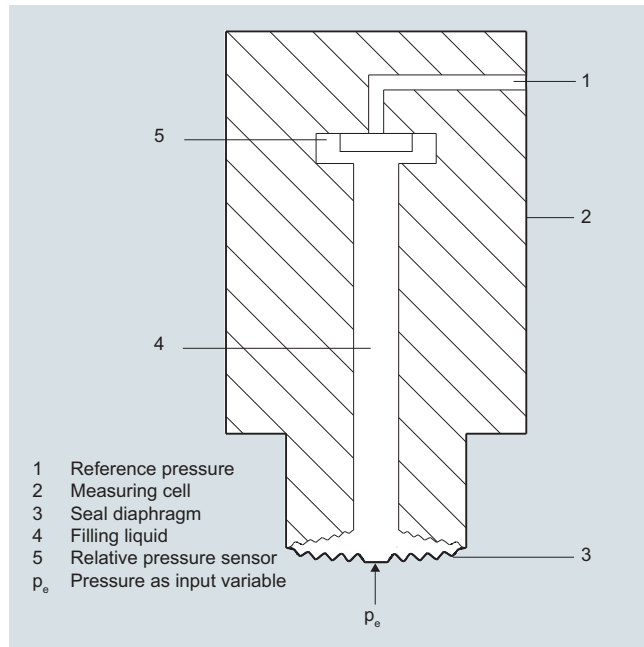
Measuring cell for absolute pressure



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

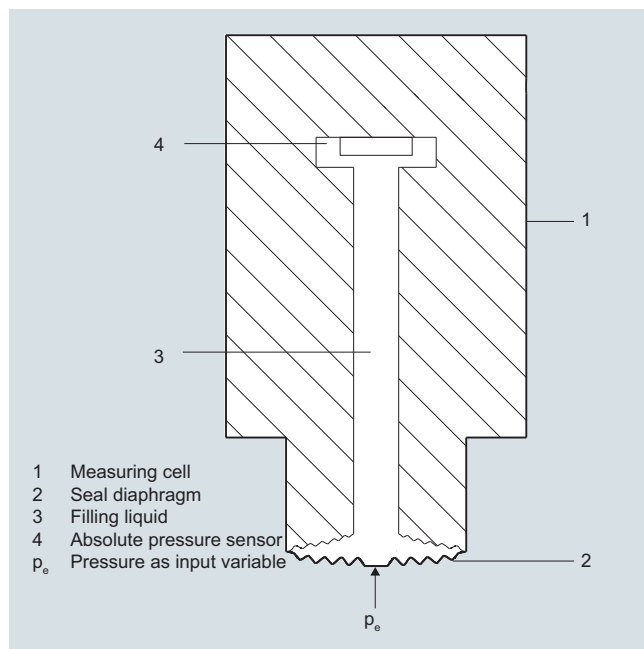


Measuring cell for gauge pressure, front-flush diaphragm, function diagram

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 spans ≤ 63 bar (≤ 926.1 psi) measure the input pressure compared to atmospheric, transmitters with 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

Pressure Measurement

Pressure transmitters for food, pharmaceuticals and biotechnology

SITRANS P300 for gauge and absolute pressure

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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

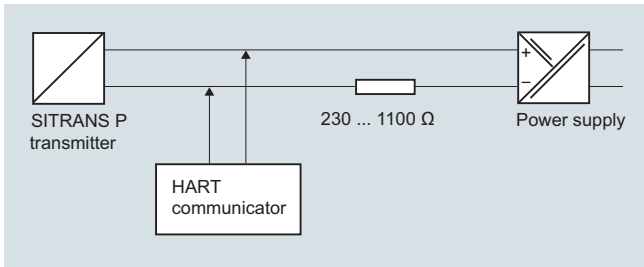
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

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

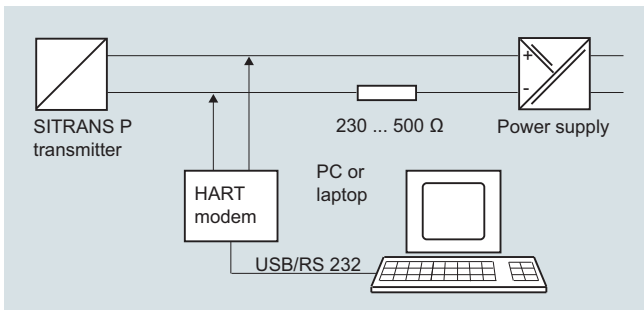
Parameterization using HART communication

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
Start of scale	x	x
Full-scale value	x	x
Electrical damping	x	x
Start-of-scale value without application of a pressure ("Blind setting")	x	x
Full-scale value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x ¹⁾
Type of dimension and actual dimension	x	x
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 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

Pressure Measurement

Pressure transmitters
for food, pharmaceuticals and biotechnology

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SITRANS P300 for gauge and absolute pressure

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 ₂ O, mmH ₂ O (4 °C), inH ₂ O, inH ₂ O (4 °C), ftH ₂ O (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.

Pressure Measurement

Pressure transmitters
for food, pharmaceuticals and biotechnology

SITRANS P300 for gauge and absolute pressure

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Technical specifications

SITRANS P300 for gauge and absolute pressure

Gauge pressure input

Measured variable

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

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

HART

PROFIBUS PA/ FOUNDATION Fieldbus

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
- Measuring cell with inert filling liquid

Upper measuring limit

30 mbar a/3 kPa a/0.44 psi a

30 mbar a/3 kPa a/0.44 psi a

100 % of max. span

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

Absolute pressure input

Measured variable

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

Absolute pressure

HART

PROFIBUS PA/ FOUNDATION Fieldbus

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 inH₂O a
0.13 ... 3.63 psi a

250 mbar a
25 kPa a
100 inH₂O 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 inH₂O a
0.63 ... 18.86 psi a

1300 mbar a
130 kPa a
525 inH₂O

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

Pressure Measurement

Pressure transmitters
for food, pharmaceuticals and biotechnology

SITRANS P300 for gauge and absolute pressure

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 process temperature $-20\text{ °C} < \vartheta \leq +60\text{ °C}$
($-4\text{ °F} < \vartheta \leq +140\text{ °F}$)

30 mbar a/3 kPa a/0.44 psi a

- for process temperature
 $60\text{ °C} < \vartheta \leq +100\text{ °C}$ (max. 85 °C for measuring cell 30 bar)
($140\text{ °F} < \vartheta \leq +212\text{ °F}$ (max. 185 °F for meas. cell 435 psi))

30 mbar a + 20 mbar a · ($\vartheta - 60\text{ °C}$)/ °C
3 kPa a + 2 kPa a · ($\vartheta - 60\text{ °C}$)/ °C
0.44 psi a + 0.29 psi a · ($\vartheta - 140\text{ °F}$)/ °F

Upper measuring limit

100 % of max. span
(for oxygen measurement max. 100 bar/10 MPa/1450 psi und 60 °C (140 °F)
ambient temperature/process temperature)

Start of scale value

Between the measuring limits (fully adjustable)

Input of gauge pressure, with front-flush diaphragm

Measured variable

Gauge pressure, front-flush

Span (continuously adjustable) or measuring range,
max. operating pressure and max. test pressure

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

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
- Measuring cell with Neobee

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

Upper measuring limit

100% of max. span

Input of absolute pressure, with front-flush diaphragm

Measured variable

Absolute pressure, front-flush

Span (continuously adjustable) or measuring range,
max. operating pressure and max. test pressure

HART	PROFIBUS PA/ FOUNDATION Fieldbus		
Span	Nominal measuring range	Max. operating pressure MAWP (PS)	Max. perm. test pressure
43 ... 1300 mbar a	1300 mbar a	2.6 bar a	10 bar a
4.3 ... 130 kPa a	130 kPa a	260 kPa a	1 MPa a
17 ... 525 inH ₂ O a	525 inH ₂ O a	37.7 psi a	145 psi a
160 ... 5000 mbar a	5000 mbar a	10 bar a	30 bar a
16 ... 500 kPa a	500 kPa a	1 MPa a	3 MPa a
2.32 ... 72.5 psi a	72.5 psi a	145 psi a	435 psi a
1 ... 30 bar a	30 bar a	45 bar a	100 bar a
0.1 ... 3 MPa a	3 MPa a	4.5 MPa a	10 MPa a
14.5 ... 435 psi a	435 psi a	653 psi a	1450 psi a

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

Lower measuring limit

0 mbar a/0 kPa a/0 psi a

Upper measuring limit

100 % of max. span

Output

Output signal

HART	PROFIBUS PA/ FOUNDATION Fieldbus
4 ... 20 mA	Digital PROFIBUS PA or FOUNDATION Fieldbus signal

Physical bus

-

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)

Pressure Measurement

Pressure transmitters

for food, pharmaceuticals and biotechnology

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SITRANS P300 for gauge and absolute pressure

Measuring accuracy for gauge pressure

Reference conditions

According to IEC 60770-1

- Increasing characteristic
- Start-of-scale 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)

$r = \text{max. measuring span} / \text{set measuring span or nominal pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

$r \leq 1.25 :$ $\leq 0.075 \%$
 $1.25 < r \leq 30 :$ $\leq (0.008 \cdot r + 0.065) \%$

- 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

$r \leq 5 :$ $\leq 0.075 \%$
 $5 < r \leq 100 :$ $\leq (0.005 \cdot r + 0.05) \%$

- 400 bar/40 MPa/5802 psi

$r \leq 3 :$ $\leq 0.075 \%$
 $3 < r \leq 10 :$ $\leq (0.0029 \cdot r + 0.071) \%$
 $10 < r \leq 100 :$ $\leq (0.005 \cdot r + 0.05) \%$

Influence of ambient temperature
 (in percent per 28 °C (50 °F))

- 250 mbar/25 kPa/3.6 psi

$\leq (0.16 \cdot r + 0.1) \%$

- 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

$\leq (0.07 \cdot r + 0.08) \%$

Long-term stability (temperature change ± 30 °C (± 54 °F))

- 250 mbar/25 kPa/3.6 psi

$\leq (0.25 \cdot r) \%$ per year

- 1 bar/100 kPa/14.5 psi
 4 bar/400 kPa/58 psi

$\leq (0.25 \cdot r) \%$ 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

$\leq (0.125 \cdot r) \%$ 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 rated measuring range

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SITRANS P300 for gauge and absolute pressure

Measuring accuracy for absolute pressure

Reference conditions

According to IEC 60770-1

- Increasing characteristic
- Start-of-scale 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)

$r = \text{max. measuring span/set measuring span or nominal pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- $r \leq 10$

$\leq 0.1 \%$

- $10 < r \leq 30$

$\leq 0.2 \%$

Influence of ambient temperature
(in percent per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a

$\leq (0.15 \cdot r + 0.1) \%$

- 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

$\leq (0.08 \cdot r + 0.16) \%$

Long-term stability (temperature change ± 30 °C (± 54 °F))

$\leq (0.25 \cdot r) \%$ in 5 years

Effect of mounting position (in pressure per change in angle)

$\leq 0.05 \text{ mbar}/0.005 \text{ kPa}/0.000725 \text{ psi}$ 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 measuring range

Measuring accuracy for gauge and absolute pressure, with front-flush diaphragm

According to IEC 60770-1

Reference conditions

- Increasing characteristic
- Start-of-scale 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)

$r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- $r \leq 5$

$\leq 0.075 \%$

- $5 < r \leq 100$

$\leq (0.005 \cdot r + 0.05) \%$

- $r \leq 10$

-

$\leq 0.2 \%$

- $10 < r \leq 30$

-

$\leq 0.4 \%$

Influence of ambient temperature
(as percentage per 28 °C (50 °F))

$\leq (0.08 \cdot r + 0.16) \%$

$\leq (0.16 \cdot r + 0.24) \%$

Effect of process temperature
(in pressure per temperature change)

- Temperature difference between process temperature and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

Long-term stability (temperature change ± 30 °C (± 54 °F))

$(0.25 \cdot r) \%$ in 5 years

Effect of mounting position (in pressure per change in angle)

0.4 mbar/0.04 kPa/0.006 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 measuring range

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Rated conditions

Installation conditions

Ambient temperature

- Measuring cell with silicone oil
- Measuring cell with Neobee oil (FDA-compliant, with flush-mounted diaphragm)
- Measuring cell with inert liquid
- Display readable
- Storage temperature

Observe the temperature class in areas subject to explosion hazard.

-40 ... +85 °C (-40 ... +185 °F)

-10 ... +85 °C (14 ... +185 °F)

-40 ... +85 °C (-40 ... +185 °F)

-30 ... +85 °C (-22 ... +185 °F)

-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
- according to NEMA 250

IP65, IP68

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
- Measuring cell with silicone oil (FDA-compliant, with flush-mounted diaphragm)
- Measuring cell with Neobee oil "Measuring cell with Neobee oil (FDA-compliant, with flush-mounted diaphragm)
- Measuring cell with silicone oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)
- Measuring cell with Neobee oil, with temperature decoupler (only for gauge pressure version with flush-mounted diaphragm)
- Measuring cell with inert liquid
- Measuring cell with high-temperature oil (only for gauge pressure version with flush-mounted diaphragm)

-40 ... +100 °C (-40 ... +212 °F)

-40 ... +150 °C (-40 ... +302 °F)

-10 ... +150 °C (-14 ... +302 °F)

-40 ... +200 °C (-40 ... +392 °F)

-10 ... +200 °C (14 ... +392 °F)

-20 ... +100 °C (-4 ... +212 °F)

-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
- Oval flange
- Seal diaphragm
- Measuring cell filling

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

Stainless steel, mat. no. 1.4404/316L

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

- Silicone oil
- Inert filling liquid

Process connection

- G $\frac{1}{2}$ B to EN 837-1
- Female thread $\frac{1}{2}$ -14 NPT
- Oval flange PN 160 (MAWP 2320 psi) with fastening thread:
- $\frac{7}{16}$ -20 UNF to IEC 61518/DIN EN 61518
- M10 as per DIN 19213

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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	<ul style="list-style-type: none"> • Silicone oil • Inert filling liquid • FDA compliant fill fluid (Neobee oil)
Process connection	<ul style="list-style-type: none"> • Flanges as per EN and ASME • F&B and pharmaceutical flanges
Surface quality touched-by-media	R_a -values $\leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$)/welds $R_{a1} \leq 1.6 \mu\text{m}$ (64 $\mu\text{-inch}$) (Process connections acc. to 3A; R_a -values $\leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$)/welds $R_a \leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$))

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 power supply	-	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 \leq basic current	-	Yes
• Max. fault current in the event of a fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

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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	
<u>Explosion protection</u>		
Intrinsic safety "i"	PTB 05 ATEX 2048	
• Marking	II 1/2 G Ex ia IIC/II B 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: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	To certified intrinsically-safe circuits with peak values: <u>FISCO supply unit:</u> $U_i = 17.5 \text{ V}$, $I_i = 380 \text{ mA}$, $P_i = 5.32 \text{ W}$ <u>Linear barrier:</u> $U_i = 24 \text{ V}$, $I_i = 250 \text{ mA}$, $P_i = 1.2 \text{ W}$ $C_i = 1.1 \text{ nF}$ $L_i \leq 7 \mu\text{H}$
• Effective inner capacitance:	$C_i = 6 \text{ nF}$	
• Effective internal inductance:	$L_i = 0.4 \text{ mH}$	
Explosion protection to FM for USA <u>and</u> Canada (cFM _{US})	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); (NI)	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	
• Identification (DIP) or (IS)		
Dust explosion protection for zone 20/21/22	PTB 05 ATEX 2048	
• Marking	II 1 D Ex ia IIC T120 °C Da II 1/2 D Ex ia IIC T120 °C Da/Db II 2 D Ex ib IIC 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: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$ $C_i = 6 \text{ nF}$ $L_i = 0.4 \mu\text{H}$	To certified intrinsically-safe circuits with peak values: $U_i = 24 \text{ V}$, $I_i = 380 \text{ mA}$, $P_i = 5.32 \text{ mW}$ $C_i = 5 \text{ nF}$ $L_i = 10 \mu\text{H}$
• Effective inner capacitance:		
• Effective internal inductance:		
Type of protection Ex nA/nL/ic (Zone 2)	PTB 05 ATEX 2048	
• Marking	II 2/3 G Ex ic IIC/II B 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: $U_m = 45 \text{ V}$	To certified intrinsically-safe circuits with peak values: $U_m = 32 \text{ V}$
• Ex ic connection	To certified intrinsically-safe circuits with peak values: $U_i = 45 \text{ V}$	To certified intrinsically-safe circuits with peak values: $U_i = 32 \text{ V}$
• Effective inner capacitance:	$C_i = 6 \text{ nF}$	$C_i = 5 \text{ nF}$
• Effective internal inductance:	$L_i = 0.4 \text{ mH}$	$L_i = 20 \mu\text{H}$

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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) parameterizable (last good value, substitute value, incorrect value)
- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
- Limit monitoring	Yes
- Square-rooted characteristic for flow measurement	
• 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

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Selection and Ordering data		Article No.
SITRANS P300 pressure transmitters for relative and absolute pressure , single-chamber measuring housing, rating plate inscription in English		
4 ... 20 mA/HART		7MF8023 -
PROFIBUS PA		7MF8024 -
FOUNDATION Fieldbus (FF)		7MF8025 -
➤ 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 1/2-14 NPT" (recommended version) ¹⁾ 2) 3) 4) 5)		Y
Process connection		
• Connection shank G1/2B to EN 837-1		0
• Female thread 1/2-14 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 1/2 -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 1/2-14 NPT metal thread ¹⁰⁾		H
• Screwed gland 1/2-14 NPT stainless steel thread		J

Selection and Ordering data		Article No.
SITRANS P300 pressure transmitters for relative and absolute pressure , single-chamber measuring housing, rating plate inscription in English		
4 ... 20 mA/HART		7MF8023 -
PROFIBUS PA		7MF8024 -
FOUNDATION Fieldbus (FF)		7MF8025 -
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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⁾		5
• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc ¹¹⁾		6
• With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS and FOUNDATION Fieldbus equipment: pressure units) ¹¹⁾		7
• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane ¹¹⁾		

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

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

- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 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
- The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- Remote seal for direct mounting only available in combination with process connection 1/2-14 NPT.
- M10 fastening thread: Max. span 160 bar (2320 psi) 7/16-20 UNF and M12 fastening thread: Max. span 400 bar (5802 psi)
- Only available together with electrical connection option A
- Only available together with electrical connection options B, C or G.
- Only together with HART electronics.
- Without cable gland.
- Display cannot be turned.

Pressure Measurement

Pressure transmitters
for food, pharmaceuticals and biotechnology

SITRANS P300 for gauge and absolute pressure

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Selection and Ordering data		Article No.
SITRANS P300 pressure transmitters for relative and absolute pressure with front-flush membrane , single-chamber measuring housing, rating plate inscription in English		
4 ... 20 mA/HART		7 MF 8 1 2 3 -
PROFIBUS PA		7 MF 8 1 2 4 -
FOUNDATION Fieldbus (FF)		7 MF 8 1 2 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		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		
<ul style="list-style-type: none"> Flange version with Order code M., N., R. or Q.. (see "Further designs") 		7
Non-wetted parts materials		
<ul style="list-style-type: none"> Stainless steel, deep-drawn and electrolytically polished 		4
Version		
<ul style="list-style-type: none"> Standard versions 		1
Explosion protection		
<ul style="list-style-type: none"> None With ATEX, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety (Ex ia)" Zone 20/21/22³⁾ Ex nA/nL (Zone 2)⁴⁾ with FM "intrinsic safety" (cFM_{US}) 		A B C E M
Electrical connection / cable entry		
<ul style="list-style-type: none"> Screwed gland M20x1.5 (polyamide)⁵⁾ Screwed gland M20x1.5 (metal) Screwed gland M20x1.5 (stainless steel) Device plug M12 (stainless steel), without cable socket Screwed gland ½-14 NPT metal thread ⁶⁾ Screwed gland ½-14 NPT stainless steel thread ⁶⁾ 		A B C G H J

Selection and Ordering data		Article No.
SITRANS P300 pressure transmitters for relative and absolute pressure with front-flush membrane , single-chamber measuring housing, rating plate inscription in English		
4 ... 20 mA/HART		7 MF 8 1 2 3 -
PROFIBUS PA		7 MF 8 1 2 4 -
FOUNDATION Fieldbus (FF)		7 MF 8 1 2 5 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
Display		
<ul style="list-style-type: none"> Without display, with keys, closed lid 		1
<ul style="list-style-type: none"> With display and keys, closed lid⁷⁾ 		2
<ul style="list-style-type: none"> With display and keys, lid with polycarbonate disc (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units)⁷⁾ 		4
<ul style="list-style-type: none"> With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc⁷⁾ 		5
<ul style="list-style-type: none"> With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units)⁷⁾ 		6
<ul style="list-style-type: none"> With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane⁷⁾ 		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.

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Selection and Ordering data	Order code			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
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 • French • Spanish • Italian	B10 B12 B13 B14	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓
English rating plate Pressure units in inH ₂ O and/or psi	B21	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2¹⁾	C11	✓	✓	✓
Inspection certificate²⁾ 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⁾ • DN 40, PN 40 • DN 40, PN 100 • DN 50, PN 16 • DN 50, PN 40 • DN 80, PN 16 • DN 80, PN 40	M11 M13 M23 M04 M14 M06 M16	✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓
Flanges to ASME B16.5 • 1", class 150 ⁴⁾ • 1½", class 150 • 2", class 150 • 3", class 150 • 4", class 150 • 1", class 300 ⁴⁾ • 1½", class 300 • 2", class 300 • 3", class 300 • 4", class 300	M40 M41 M42 M43 M44 M45 M46 M47 M48 M49	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
Threaded connector to DIN 3852-2, form A, thread to ISO 228 • G ¾"-A, front-flush ⁴⁾ • G 1"-A, front-flush ⁴⁾ • G 2"-A, front-flush	R01 R02 R04	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Tank connection⁵⁾ Sealing is included in delivery • TG 52/50, PN 40 • TG 52/150, PN 40	R10 R11	✓ ✓	✓ ✓	✓ ✓

Selection and Ordering data	Order code			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
Sanitary process connection according DIN 11851 (Dairy connection with slotted union nut) • DN 50, PN 25 • DN 80, PN 25	N04 N06	✓ ✓	✓ ✓	✓ ✓
Tri-Clamp connection according DIN 32676/ISO 2852 3A compliant ⁶⁾ • DN 50/2", PN 16 • DN 65/2.5", PN 10 • Clamp 2" ISO 2852 PN 16 • Clamp 3" ISO 2852 PN 16	N14 N15 N22 N23	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓	✓ ✓ ✓ ✓
Varivent connection 3A and EHEDG compliant ⁶⁾ • Type N = 68 for Varivent housing DN 40 ... 125 and 1½" ... 6", PN 40	N28	✓	✓	✓
Temperature decoupler up to 200 °C⁷⁾ for front-flush diaphragm version	P00	✓	✓	✓
Sanitary process connection to DRD • DN 50, PN 40	M32	✓	✓	✓
SMS threaded socket • 2" • 2½" • 3"	M73 M74 M75	✓ ✓ ✓	✓ ✓ ✓	✓ ✓ ✓
Sanitary process connection to NEUMO Bio-Connect screw connection 3A and EHEDG compliant ⁶⁾ • DN 50, PN 16 • DN 65, PN 16 • DN 80, PN 16 • DN 100, PN 16 • DN 2", PN 16 • DN 2½", PN 16 • DN 3", PN 16 • DN 4", PN 16	Q05 Q06 Q07 Q08 Q13 Q14 Q15 Q16	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓
Sanitary process connection to NEUMO Bio-Connect S flange connection • DN 2", PN 16	Q72	✓	✓	✓

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Selection and Ordering data	Order code			
Further designs		HART	PA	FF
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 Form A 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			
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, bar, kPa, MPa, psi	Y01	✓	✓ ⁸⁾	
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 TAG Max. 8 characters, specify in plain text: Y17:	Y17	✓		
Setting of the display 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 ₂ O ³⁾ , inH ₂ O ³⁾ , ftH ₂ O ³⁾ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or %) ref. temperature 20 °C	Y21	✓	✓	✓
Setting of the display in non-pressure units⁹⁾ 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)	Y22 + Y01	✓		
Preset bus address (possible between 1 ... 126) Specify in plain text: Y25:	Y25		✓	✓

Factory mounting of valve manifolds, see accessories.

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

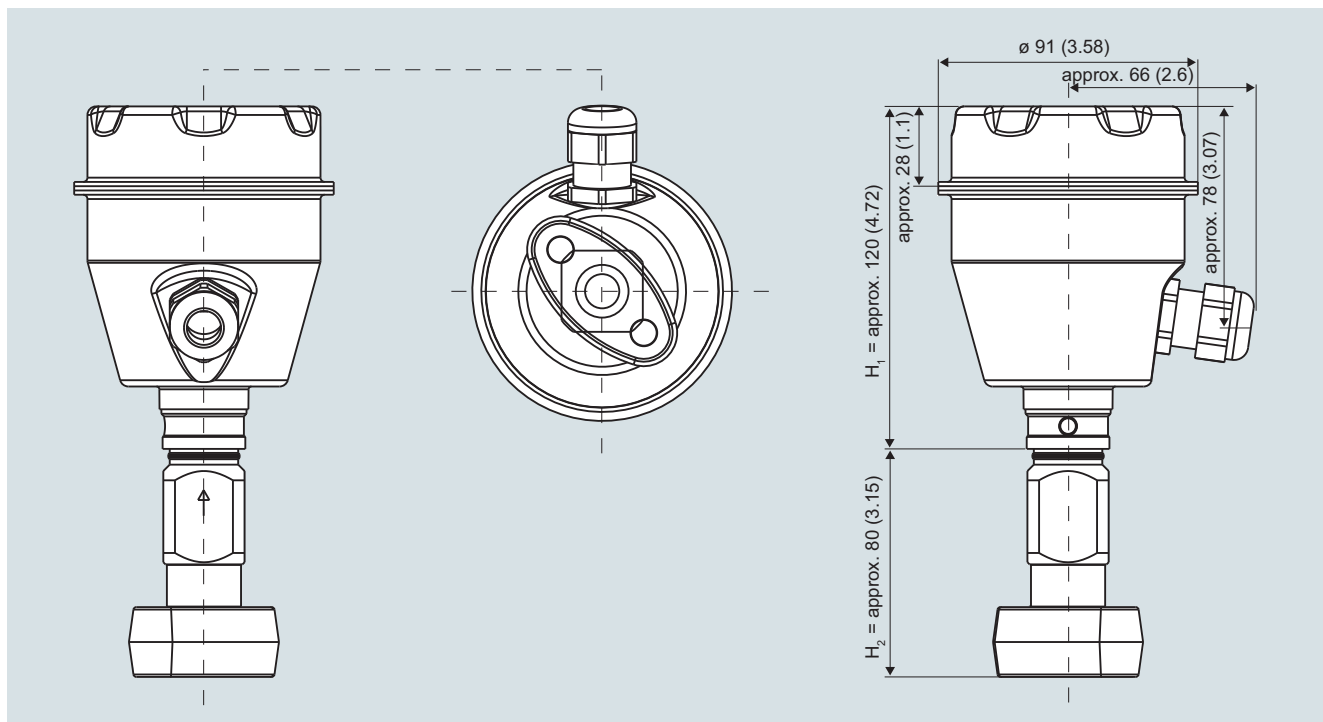
✓ = available

Ordering example

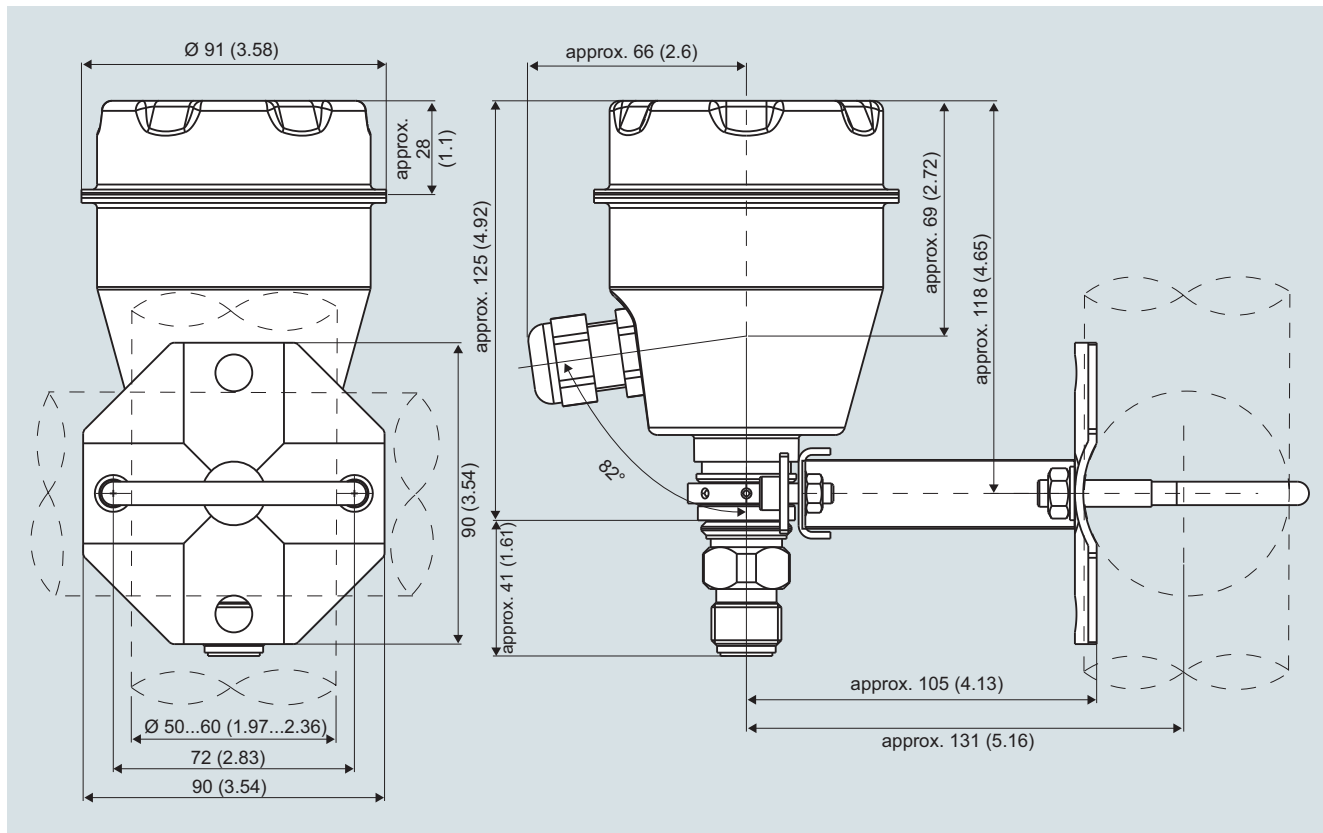
Item line: 7MF8023-1DB24-1AB7-Z
B line: A02 + Y01 + Y21
C line: Y01: 1 ... 10 bar (14.5 ... 145 psi)
C line: Y21: bar (psi)

- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- Special seal in Viton included in the scope of delivery (FKM; temperature range -20 ... +200 °C (-4 ... +392 °F))
- Cannot be combined with Order code P00. Can only be ordered with sili-cone oil measuring cell filling.
- The weldable socket can be ordered under accessories.
- 3A compliance ensured only when 3A compliant sealing rings are used.
- Conformity according to 3A and EHEDG. The maximum permissible temperatures of the medium depend on the respective cell fillings (see medium conditions).
- Measuring accuracies for PROFIBUS PA transmitters with Option Y01 are calculated in the same way as for HART devices.
- 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)

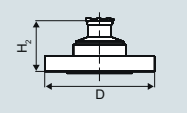
Pressure transmitters for food, pharmaceuticals and biotechnology

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

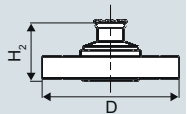
Pressure Measurement

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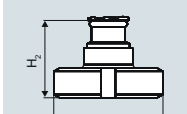
SITRANS P300 for gauge and absolute pressure**1****Flanges according to EN and ASME**Flange according to EN**EN 1092-1**

	Order code	DN	PN	ØD	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")	

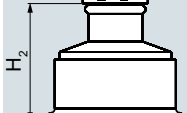
Flanges according to ASME**ASME B16.5**

	Order code	DN	PN	ØD	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")	

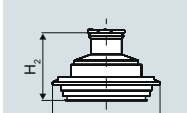
NuG and pharmaceutical connectionsConnections to DIN**DIN 11851 (milk pipe union with slotted union nut)**

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

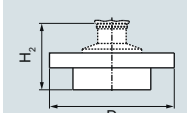
Tri-Clamp nach DIN 32676

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

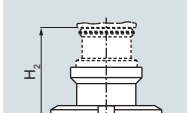
Other connections**Varivent connection**

	Order code	DN	PN	ØD	H ₂
	N28	40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

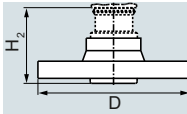
Sanitary process connection to DRD

	Order code	DN	PN	ØD	H ₂
	M32	50	40	105 mm (4.1")	Approx. 52 mm (2")

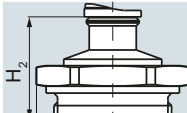
Sanitary process screw connection to NEUMO Bio-Connect

	Order code	DN	PN	ØD	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	ØD	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	ØD	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")

Pressure Measurement

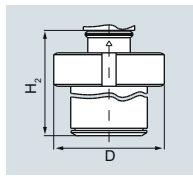
Pressure transmitters

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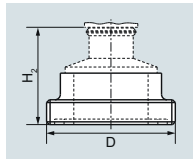
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Tank connection TG 52/50 and TG52/150



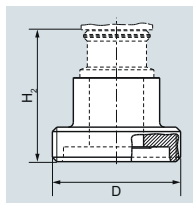
Order code	DN	PN	ØD	H ₂
R10	25	40	63 mm (2.5")	Approx. 63 mm (2.5")
R11	25	40	63 mm (2.5")	Approx. 170 mm (6.7")

SMS threaded socket



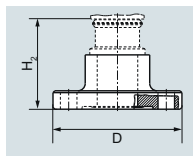
Order code	DN	PN	ØD	H ₂
M73	2"	25	70 x 1/6 mm	Approx. 52 mm (2")
M74	2½"	25	85 x 1/6 mm	
M75	3"	25	98 x 1/6 mm	

Aseptic threaded socket to DIN 11864-1 Form A



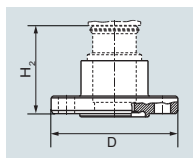
Order code	DN	PN	ØD	H ₂
N33	50	25	78 x 1/6"	Approx. 52 mm (2")
N34	65	25	95 x 1/6"	
N35	80	25	110 x ¼"	
N36	100	25	130 x ¼"	

Aseptic flange with notch to DIN 11864-2 Form A



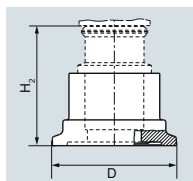
Order code	DN	PN	ØD	H ₂
N43	50	16	94	Approx. 52 mm (2")
N44	65	16	113	
N45	80	16	133	
N46	100	16	159	

Aseptic flange with groove to DIN 11864-2 Form A



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

Pressure Measurement

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SITRANS P300 Accessories/Spare parts

1

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 • plastic (blue)	7MF8997-1EA 7MF8997-1EB
Weldable sockets for PMC connection • PMC Style Standard: Thread 1½" • PMC Style Minibolt: front-flush 1"	7MF4997-2HA 7MF4997-2HB
Gaskets for PMC connection (packing unit = 5 units) • PTFE seal for PMC Style Standard: Thread 1½" • Gasket made of Viton for PMC Style Minibolt: front-flush 1"	7MF4997-2HC 7MF4997-2HD
Weldable socket for TG 52/50 and TG 52/150 connection • TG 52/50 connection • TG5 2/150 connection	7MF4997-2HE 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) • 1", class 150 (M40)	7MF4997-2HH 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) • on DVD (to order)	A5E03252406 A5E03252407
HART modem with USB interface	7MF4997-1DB

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

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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 gaskets made of PTFE between 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.

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

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

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

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

Selection and Ordering data

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



Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P300
7MF802-...1.-...
With process connection
female thread 1/2-14 NPT
in-sealed with PTFE sealing tape
Delivery incl. high-pressure test certified
by test report 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

Supplied acceptance test certificate to EN 10204- 3.1 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

SITRANS P300
7MF802-...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

A70

A71

A72

Delivery incl. high-pressure test certified
by test report to EN 10204-2.2

Further designs:

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)

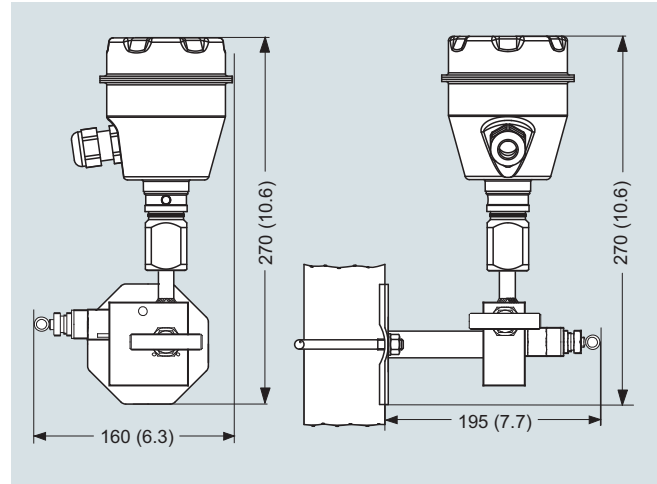
A02

Supplied acceptance test certificate to EN 10204- 3.1 for transmitters and mounted valve manifold

C12

Dimensional drawings**Valve manifolds mounted on SITRANS P300**

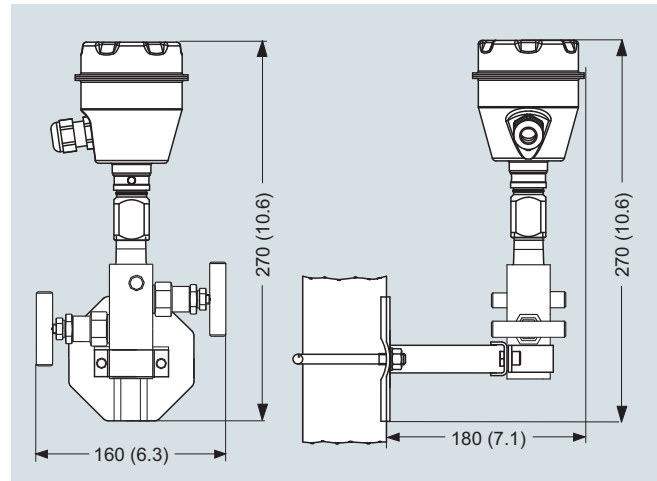
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters



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)

Pressure Measurement

Pressure transmitters
for gauge pressure for the paper industry

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SITRANS P DS III and P300 with PMC connection - Technical description

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 span 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 span 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.

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)

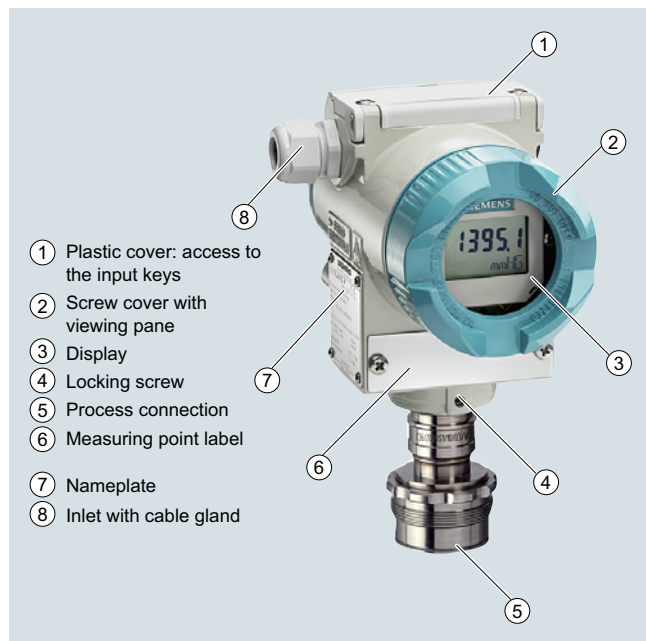
SITRANS P300

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.

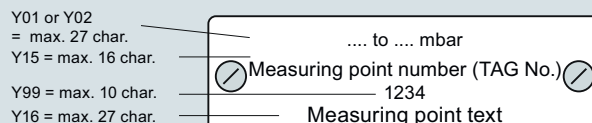
The rating plate (7, Figure "Device front view") with the Article No. is located on the side of the housing. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

The approval label is located on the opposite side.

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

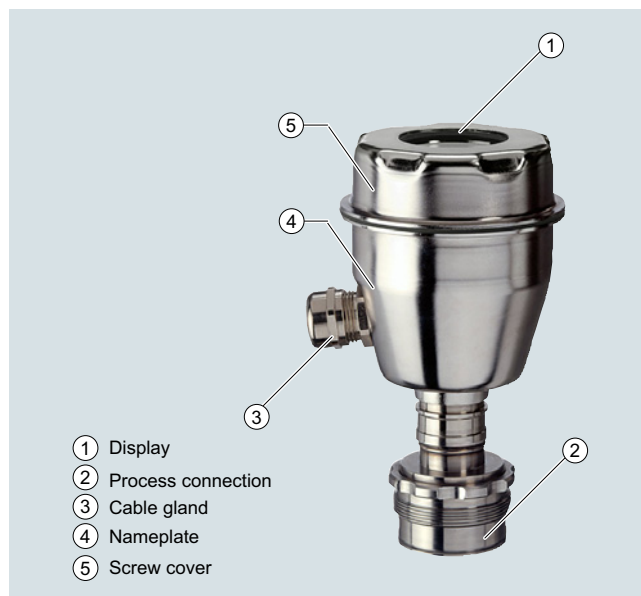
The electrical connections for the power supply and screen are accessible by unscrewing the rear cover. The bottom part of the housing contains the measuring cell with process connection (5). The measuring cell is prevented from rotating by a locking screw (4). As the result of this modular design, the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

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

Example for an attached measuring point label**SITRANS P300**

The device comprises:

- Electronics
- Housing
- Measuring cell



Perspective view of the SITRANS P300

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

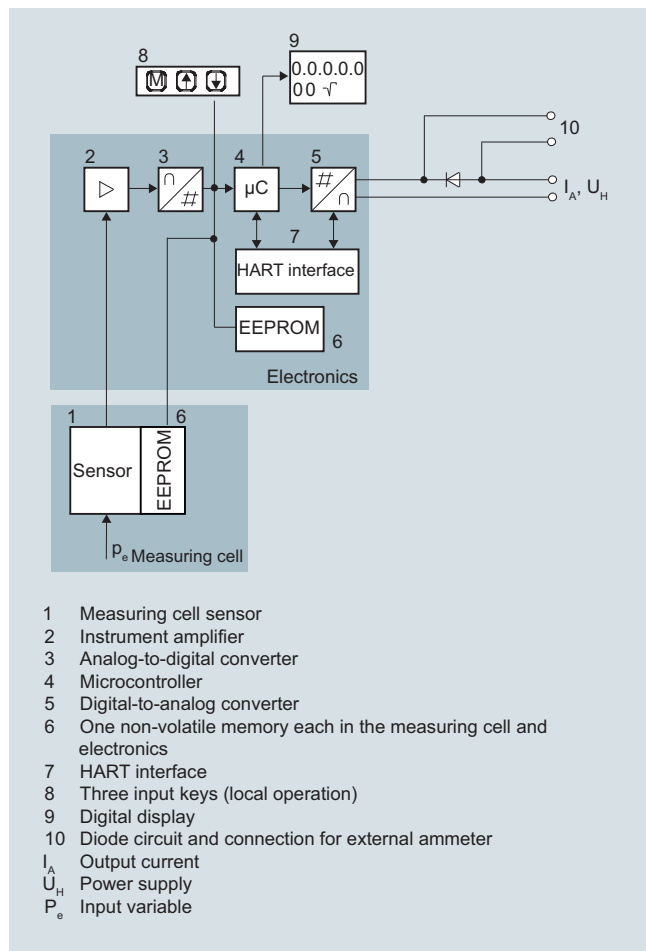
Pressure Measurement

Pressure transmitters
for gauge pressure for the paper industry

SITRANS P DS III and P300 with PMC connection - Technical description

Function

Operation of electronics with HART communication



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.

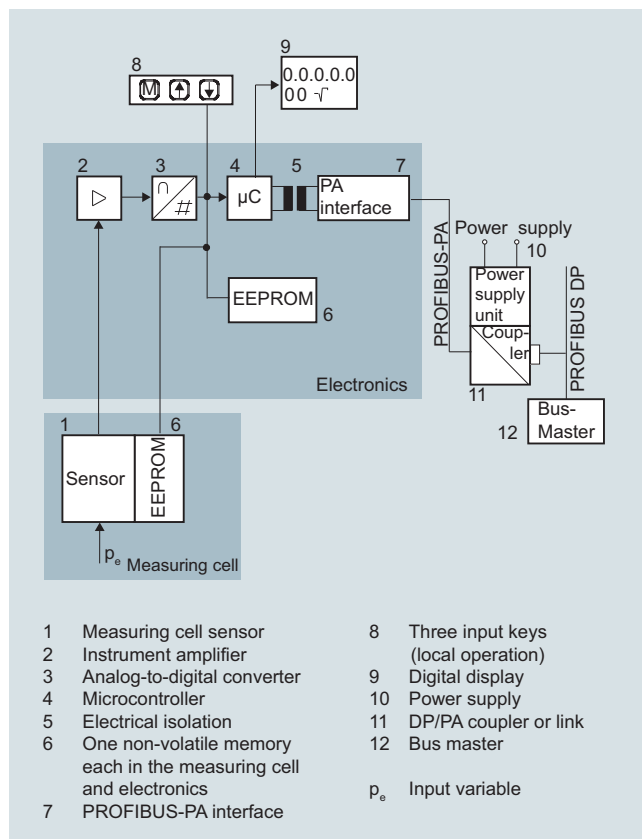
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced 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 spans ≤ 63 bar (914 psi) measure the input pressure compared to atmosphere, the transmitters with spans 160 bar (2320 psi) measure compared to vacuum.

Operation of electronics with PROFIBUS PA communication



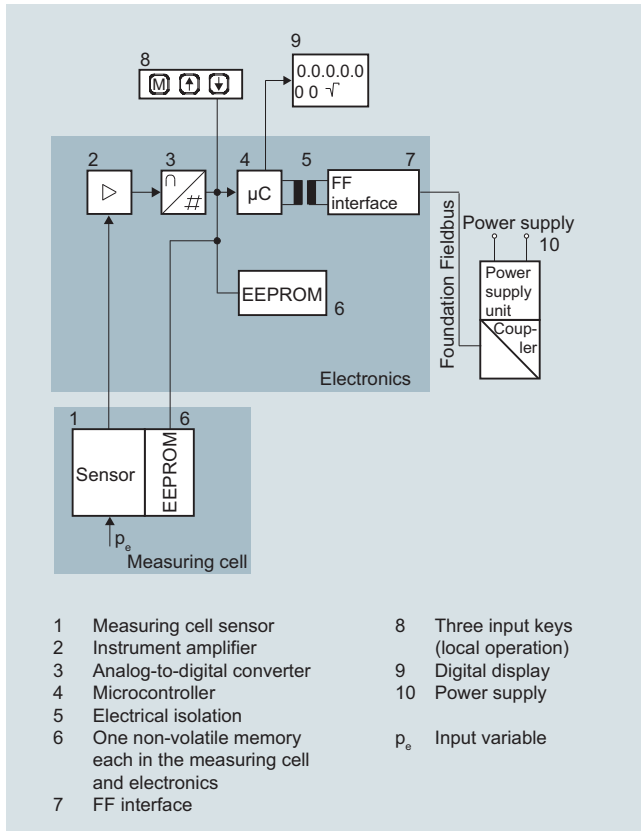
Function diagram of electronics

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

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).

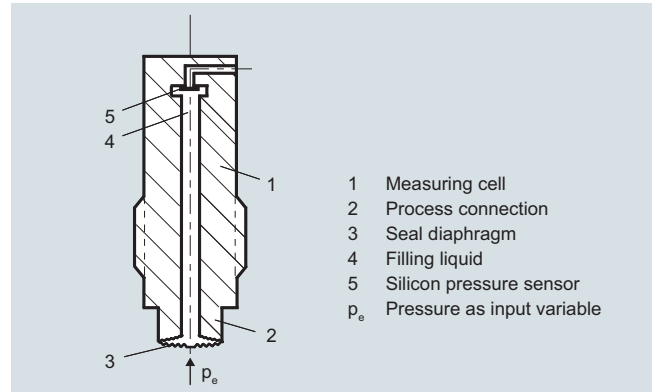
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

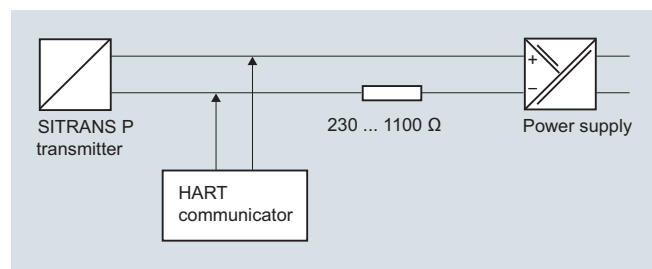
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

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

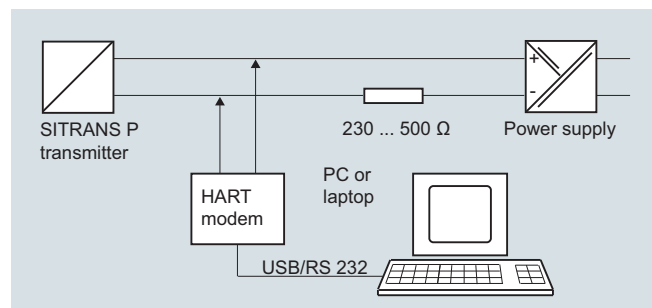
Parameterization using HART

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

Pressure Measurement

Pressure transmitters
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SITRANS P DS III and P300 with PMC connection - Technical description

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
Start of scale	x	x
Full-scale value	x	x
Electrical damping	x	x
Start-of-scale value without application of a pressure ("Blind setting")	x	x
Full-scale value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x ¹⁾
Type of dimension and actual dimension	x	x
Characteristic (linear)	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 O (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	%

Pressure Measurement

Pressure transmitters for gauge pressure for the paper industry

SITRANS P DS III with PMC connection

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Technical specifications

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

Input	Gauge pressure			
Measured variable	HART	PROFIBUS PA/ FOUNDATION Fieldbus		
Span (fully adjustable) or measuring range, max. operating pressure and max. test pressure	Span	Nominal measuring range	Max. operating pres- sure 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 span < 500 mbar adjustable)	100 mbar a/10 kPa a/1.45 psi a			
Upper measuring limit	100% of max. span			
Output	HART	PROFIBUS PA/ FOUNDATION Fieldbus		
Output signal	4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal		
• Lower limit (infinitely adjustable)	3.55 mA, factory preset to 3.84 mA	-		
• Upper limit (infinitely adjustable)	23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-		
Load				
• Without HART communication	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V	-		
• With HART communication	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART-Communicator)	-		
Physical bus	-	IEC 61158-2		
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 • Start-of-scale value 0 bar/kPa/psi • Stainless steel seal diaphragm • Silicone oil filling • Room temperature 25 °C (77 °F)			
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span or nom. pressure range			
Error in measurement at limit setting incl. hysteresis and reproducibility				
• Linear characteristic				
- 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 · 10 ⁻⁵ of nominal measuring range			

Pressure Measurement

Pressure transmitters
for gauge pressure for the paper industry

SITRANS P DS III with PMC connection

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SITRANS P, DS III series for gauge pressure with PMC connection for the paper industry		
	HART	PROFIBUS PA and FOUNDATION Fieldbus
Rated conditions		
Degree of protection		
• 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-AISI12 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 24 V power supply	-	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)	

Pressure Measurement

Pressure transmitters for gauge pressure for the paper industry

SITRANS P DS III with PMC connection

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HART communication		FOUNDATION Fieldbus communication	
HART communication	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
PROFIBUS PA communication		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- 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		

Pressure Measurement

Pressure transmitters
for gauge pressure for the paper industry

SITRANS P DS III with PMC connection

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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
0.16 ... 16 bar	(2.32 ... 232 psi)	D
Wetted parts materials		
Seal diaphragm	Connection shank	
Hastelloy	Stainless steel	B
Process connection		
<ul style="list-style-type: none"> PMC Style Standard: Thread 1½" PMC Style Minibolt: front-flush 1" (not with minimum span: 500 mbar (7.25 psi) - version "B") 		2 3
Non-wetted parts materials		
<ul style="list-style-type: none"> Housing made of die-cast aluminium Housing stainless steel precision casting 		0 3
Version		
<ul style="list-style-type: none"> Standard version, German plate inscription, setting for pressure unit: bar International version, English plate inscription, setting for pressure unit: bar Chinese version, English plate inscription, setting for pressure unit: Pascal 		1 2 3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
<ul style="list-style-type: none"> None With ATEX, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety (Ex ia)" "Explosion-proof (Ex d)"²⁾ „Ex nA/ic (Zone 2)"³⁾ FM + CSA intrinsic safe (is)⁴⁾ With FM + CSA, Type of protection: <ul style="list-style-type: none"> "Intrinsic Safe and Explosion Proof (is + xp)"³⁾⁴⁾ 		A B D E F NC
Electrical connection / cable entry		
<ul style="list-style-type: none"> Female thread M20 x 1.5 Female thread ½-14 NPT Device plugs M12 (stainless steel)^{5) 6)} 		B C F
Display		
<ul style="list-style-type: none"> Without display Without visible display (display concealed, setting: mA) With visible display (setting: mA) With customer-specific display (setting as specified, Order code "Y21" required) 		0 1 6 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) DS III with FOUNDATION Fieldbus (FF)		7MF4134 - 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 connection²⁾		
<ul style="list-style-type: none"> PMC Style Standard: Thread 1½" PMC Style Minibolt: front-flush 1" (minimum span: 500 mbar (7.25 psi), not available with 1-bar-measuring cell (Option B)) 		2 3
Non-wetted parts materials		
<ul style="list-style-type: none"> Housing made of die-cast aluminium Housing stainless steel precision casting 		0 3
Version		
<ul style="list-style-type: none"> Standard version, German plate inscription, setting for pressure unit: bar International version, English plate inscription, setting for pressure unit: bar Chinese version, English plate inscription, setting for pressure unit: Pascal 		1 2 3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
<ul style="list-style-type: none"> None With ATEX, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety (Ex ia)" "Explosion-proof (Ex d)"³⁾ „Ex nA/ic (Zone 2)"⁴⁾ FM + CSA intrinsic safe (is)⁵⁾ With FM + CSA, Type of protection: <ul style="list-style-type: none"> "Intrinsic Safe and Explosion Proof (is + xp)"³⁾⁵⁾ 		A B D E F NC
Electrical connection / cable entry		
<ul style="list-style-type: none"> Female thread M20 x 1.5 Female thread ½-14 NPT Device plugs M12 (stainless steel)^{6) 7)} 		B C F
Display		
<ul style="list-style-type: none"> Without display Without visible display (display concealed, setting: bar) With visible display (setting: bar) With customer-specific display (setting as specified, Order code "Y21" required) 		0 1 6 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

Pressure Measurement

Pressure transmitters

for gauge pressure for the paper industry

SITRANS P DS III with PMC connection

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Selection and Ordering data	Order code			
Further designs		HART	PA	FF
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 inH ₂ O and/or psi	B21	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1	C12	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	C14	✓	✓	✓
"Functional safety (SIL2)" 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	✓	✓	✓

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, 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 ₂ O ⁺ , inH ₂ O ⁺ , ftH ₂ O ⁺ , 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 units²⁾ 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)	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.

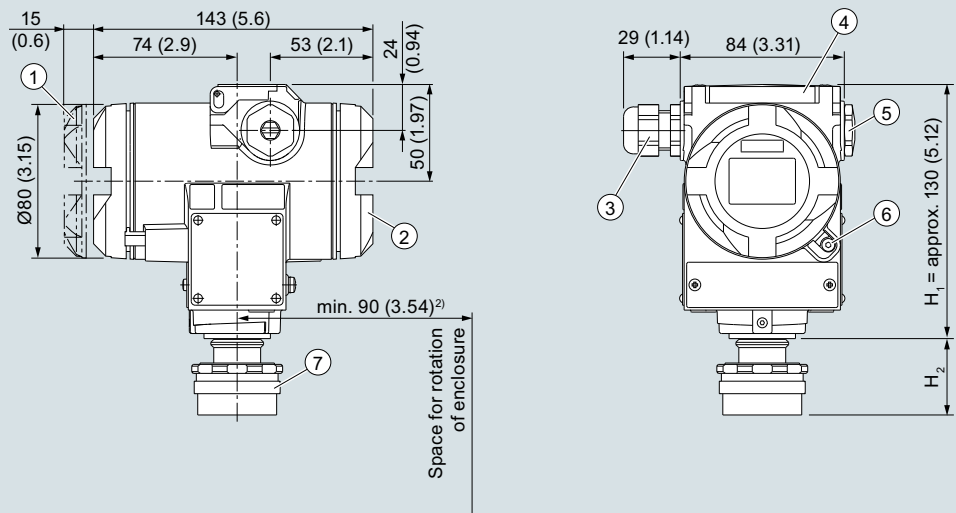
¹⁾ When the additional ex option is selected, the ATEX marking on the device is omitted. Only the Ex option selected via the Z option is marked.

Pressure Measurement

Pressure transmitters
for gauge pressure for the paper industry

SITRANS P DS III with PMC connection

Dimensional drawings



- ① Electronics side, local display
(longer overall length for cover with inspection window)¹⁾
- ② Connection side¹⁾
- 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

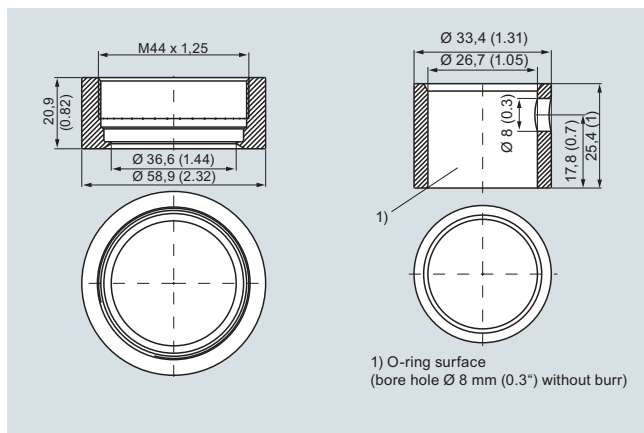
SITRANS P DS III pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

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

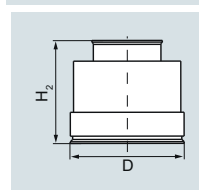
Only the height H_2 is indicated in the dimensions of the flanges.



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

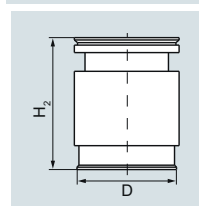
Material: Stainless steel, Mat. No. 1.4404/316L

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")

Pressure Measurement

Pressure transmitters for gauge pressure for the paper industry

SITRANS P300 with PMC connection

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Technical specifications

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

Input		Gauge pressure (front-flush)	
Measured variable			
Span (fully adjustable) or measuring range, max. operating pressure and max. test pressure	HART	PROFIBUS PA/ FOUNDATION Fieldbus	
	Span	Nominal measuring range	Max. operating pressure MAWP (PS)
	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
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	4 bar 400 kPa 58 psi	7 bar 0.7 MPa 102 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
Lower measuring limit (For PMC-Style Minibolt no span < 500 mbar adjustable)	100 mbar a/10 kPa a/1.45 psi a		
Upper measuring limit	100 % of max. span		
Output		HART	PROFIBUS PA/ FOUNDATION Fieldbus
Output signal		4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
• Lower limit (infinitely adjustable)		3.55 mA, factory preset to 3.84 mA	-
• Upper limit (infinitely adjustable)		23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-
Load			
• Without HART communication		$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω U_H : Power supply in V	-
• With HART communication		$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)	-
Physical bus		-	IEC 61158-2
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		<ul style="list-style-type: none"> Increasing characteristic Start-of-scale 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)		$r = \text{max. measuring span/set measuring span or nom. pressure range}$	
Error in measurement at limit setting incl. hysteresis and reproducibility			
Linear characteristic			
- $r \leq 5$		$\leq 0.075 \%$	
- $5 < r \leq 100$		$\leq (0.005 \cdot r + 0.05) \%$	
Influence of ambient temperature (in percent per 28 °C (50 °F))		$\leq (0.08 \cdot r + 0.16) \%$	
Long-term stability (temperature change $\pm 30 \text{ °C}$ ($\pm 54 \text{ °F}$))		$\leq (0.25 \cdot r) \%$ in 5 years	
Effect of mounting position		$\leq 0.1 \text{ mbar}/0.01 \text{ kPa}/0.00145 \text{ psi}$ 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	

Pressure Measurement

Pressure transmitters
for gauge pressure for the paper industry

SITRANS P300 with PMC connection

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

Rated conditions

Installation conditions

Ambient temperature

- Measuring cell with silicone oil
- Display readable
- Storage temperature

Climatic class

Condensation

Degree of protection

- according to EN 60529
- according to NEMA 250

Electromagnetic Compatibility

- Emitted interference and interference immunity

Medium conditions

Temperature of medium

- Measuring cell with silicone oil

Observe the temperature class in areas subject to explosion hazard.

-40 ... +85 °C (-40 ... +185 °F)

-30 ... +85 °C (-22 ... +185 °F)

-50 ... +85 °C (-58 ... +185 °F)

Relative humidity 0 ... 100 %

Condensation permissible, suitable for use in the tropics

IP65, IP68

Type 4X, enclosure cleaning, resistant to lyes, steam to 150 °C (302 °F)

Acc. to IEC 61326 and NAMUR NE 21

-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
- Measuring cell filling

Hastelloy C276, mat. no. 2.4819

Silicone oil

Surface quality touched-by-media

Ra-values ≤ 0.8 µm (32 µ inch)/welds Ra ≤ 1.6 µm (64 µ inch)

Power supply U_H

Terminal voltage on transmitter

HART

10.5 ... 42 V DC
for intrinsically safe operation:
10.5 ... 30 V DC

PROFIBUS PA/ FOUNDATION Fieldbus

Power supply

Supplied through bus

Separate power supply

-

Not necessary

Bus voltage

- Without Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Max. basic current
- Start-up current ≤ basic current
- Max. fault current in the event of a fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

Pressure Measurement

Pressure transmitters

for gauge pressure for the paper industry

SITRANS P300 with PMC connection

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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	PTB 05 ATEX 2048	
Intrinsic safety "i"	II 1/2 G Ex ia IIC/IIB T4/T5/T6 Ga/Gb	
Marking		
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: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	To certified intrinsically-safe circuits with peak values: FISCO supply unit: $U_i = 17.5 \text{ V}$, $I_i = 380 \text{ mA}$, $P_i = 5.32 \text{ W}$ Linear barrier: $U_i = 24 \text{ V}$, $I_i = 250 \text{ mA}$, $P_i = 1.2 \text{ W}$
Effective inner capacitance:	$C_i = 6 \text{ nF}$	$C_i = 1.1 \text{ nF}$
Effective internal inductance:	$L_i = 0.4 \text{ mH}$	$L_i \leq 7 \mu\text{H}$
Explosion protection to FM for USA <u>and</u> 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	

Pressure Measurement

Pressure transmitters
for gauge pressure for the paper industry

SITRANS P300 with PMC connection

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HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
PROFIBUS PA communication		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool Local operation (standard setting Address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	One measured value: 5 bytes Two measured values: 10 bytes	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	Register operating mode: 1 bytes Reset function due to metering. 1 bytes	• PID	1 resource block
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Function blocks	2	Transducer blocks	
• Analog input	Linearly rising or falling characteristic	• Pressure transducer block	
- Adaptation to customer-specific process variables	0 ... 100 s adjustable	- Can be calibrated by applying two pressures	Yes
- Electrical damping	Input /Output	- Monitoring of sensor limits	Yes
- Simulation function	One upper and lower warning limit and one alarm limit respectively	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- Limit monitoring	Can be reset and preset Optional direction of counting Simulation function of the register output		
• Register (totalizer)	One upper and lower warning limit and one alarm limit respectively		
- Limit monitoring	1		
• Physical block	2		
Transducer blocks			
• Pressure transducer block	Yes		
- Monitoring of sensor limits	Max. 31 nodes		
- Specification of a container characteristic with	Linear		
- Characteristic curve	Available		
- Simulation function			
• Transducer block "Electronic temperature"			
Simulation function	Available		



Pressure Measurement

Pressure transmitters

for gauge pressure for the paper industry

SITRANS P300 with PMC connection

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Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
SITRANS P300 pressure transmitters with PMC connection , single-chamber measuring housing, rating plate inscription in English			SITRANS P300 pressure transmitters with PMC connection , single-chamber measuring housing, rating plate inscription in English		
with 4 ... 20 mA / HART		7 MF 8 1 2 3 -	with 4 ... 20 mA / HART		7 MF 8 1 2 3 -
with PROFIBUS PA		7 MF 8 1 2 4 -	with PROFIBUS PA		7 MF 8 1 2 4 -
with FOUNDATION Fieldbus (FF)		7 MF 8 1 2 5 -	with FOUNDATION Fieldbus (FF)		7 MF 8 1 2 5 -
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Measuring cell filling	Measuring cell cleaning		Display		
Silicone oil	normal	1	• Without display, with keys, closed lid		1
Inert liquid	Cleanliness level 2 to DIN 25410	3	• With display and keys, closed lid ⁷⁾		2
Measuring span			• With display and keys, lid with polycarbonate disc (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure units) ⁷⁾		4
1 bar ¹⁾	(14.5 psi)	B	• With display and keys (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with polycarbonate disc ⁷⁾		5
4 bar	(58 psi)	C	• With display and keys, lid with glass pane (setting on HART devices: mA, with PROFIBUS PA and FOUNDATION Fieldbus equipment: pressure unit) ⁷⁾		6
16 bar	(232 psi)	D	• With display (setting acc. to specifications, Order code "Y21" or "Y22" required), lid with glass pane ⁷⁾		7
Wetted parts materials			Power supply units see Chap. 7 "Supplementary Components".		
Seal diaphragm	Measuring cell		Included in delivery of the device:		
Hastelloy	Stainless steel	B	• Quick-start guide		
Process connection			• Sealing ring		
• PMC Style Standard: Thread 1½"		2	1) Only with "Standard" process connection"		
• PMC Style Minibolt: front-flush 1" (minimum span: 500 mbar (7.25 psi), not available with 1-bar-measuring cell (Option B))		3	2) Not in conjunction with electrical connection option A.		
Non-wetted parts materials			3) Only available together with electrical connection options B, C or G.		
• Stainless steel, deep-drawn and electrolytically polished		4	4) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
Version			5) Only together with HART electronics.		
• Standard versions		1	6) Without cable gland.		
Explosion protection			7) Display cannot be turned.		
• 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			

Pressure Measurement

Pressure transmitters
for gauge pressure for the paper industry

SITRANS P300 with PMC connection

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Selection and Ordering data	Order code			
Further designs		HART	PA	FF
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	B21	✓	✓	✓
Pressure units in inH ₂ O and/or psi				
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1	C12	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	C14	✓	✓	✓
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	✓	✓	✓

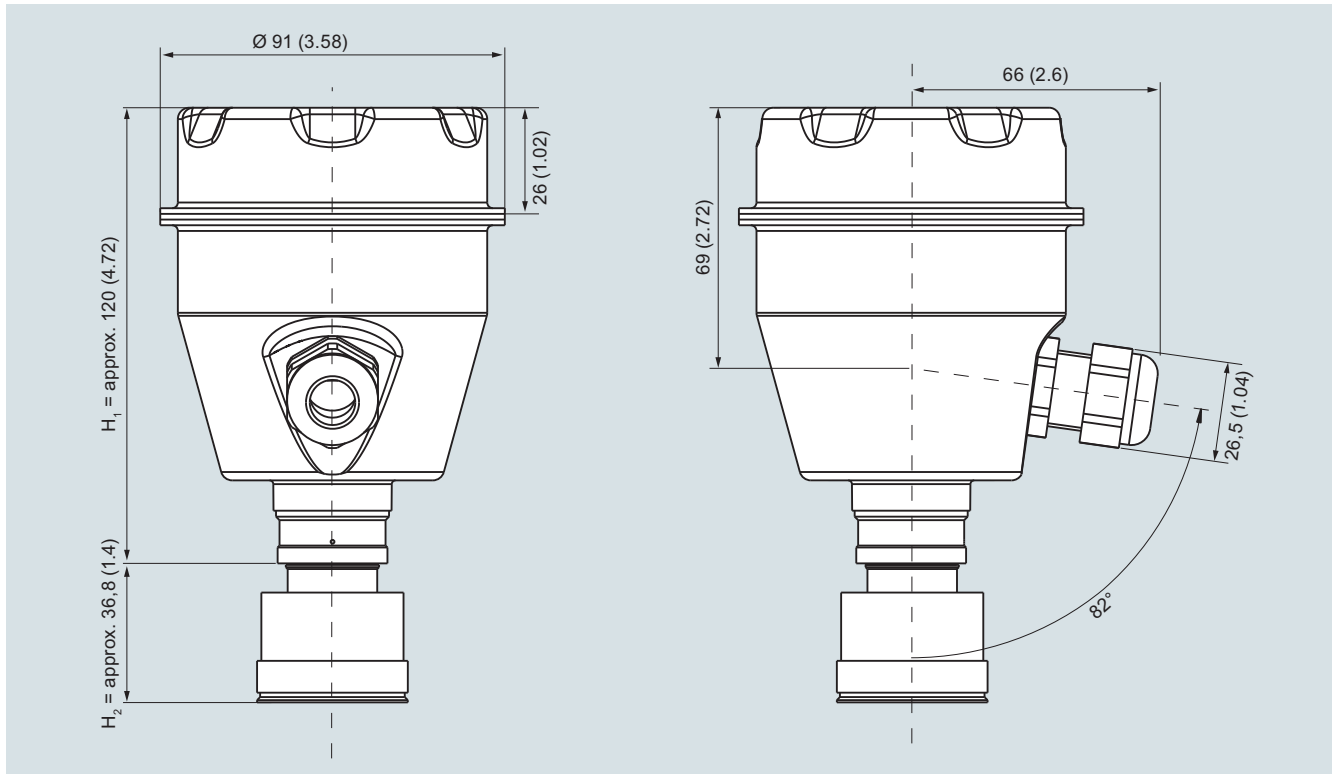
Selection and Ordering data	Order code			
Additional data		HART	PA	FF
Please add "-Z" to Article No. and specify Order code(s) and plain text.				
Measuring range to be set	Y01	✓	✓ ¹⁾	
Specify in plain text (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi				
Stainless steel tag plate 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 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 ₂ O [*] , inH ₂ O [*] , ftH ₂ O [*] , 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 units²⁾	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	Y25		✓	✓
possible between 1 and 126 Specify in plain text: 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



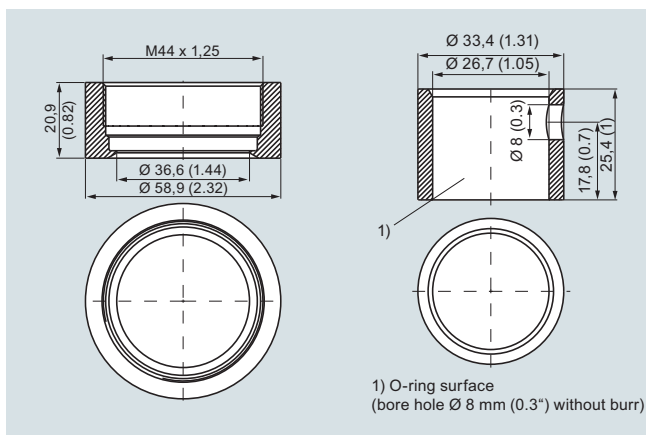
SITRANS P300 pressure transmitters for gauge pressure, with PMC connection, dimensions in mm (inch)

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

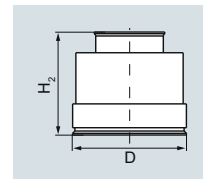
Only the height H_2 is indicated in the dimensions of the flanges.



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

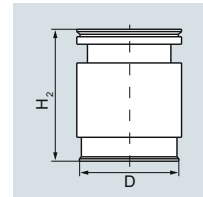
Material: Stainless steel, mat. No. 1.4404 / 316L

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")

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

Technical description

1

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 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.

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.

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 $q \sim \sqrt{\Delta p}$ (together with a primary differential pressure transducer (see section "Flow meters"))

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.

Span (infinitely adjustable)

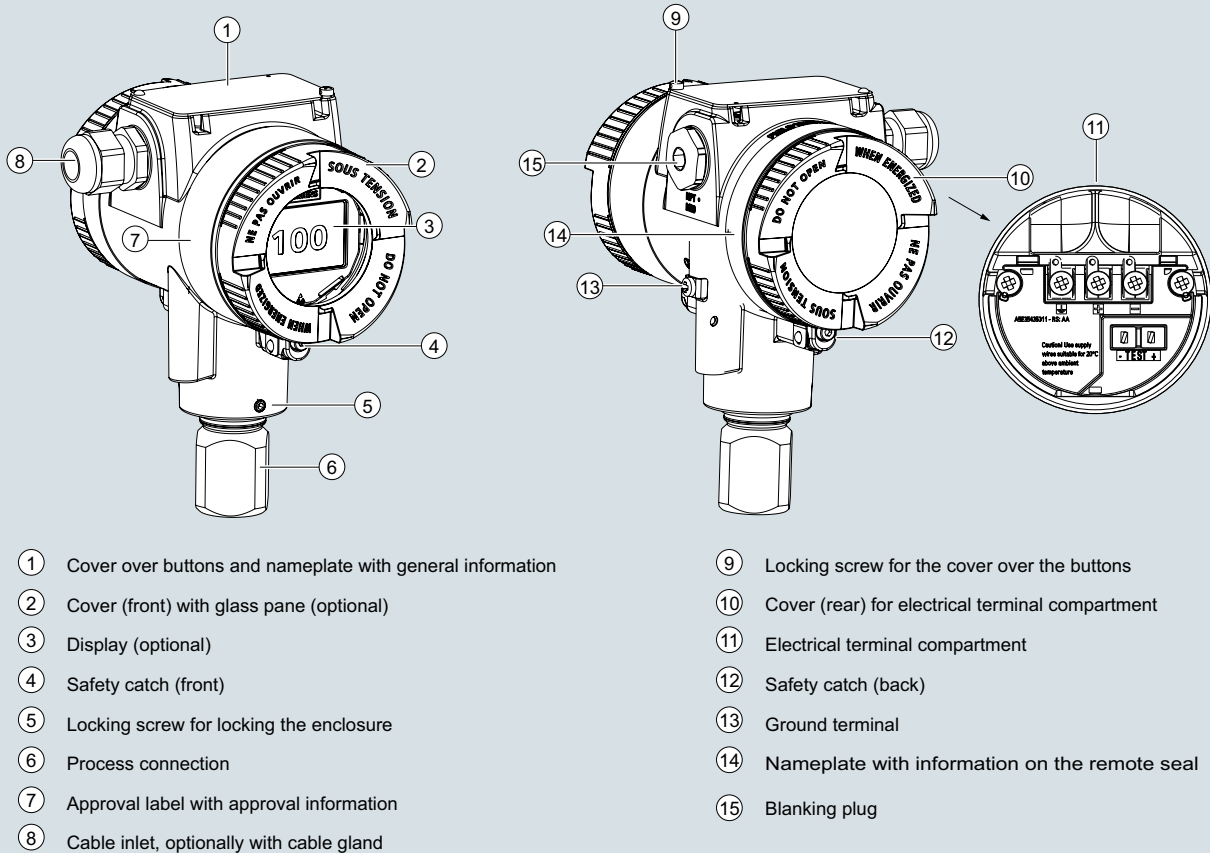
- For SITRANS P320/P420 with HART: 25 mbar to 5 bar (0.363 to 72.5 psi)

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.

**Device front view**

- The electronics enclosure is made of die cast aluminum or precision cast stainless steel.
- The housing 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.

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

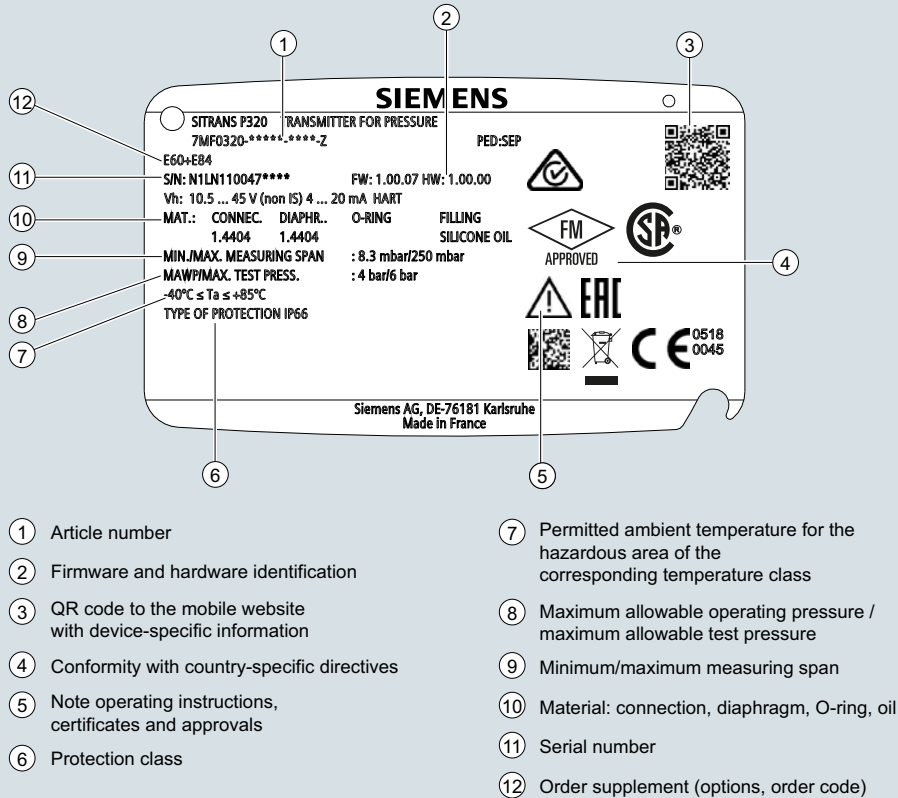
SITRANS P320/P420

Technical description

Nameplates

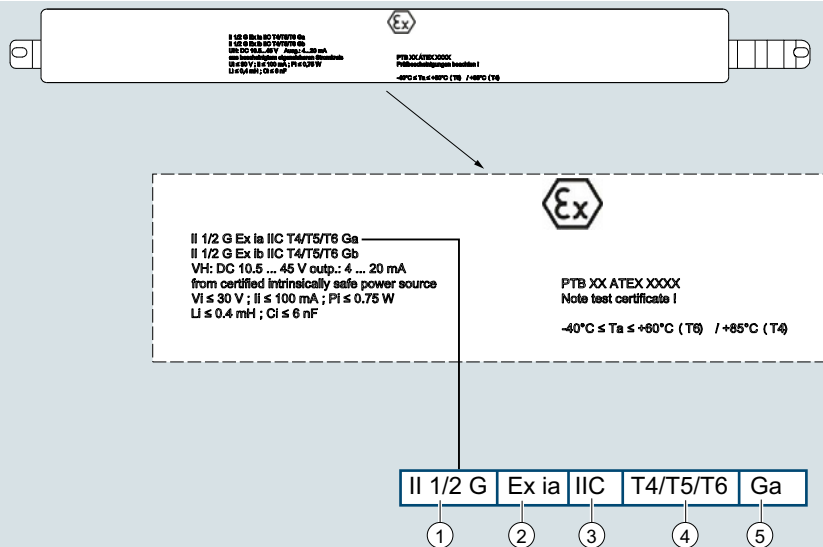
Nameplate

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.



Approval label with approval information

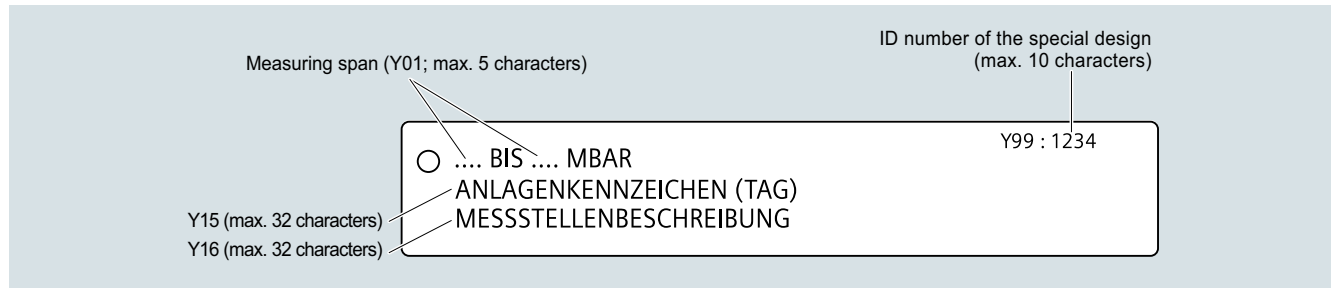
The approval label with approval information is located on the front of the enclosure.



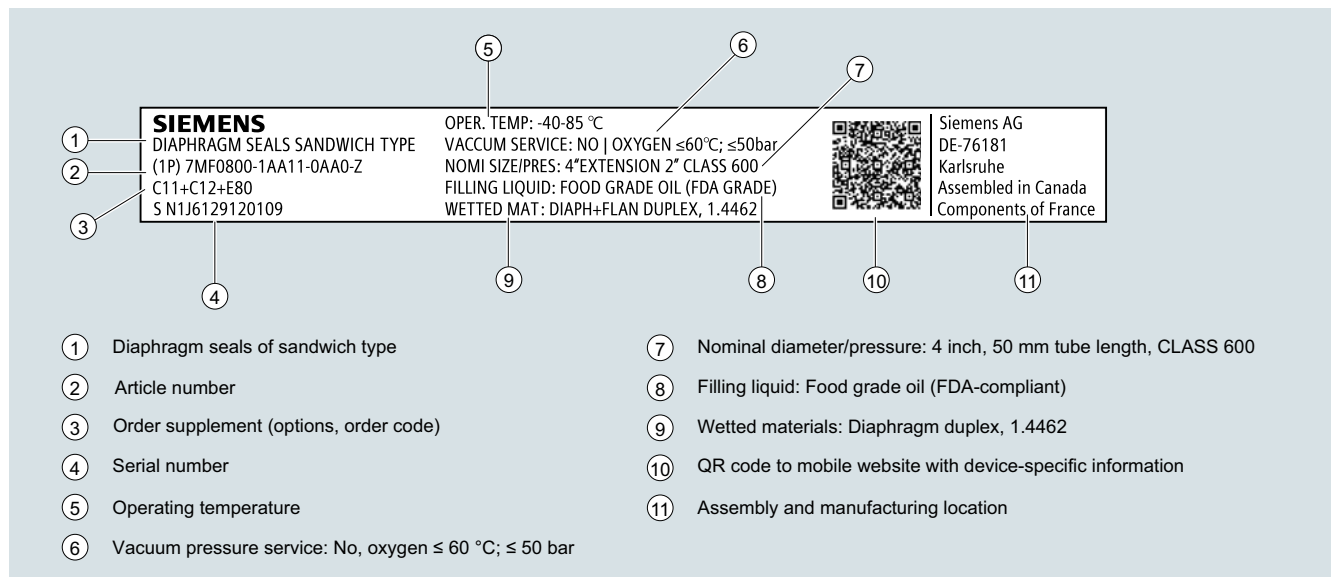
- ① Characteristics of the hazardous area
- ② Type of protection
- ③ Group (gas, dust)
- ④ Maximum surface temperature (temperature class)
- ⑤ Device protection level

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.



Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

Technical description

1

Function

Adjustable parameters and diagnostics

SITRANS P320/P420 with HART communication

Parameters	Input buttons	SITRANS P320	SITRANS P420
Application, measurement type	x	x	x
Adjusting start of scale value/full scale value	x	x	x
Setting start of scale value/full scale 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 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
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 , NI
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, NI/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		
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/process temperature)	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	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.		
• Low measuring limit	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	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with FDA-compliant oil	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/process temperature)		
• Upper measuring limit	Between the measuring limits (infinitely adjustable)		
• Start of scale			

Output

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	$R = (U_H - 10.5 \text{ V}) / 22.8 \text{ mA}$, U_H : Power supply in V
• With HART communication	$R = 230 \dots 1100 \Omega$ (HART communicator (handheld)) $R = 230 \dots 500 \Omega$ (SIMATIC PDM)
Characteristic curve	<ul style="list-style-type: none"> • 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	-

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

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
- Start of scale 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)

- Linear characteristic
- 250 mbar/25 kPa/3.6 psi

r = max. measuring span/set measuring span and nominal measuring range

$r \leq 1.25$: $\leq 0.075\%$ (SITRANS P320)
 $\leq 0.065\%$ (SITRANS P420)

$1.25 < r \leq 30$: $\leq (0.008 \cdot r + 0.055)\%$
 $r \leq 5$: $\leq 0.065\%$ (SITRANS P320)
 $\leq 0.04\%$ (SITRANS P420)

$5 < r \leq 100$: $\leq (0.004 \cdot r + 0.045)\%$

$r \leq 3$: $\leq 0.075\%$ (SITRANS P320)
 $3 < r \leq 100$: $\leq (0.005 \cdot r + 0.05)\%$ (SITRANS P320)

$r \leq 5$: $\leq 0.075\%$ (SITRANS P420)
 $5 < r \leq 100$: $\leq (0.005 \cdot r + 0.05)\%$ (SITRANS P420)

Influence of ambient temperature
in % per 28 °C (50 °F)

- 250 mbar/25 kPa/3.6 psi
- 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
- 700 bar/70 MPa/10152 psi

$\leq (0.16 \cdot r + 0.1)\%$
 $\leq (0.05 \cdot r + 0.1)\%$
 $\leq (0.025 \cdot r + 0.125)\%$

$\leq (0.08 \cdot r + 0.16)\%$

Long-term stability at ± 30 °C (± 54 °F)

- 250 mbar/25 kPa/3.6 psi
- 1 bar/100 kPa/14.5 psi

$\leq (0.25 \cdot r)\%$ per year
In 5 years $\leq (0.25 \cdot r)\%$
In 10 years $\leq (0.35 \cdot r)\%$
In 5 years $\leq (0.125 \cdot r)\%$
In 10 years $\leq (0.15 \cdot r)\%$

- 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
- 700 bar/70 MPa/10152 psi

In 5 years $\leq (0.25 \cdot r)\%$
In 10 years $\leq (0.35 \cdot r)\%$

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)**Rated 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 -40 ... +100 °C (-40 ... +212 °F)
 - 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 -20 ... +100 °C (-4 ... +212 °F)
 - 400 bar/40 MPa/5802 psi
 - 700 bar/70 MPa/10152 psi
- 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: -40 ... +85 °C (-40 ... +185 °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
 - 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 housing
 - 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 1/2-14 NPT
- Male thread M20 x 1.5 and 1/2-14 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 1/2-14 NPT

Electrical connection

Cable entry via the following screwed glands:

- M20 x 1.5
- 1/2-14 NPT
- Device plug Han 7D/Han 8D¹⁾
- 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)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge pressure (pressure series)

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	$U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)
Noise	$U_{eff} \leq 1.2 \text{ mV}$ (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)
- ACS (France)
- NSF (USA)

No.: 1903094 (option E83)
No.: 18 ACC LY 277 (option E85)
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
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
-40 ... +80 °C (-40 ... +176 °F) temperature class T4
-40 ... +55 °C (-40 ... +131 °F) temperature class T6
-40 ... +100 °C (-40 ... +212 °F) temperature class T4
-40 ... +70 °C (-40 ... +158 °F) temperature class T6
To certified intrinsically safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$
 $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$
 $L_i = 0.24 \mu\text{H}/C_i = 3.29 \text{ nF}$

- Effective internal inductance/capacitance

- Flameproof enclosure "d"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
-40 ... +80 °C (-40 ... +176 °F) temperature class T4
-40 ... +70 °C (-40 ... +158 °F) temperature class T6
-40 ... +100 °C (-40 ... +212 °F) temperature class T4
-40 ... +70 °C (-40 ... +158 °F) temperature class T6
To a circuit with the operating values:
 $U_n = 10.5 \text{ to } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

- Dust explosion protection for zones 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Max. surface temperature
- Connection

Ex II 2D Ex tb IIIC T120 °C Db
Ex II 3D Ex tc IIIC T120 °C Dc
-40 ... +80 °C (-40 ... +176 °F)
-40 ... +100 °C (-40 ... +212 °F)
120 °C (248 °F)
To a circuit with the operating values:
 $U_n = 10.5 \text{ to } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

- Dust explosion protection for zones 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

Ex II 1D Ex ia IIIC T120 °C Da
Ex II 2D Ex ib IIIC T120 °C Db
Ex II 3D Ex ic IIIC T120 °C Dc
-40 ... +80 °C (-40 ... +176 °F)
-40 ... +100 °C (-40 ... +212 °F)
To certified intrinsically safe circuits with the peak values:
 $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$
 $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$
 $L_i = 0.24 \mu\text{H}/C_i = 3.29 \text{ nF}$

- Effective internal inductance/capacitance

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

<ul style="list-style-type: none"> Type of protection for Zone 2 <ul style="list-style-type: none"> - Marking - Permissible ambient temperature "ec" - Permissible ambient temperature "ic" - Permissible temperature of measuring medium - "ec" connection - "ic" connection 	<p>Ex II 3G Ex ec IIC T4/T6 Gc Ex II 3G Ex ic IIC T4/T6 Gc</p> <p>-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6 -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +80 °C (-40 ... +176 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>To a circuit with the operating values: $U_n = 10.5$ to 30 V, 4 ... 20 mA 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</p> <p>Effective internal inductance/capacitance: $L_i = 0.24$ μH/$C_i = 3.29$ nF Available soon</p> <p>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 Available soon</p> <p>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</p>
<ul style="list-style-type: none"> Explosion protection acc. to FM <ul style="list-style-type: none"> - Marking (XP/DIP) or IS; NI; S Explosion protection according to CSA <ul style="list-style-type: none"> - Marking (XP/DIP) or (IS) 	<p>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</p>
<p>NAMUR recommendations</p> <ul style="list-style-type: none"> NE 06 NE 21 NE 23 NE 43 NE 53 NE 80 NE 105 NE 107 NE 131 	<p>Standardized Electrical Signals and Questions Relating to Engineering Technology Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment Extra Low Voltage Circuits with Safe Separation Standardization of the Signal Level for the Failure Information of Digital Transmitters Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics The Application of the Pressure Equipment Directive to Process Control Devices Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices Self-Monitoring and Diagnosis of Field Devices NAMUR Standard Device - Field Devices for Standard Applications</p>

¹⁾ Han 8D is identical to Han 8U.

HART communication

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge pressure (pressure series)

1

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

Measuring cell filling

Silicone oil

Inert liquid

Neobee oil

Maximum measuring span

250 mbar (3.6 psi)

1000 mbar (14.5 psi)

4000 mbar (58 psi)

16 bar (232 psi)

63 bar (914 psi)

160 bar (2321 psi)

400 bar (5802 psi)

700 bar (10153 psi)

Process connection

Male thread M20 x 1.5

Male thread G½ (DIN EN 837-1)

Female thread ½-14 NPT

Male thread ½-14 NPT

Oval flange, mounting thread: 7/16-20 UNF (IEC 61518)

Oval flange, mounting thread: M10 (DIN 19213)

Oval flange, mounting thread: M12 (DIN 19213)

Version for diaphragm seal pressure

Wetted parts materials: Process connection, seal diaphragm

Stainless steel 316L/1.4404, stainless steel 316L/1.4404

Stainless steel 316L/1.4404, alloy C276/2.4819

Alloy C22/2.4602, alloy C276/2.4819

Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

Enclosure

Dual chamber device

Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

Combination of options B, C and L (zone model)

Combination of options B, C and M (zone model, Class DCable gland must be ordered separately as option (Axx)vision)

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

Local operation/display

Without display (cover closed)

With display (cover closed)

With display (cover with glass pane)

0

1

3

4

F

J

N

Q

T

V

W

X

B

D

E

F

G

H

J

U

0

1

2

1

2

5

A

B

C

D

L

M

S

T

F

M

0

1

2

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P320/P420

for gauge pressure (pressure series)

1

Selection and ordering data

Options	Order code	Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.		Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included		Device options	
Plastic	A00	PDF file with device settings	D10
Metal	A01	Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	D20
Stainless steel	A02	FVMQ enclosure sealing	D21
Stainless steel 316L/1.4404	A03	IP66/IP68 degree of protection (not for device plugs M12 and Han)	D30
CMP, for XP devices	A10	TAG label empty	D40
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11	Without labeling of the measuring range on the TAG label	D41
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12	Stainless steel Ex plate 1.4404/316L	D42
Device plug Han mounted left		Overvoltage protection up to 6 kV (external)	D71
Device plug Han 7D (plastic, straight)	A30	Adhesive labels on transport packaging (supplied by customer)	D90
Device plug Han 7D (plastic, angled)	A31		
Device plug Han 7D (metal, straight)	A32	General approval without Ex approval	
Device plug Han 7D (metal, angled)	A33	Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Device plug Han 8D (plastic, straight)	A34	Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
Device plug Han 8D (plastic, angled)	A35	CSA (USA and Canada)	E06
Device plug Han 8D (metal, straight)	A36	EAC	E07
Device plug Han 8D (metal, angled)	A37	FM	E08
Cable socket included		KCC	E09
Plastic, for device plug Han 7D and Han 8D	A40	Export approval CPA (China)	E12
Metal, for device plug Han 7D and Han 8D	A41	Explosion protection approvals	
Device plug M12 mounted left		ATEX (Europe)	E20
Stainless steel, without cable socket	A62	CSA (USA and Canada)	E21
Stainless steel, with cable socket	A63	FM (USA and Canada)	E22
Cable entry/connector mounting		IECEX (Worldwide)	E23
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90	EACEx (GOST-R, -K, -B)	E24
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91	INMETRO (Brazil)	E25
Cable gland/connector mounted left	A97	KCs (Korea)	E26
Cable gland/connector mounted on right	A99	NEPSI (China)	E27
Nameplate labeling (standard labeling: English, unit bar)		PESO (India)	E28
German (bar)	B11	UKR Sepro (Ukraine)	E30
French (bar)	B12	ATEX (Europe) and IECEX (Worldwide)	E47
Spanish (bar)	B13	CSA (Canada) and FM (USA)	E48
Italian (bar)	B14	ATEX (Europe) and IECEX (Worldwide) + CSA (Canada) and FM (USA)	E49
Chinese (bar)	B15	Marine approvals	
Russian (bar)	B16	DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
English (psi)	B20	LR (Lloyds Register)	E51
English (Pa)	B30	BV (Bureau Veritas)	E52
Chinese (Pa)	B35	ABS (American Bureau of Shipping)	E53
Certificates		RMR (Russian Maritime Register)	E55
Quality test certificate, 5-point factory calibration (IEC 60770-2)	C11	KR (Korean Register of Shipping)	E56
Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12	RINA (Registro Italiano Navale)	E57
Test report - NACE (MR 0103-2012 and MR 0175-2009)	C13	CCS (China Classification Society)	E58
Test report (EN 10204-2.2) - Wetted parts	C14	Country-specific approvals	
Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15	CRN approval Canada (Canadian Registration Number)	E60
Certificates for functional safety		Special approvals	
Functional safety (IEC 61508) - SIL2/3	C20	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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

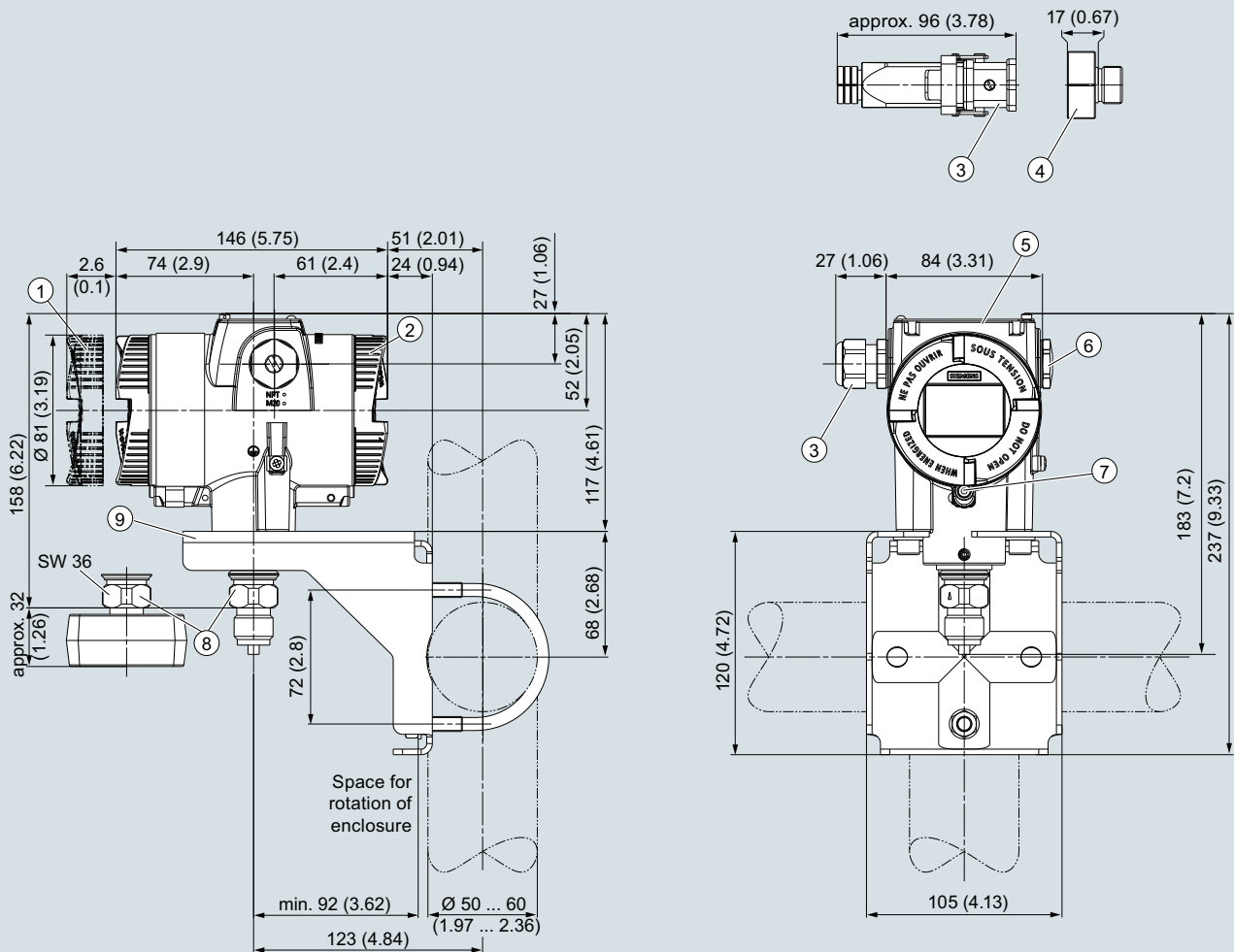
SITRANS P320/P420

for gauge pressure (pressure series)

1

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 test report (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 test report (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 test report (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 test report (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	Y01
Start of scale value (max. 5 characters), full scale 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/cm², kg/cm², kgf/cm², inH₂O, inH₂O (4°C), ftH₂O, mmH₂O, mmH₂O (4°C), mH₂O (4°C), mmHg, inHg, atm, torr	
TAG	Y15
(on stainless steel plate and device parameters, max. 32 characters)	
Input field: Free text, max. 32 characters	
Measuring point description	Y16
(on stainless steel plate and device parameters, max. 32 characters)	
Input field: Free text, max. 32 characters	
TAG short	Y17
(device parameters, max. 8 characters)	
Input field: Free text, max. 8 characters	
Local display	Y21
[Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge	
Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	
Local display	Y22
Scaling with standard units	
[m³/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, m³, l, hl, in³, ft³, yd³, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm³, NI.	
Local display	Y23
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	
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	Y30
Drop-down list 1: 3.9, 4	
Drop-down list 2: 20.8, 22	
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	Y31
Drop-down list: 3.75; 21.75; 22.5; 22.6	
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	Y32
Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	
ID number of special version	Y99
Input field: max. 4 characters and only natural numbers from 0 ... 9999	

Dimensional drawings

① Electronics side, local display
(longer overall length for cover with glass pane)¹⁾

② Connection side

③ Electrical connection:
 • M20 x 1,5³⁾ 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)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge pressure (differential pressure series)

Technical specifications

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

Input

Measured variable

Gauge pressure

Span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)

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 inH₂O

2320 psi

3481 psi

1 ... 60 mbar

160 bar

240 bar

0.1 ... 6 kPa

16 MPa

24 MPa

0.4019 ... 24.11 inH₂O

2320 psi

3481 psi

2.5 ... 250 mbar

160 bar

240 bar

0.2 ... 25 kPa

16 MPa

24 MPa

1.005 ... 100.5 inH₂O

2320 psi

3481 psi

6 ... 600 mbar

160 bar

240 bar

0.6 ... 60 kPa

16 MPa

24 MPa

2.41 ... 241.1 inH₂O

2320 psi

3481 psi

16 ... 1600 mbar

160 bar

240 bar

1.6 ... 160 kPa

16 MPa

24 MPa

6.43 ... 643 inH₂O

2320 psi

3481 psi

50 ... 5000 mbar

160 bar

240 bar

5 ... 500 kPa

16 MPa

24 MPa

20.09 ... 2009 inH₂O

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

- Measuring cell with inert oil

- Measuring cell with FDA-compliant oil

• Upper measuring limit

30 mbar a/3 kPa a/0.44 psi a

30 mbar a/3 kPa a/0.44 psi a

100 mbar a/10 kPa a/1.45 psi a

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

Between the measuring limits (infinitely adjustable)

• Start of scale

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

$R = (U_H - 10.5 \text{ V}) / 22.8 \text{ mA}$,

U_H : Power supply in V

• With HART communication

$R = 230 \dots 1100 \Omega$ (HART communicator (handheld))

$R = 230 \dots 500 \Omega$ (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
- Start of scale 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)

- Linear characteristic

- 20 mbar/2 kPa/8.031 inH₂O

- 60 mbar/6 kPa/24.09 inH₂O

- 250 mbar/25 kPa/3.6 psi
600 mbar/60 kPa/240.9 inH₂O
1600 mbar/160 kPa/642.4 inH₂O
5000 mbar/500 kPa/2008 inH₂O
30 bar/3 MPa/435 psi

- 100 bar/10 MPa/1450 psi

Influence of ambient temperature as % per 28 °C (50 °F)

- 20 mbar/2 kPa/8.031 inH₂O
- 60 mbar/6 kPa/24.09 inH₂O
- 250 mbar/25 kPa/3.6 psi
600 mbar/60 kPa/240.9 inH₂O
1600 mbar/160 kPa/642.4 inH₂O
5000 mbar/500 kPa/2008 inH₂O
30 bar/3 MPa/435 psi

- 250 mbar/25 kPa/3.6 psi
5000 mbar/500 kPa/2008 inH₂O
- 600 mbar/60 kPa/240.9 inH₂O
1600 mbar/160 kPa/642.4 inH₂O
30 bar/3 MPa/435 psi

- 100 bar/10 MPa/1450 psi

Long-term stability at ±30 °C (±54 °F)

- 20 mbar/2 kPa/8.031 inH₂O
- 60 mbar/6 kPa/24.09 inH₂O
- 250 mbar/25 kPa/3.6 psi
600 mbar/60 kPa/240.9 inH₂O
1600 mbar/160 kPa/642.4 inH₂O
5000 mbar/500 kPa/2008 inH₂O
- 30 bar/3 MPa/435 psi

- 100 bar/10 MPa/1450 psi

Step response time T_{63} (without electrical damping)

- 20 mbar/2 kPa/8.031 inH₂O
- 60 mbar/6 kPa/24.09 inH₂O
- 250 mbar/25 kPa/3.6 psi
600 mbar/60 kPa/240.9 inH₂O
1600 mbar/160 kPa/642.4 inH₂O
5000 mbar/500 kPa/2008 inH₂O
30 bar/3 MPa/435 psi
- 100 bar/10 MPa/1450 psi

Effect of mounting position (in pressure per change of angle)

Effect of auxiliary power (in % per voltage change)

r = max. measuring span/set measuring span and nominal measuring range

$r \leq 5$:	$\leq 0.075\%$
$5 < r \leq 20$:	$\leq (0.005 \cdot r + 0.05)\%$
$r \leq 5$:	$\leq 0.075\%$
$5 < r \leq 60$:	$\leq (0.005 \cdot r + 0.05)\%$
$r \leq 5$:	$\leq 0.065\%$ (SITRANS P320)
	$\leq 0.04\%$ (SITRANS P420)
$5 < r \leq 100$:	$\leq (0.004 \cdot r + 0.045)\%$
$r < 10$:	$= 0.1\%$
$10 < r < 30$:	$= 0.2\%$

$\leq (0.15 \cdot r + 0.1)\%$
 $\leq (0.075 \cdot r + 0.1)\%$
 $\leq (0.025 \cdot r + 0.125)\%$ (SITRANS P320)

$\leq (0.025 \cdot r + 0.0625)\%$ (SITRANS P420)

$\leq (0.0125 \cdot r + 0.0625)\%$ (SITRANS P420)

$0.08 \cdot r + 0.16\%$

$\leq (0.2 \cdot r)\%$ per year
 In 5 years $\leq (0.25 \cdot r)\%$
 In 5 years $\leq (0.125 \cdot r)\%$
 In 10 years $\leq (0.15 \cdot r)\%$

In 5 years $\leq (0.25 \cdot r)\%$
 In 10 years $\leq (0.35 \cdot r)\%$
 In 5 years $\leq (0.25 \cdot r)\%$

Approx. 0.160 s
 Approx. 0.150 s
 Approx. 0.135 s

Approx. 0.145 s

≤ 0.7 mbar/0.07 kPa/0.010 psi per 10° incline
 (zero offset is possible with position error compensation)

0.005% per 1 V

Rated conditions

Temperature of medium

- Measuring cell with silicone oil filling
 - Measuring cell 30 bar (435 psi)
 - Measuring cell 100 bar (1450 psi)
- Measuring cell with inert oil
- In conjunction with dust explosion protection

-40 ... +100 °C (-40 ... +212 °F)
 -20 ... +100 °C (-4 ... +212 °F)
 -20 ... +100 °C (-4 ... +212 °F)
 -20 ... +100 °C (-4 ... +212 °F)
 -40 ... +85 °C (-4 ... +185 °F)

Ambient conditions

- Ambient temperature/enclosure
 - Measuring cell with silicone oil filling
 - Measuring cell with inert oil
 - Display
- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection
 - According to IEC 60529
 - According to NEMA 250
- Electromagnetic compatibility
 - Emitted interference and interference immunity

Observe the temperature class in areas subject to explosion hazard.
 -40 ... +85 °C (-40 ... +185 °F)
 -40 ... +85 °C (-40 ... +185 °F)
 -20 ... +80 °C (-4 ... +176 °F)
 -50 ... +85 °C (-58 ... +185 °F)
 4K4H

IP66, IP68
 Type 4X

According to IEC 61326 and NAMUR NE 21

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

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 housing	<ul style="list-style-type: none"> • 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	1/4-18 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	<p>Screw terminals</p> <p>Cable entry via the following screwed glands:</p> <ul style="list-style-type: none"> • M20 x 1.5 • 1/2-14 NPT • Device plug Han 7D/Han 8D¹⁾ • Device plug M12

Displays and controls

Keys	4 keys for operation directly on the device
Display	<ul style="list-style-type: none"> • 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	$U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)
Noise	$U_{eff} \leq 1.2 \text{ mV}$ (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: $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$
- Effective internal inductance/capacitance	
• 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: $U_n = 10.5 \text{ to } 45 \text{ V}$, 4 ... 20 mA

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

<ul style="list-style-type: none"> Dust explosion protection for zones 21, 22 <ul style="list-style-type: none"> Marking Permissible ambient temperature Permissible temperature of measuring medium Max. surface temperature Connection Dust explosion protection for zones 20, 21, 22 <ul style="list-style-type: none"> Marking Permissible ambient temperature Permissible temperature of measuring medium Connection Effective internal inductance/capacitance Type of protection for Zone 2 <ul style="list-style-type: none"> Marking Permissible ambient temperature "ec" Permissible ambient temperature "ic" Permissible temperature of measuring medium "ec" connection "ic" connection Explosion protection acc. to FM <ul style="list-style-type: none"> Marking (XP/DIP) or IS; NI; S Explosion protection according to CSA <ul style="list-style-type: none"> Marking (XP/DIP) or (IS) NAMUR recommendations <ul style="list-style-type: none"> NE 06 NE 21 NE 23 NE 43 NE 53 NE 80 NE 105 NE 107 NE 131 	<p>Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc -40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F) 120 °C (248 °F) To a circuit with the operating values: $U_n = 10.5$ to 45 V, 4 ... 20 mA</p> <p>Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db Ex II 3D Ex ic IIIC T120 °C Dc -40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F) 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 $L_i = 0.24$ µH/$C_i = 3.29$ nF</p> <p>Ex II 3G Ex ec IIC T4/T6 Gc Ex II 3G Ex ic IIC T4/T6 Gc -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6 -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +80 °C (-40 ... +176 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To a circuit with the operating values: $U_n = 10.5$ to 30 V, 4 ... 20 mA 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</p> <p>Available soon 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</p> <p>Available soon 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</p> <p>Standardized Electrical Signals and Questions Relating to Engineering Technology Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment Extra Low Voltage Circuits with Safe Separation Standardization of the Signal Level for the Failure Information of Digital Transmitters Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics The Application of the Pressure Equipment Directive to Process Control Devices Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices Self-Monitoring and Diagnosis of Field Devices NAMUR Standard Device - Field Devices for Standard Applications</p>
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¹⁾ Han 8D is identical to Han 8U.

HART communication

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge pressure (differential pressure series)

1

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

Measuring cell filling

Silicone oil

Inert filling liquid

Maximum measuring span

20 mbar (8.037 inH₂O)

60 mbar (24.11 inH₂O)

250 mbar (1005 inH₂O)

600 mbar (241.1 inH₂O)

1 600 mbar (643 inH₂O)

5000 mbar (2009 inH₂O)

30 bar (435 psi)

Process connection

Oval flange, mounting thread: 7/16-20 UNF (IEC 61518)

Oval flange, mounting thread: M10 (PN 160), (DIN 19213)

Oval flange, mounting thread: 7/16-20 UNF (IEC 61518) with lateral ventilation

Oval flange, mounting thread: M10 (PN 160) (DIN 19213) with lateral ventilation

Wetted parts materials: Process connection, seal diaphragm

Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408

Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408

Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408

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))

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))

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))

Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

Enclosure

Dual chamber device

Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

Combination of options B, C and L (zone model)

Combination of options B, C and M (zone model, Class Division)

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 1/2-14 NPT

0

1

3

B

D

G

H

M

P

R

L

M

N

P

0

1

2

4

6

8

1

2

5

A

B

C

D

L







M

S

T

F

M

	Article No.
Pressure transmitters for gauge pressure (differential pressure series)	
SITRANS P320	7MF 0 3 1 -  -  - 
SITRANS P420	7MF 0 4 1 -  -  - 
Local operation/display	
Without display (cover closed)	0
With display (cover closed)	1
With display (cover with glass pane)	2

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge pressure (differential pressure series)

1

Selection and ordering data

Options	Order code	Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.		Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included		Device options	
Plastic	A00	PDF file with device settings	D10
Metal	A01	Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	D20
Stainless steel	A02	FVMQ enclosure sealing	D21
Stainless steel 316L/1.4404	A03	IP66/IP68 degree of protection (not for device plugs M12 and Han)	D30
CMP, for XP devices	A10	TAG label empty	D40
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11	Without labeling of the measuring range on the TAG label	D41
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12	Stainless steel Ex plate 1.4404/316L	D42
Device plug Han mounted left		Overvoltage protection up to 6 kV (external)	D71
Device plug Han 7D (plastic, straight)	A30	Adhesive labels on transport packaging (supplied by customer)	D90
Device plug Han 7D (plastic, angled)	A31		
Device plug Han 7D (metal, straight)	A32	General approval without Ex approval	
Device plug Han 7D (metal, angled)	A33	Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Device plug Han 8D (plastic, straight)	A34	Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
Device plug Han 8D (plastic, angled)	A35	CSA (USA and Canada)	E06
Device plug Han 8D (metal, straight)	A36	EAC	E07
Device plug Han 8D (metal, angled)	A37	FM	E08
Cable socket included		KCC	E09
Plastic, for device plug Han 7D and Han 8D	A40	Export approval CPA (China)	E12
Metal, for device plug Han 7D and Han 8D	A41	Explosion protection approvals	
Device plug M12 mounted left		ATEX (Europe)	E20
Stainless steel, without cable socket	A62	CSA (USA and Canada)	E21
Stainless steel, with cable socket	A63	FM (USA and Canada)	E22
Cable entry/connector mounting		IECEx (Worldwide)	E23
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90	EACEx (GOST-R, -K, -B)	E24
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91	INMETRO (Brazil)	E25
Cable gland/connector mounted left	A97	KCs (Korea)	E26
Cable gland/connector mounted on right	A99	NEPSI (China)	E27
Nameplate labeling (standard labeling: English, unit bar)		PESO (India)	E28
German (bar)	B11	UKR Sepro (Ukraine)	E30
French (bar)	B12	ATEX (Europe) and IECEx (Worldwide)	E47
Spanish (bar)	B13	CSA (Canada) and FM (USA)	E48
Italian (bar)	B14	ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	E49
Chinese (bar)	B15	Marine approvals	
Russian (bar)	B16	DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
English (psi)	B20	LR (Lloyds Register)	E51
English (Pa)	B30	BV (Bureau Veritas)	E52
Chinese (Pa)	B35	ABS (American Bureau of Shipping)	E53
Certificates		RMR (Russian Maritime Register)	E55
Quality test certificate, 5-point factory calibration (IEC 60770-2)	C11	KR (Korean Register of Shipping)	E56
Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12	RINA (Registro Italiano Navale)	E57
Test report - NACE (MR 0103-2012 and MR 0175-2009)	C13	CCS (China Classification Society)	E58
Test report (EN 10204-2.2) - Wetted parts	C14	Country-specific approvals	
Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15	CRN approval Canada (Canadian Registration Number)	E60
Certificates for functional safety			
Functional safety (IEC 61508) - SIL2/3	C20		

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P320/P420

for gauge pressure (differential pressure series)

1

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 test report (EN 10204-2.2)	U01
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (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 test report (EN 10204-2.2)	U03
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)	U04

Pressure Measurement

Pressure transmitters

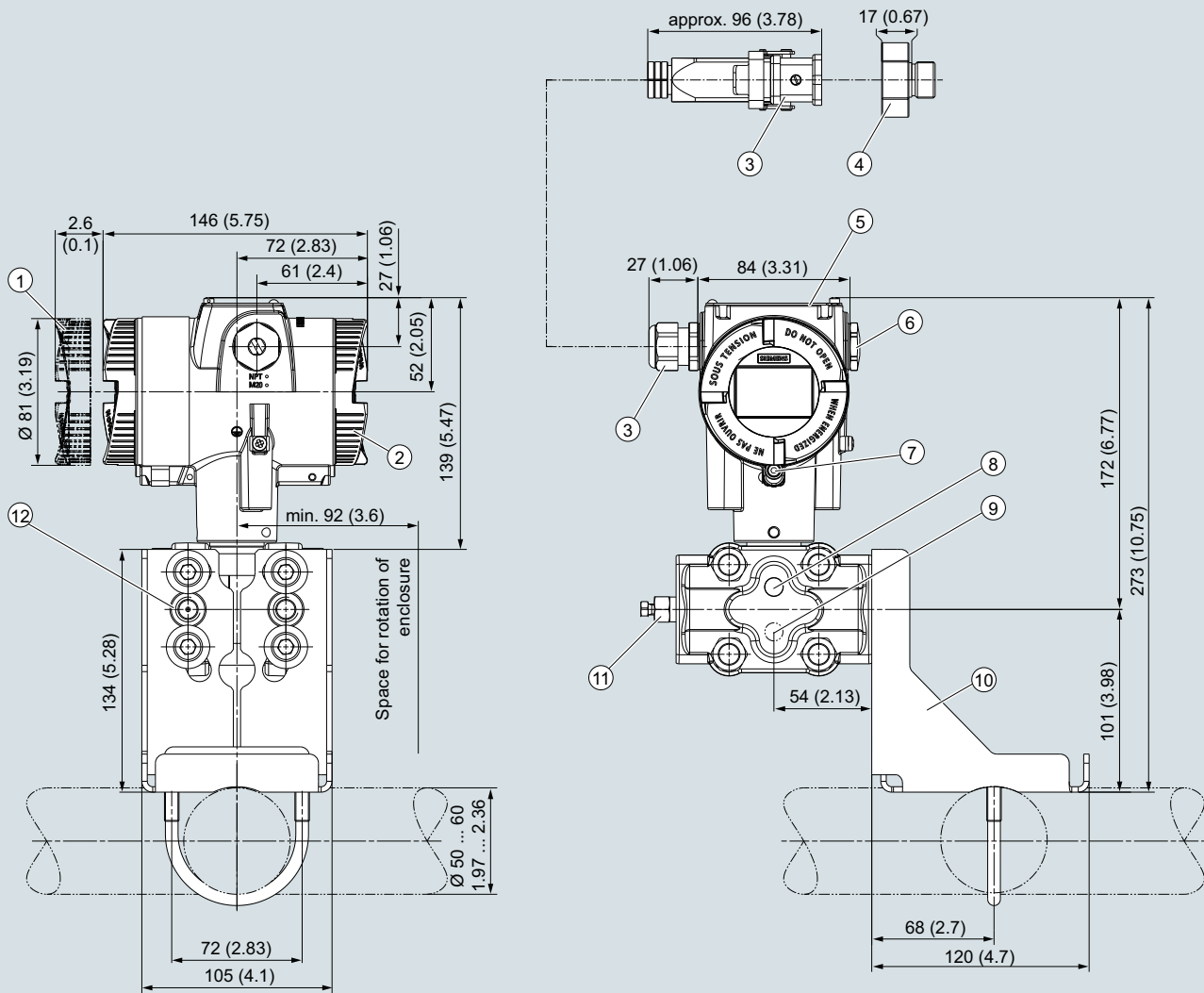
for applications with advanced requirements (Advanced)

SITRANS P320/P420

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.	
Device settings	
Measuring span Start of scale value (max. 5 characters), full scale 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 auto- matically 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, Rela- tive], 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 auto- matically 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 , NI.	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 auto- matically 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; deci- mal 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 1,5³⁾ screw gland
• 1/2-14 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: 1/4-18 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)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

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

Span (infinitely adjustable) or measuring range, max. operating pressure and max. test pressure

Span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange¹⁾

0.01 ... 1 bar
1 ... 100 kPa
0.15 ... 14.5 psi
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
 - Measuring cell with inert oil
 - Measuring cell with FDA-compliant oil
- Upper measuring limit

100 mbar a/10 kPa a/1.45 psi a
100 mbar a/10 kPa a/1.45 psi a
100 mbar a/10 kPa a/1.45 psi a
100% of max. span

Input of absolute pressure, with flush-mounted diaphragm

Measured variable

Absolute pressure

Span (infinitely adjustable) or measuring range, max. operating pressure and max. test pressure

Span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange¹⁾

43 ... 1300 mbar a
4.3 ... 130 kPa a
17 ... 525 inH₂O a
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 span may differ from these values.

Measuring limits

- Low measuring limit
 - Measuring cell with silicone oil filling
- Upper measuring limit

0 bar a/0 kPa a/0 psi a
100% of max. span

Start of scale

Between the measuring limits (infinitely adjustable)

Output

HART

Output signal

4 ... 20 mA
3.55 mA, factory preset to 3.8 mA
22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA
 $I_{pp} \leq 0.5\%$ of max. output current

- Low saturation limit (infinitely adjustable)
- High saturation limit (infinitely adjustable)
- Ripple (without HART communication)

Adjustable damping

0 ... 100 s, continuously adjustable over remote operation
0 ... 100 s, in increments of 0.1 s, adjustable over display
3.55 ... 22.8 mA
3.55 ... 22.8 mA

- Current transmitter
- Failure signal

Load

Resistor R [Ω]
 $R = (U_H - 10.5 \text{ V}) / 22.8 \text{ mA}$,
 U_H : Power supply in V
 $R = 230 \dots 1100 \text{ } \Omega$ (HART communicator (handheld))
 $R = 230 \dots 500 \text{ } \Omega$ (SIMATIC PDM)

- Without HART communication

- With HART communication

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 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
- Start of scale 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

$$r \leq 5: \leq 0.075\%$$

$$5 < r \leq 100: \leq (0.005 \cdot r + 0.05)\%$$

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

$$\leq (0.08 \cdot r + 0.16)\%$$

Influence of the process temperature (in pressure per temperature unit)

- Temperature difference between process temperature 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
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

$$\text{In 5 years} \leq (0.25 \cdot r)\%$$

$$\text{In 5 years} \leq (0.125 \cdot r)\%$$

Step response time T_{63} (without electrical damping)

$$\leq 0.105 \text{ s}$$

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
- Start of scale 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

$$r \leq 10: \leq 0.2\%$$

$$10 < r \leq 30: \leq 0.4\%$$

Influence of ambient temperature in % per 28 °C (50 °F)

- All measuring cells

$$\leq (0.16 \cdot r + 0.24)\%$$

Influence of the process temperature (in pressure per temperature unit)

- Temperature difference between process temperature 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

$$\text{In 5 years} \leq (0.25 \cdot r)\%$$

Step response time T_{63} (without electrical damping)

$$\leq 0.105 \text{ s}$$

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

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

Rated conditions

Temperature of medium²⁾

- Measuring cell with silicone oil filling

-40 ... +150 °C (-40 ... +302 °F)
 -40 ... +200 °C (-40 ... +392 °F) with cooling extension
 -20 ... +100 °C (-4 ... +212 °F)
 -10 ... +150 °C (14 ... +302 °F)

Ambient conditions

- Ambient temperature/enclosure
 - Measuring cell with silicone oil filling
 - Measuring cell with inert oil (different pressure classes)

Observe the temperature class in areas subject to explosion hazard.

-40 ... +85 °C (-40 ... +185 °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 ps

-40 ... +85 °C (-40 ... +185 °F)

- Measuring cell with FDA-compliant oil

- Display

-10 ... +85 °C (14 ... +185 °F)

-20 ... +80 °C (-4 ... +176 °F)

-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))

4K4H

- Storage temperature

- Climatic class in accordance with IEC 60721-3-4

- Degree of protection

- According to IEC 60529

- According to NEMA 250

- Electromagnetic compatibility

- Emitted interference and interference immunity

IP66, IP68

Type 4X

According to IEC 61326 and NAMUR NE 21

Design

Weight (pressure transmitter without mounting flange)

Material

- Wetted parts materials

- Process connection

- Seal diaphragm

- Non-wetted parts materials

- Electronics housing

Stainless steel, mat. no. 1.4404/316L

Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819

- 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)

Steel, electrogalvanized steel, or stainless steel

- Mounting bracket

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 8D³⁾

- 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

$U_{ss} \leq 0.2 \text{ V}$ (47 ... 125 Hz)

Noise

$U_{eff} \leq 1.2 \text{ mV}$ (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)

Drinking water

- WRAS (England)
- ACS (France)
- NSF (USA)

CRN (Canada)

Explosion protection acc. to NEPSI (China)

Explosion protection acc. to INMETRO (Brazil)

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

- Effective internal inductance/capacitance

- Flameproof enclosure "d"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

- Dust explosion protection for zones 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Max. surface temperature
- Connection

- Dust explosion protection for zones 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

- Effective internal inductance/capacitance

- Type of protection for Zone 2

- Marking
- Permissible ambient temperature "ec"
- Permissible ambient temperature "ic"
- Permissible temperature of measuring medium
- "ec" connection
- "ic" connection

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

No.: 1903094 (option E83)

No.: 18 ACC LY 277 (option E85)

No.: 20180920-MH61350 (option E84)

No.: 0F9863.5C (option E60)

No.: GYJ19.1058X (option E27)

No.: BRA-18-GE-0035X (option E25)

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To certified intrinsically safe circuits with peak values:

$U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

Ex II 2D Ex tb IIIC T120 °C Db

Ex II 3D Ex tc IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

120 °C (248 °F)

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

Ex II 1D Ex ia IIIC T120 °C Da

Ex II 2D Ex ib IIIC T120 °C Db

Ex II 3D Ex ic IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 3G Ex ec IIC T4/T6 Gc

Ex II 3G Ex ic IIC T4/T6 Gc

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +40 °C (-40 ... +104 °F) temperature class T6

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +80 °C (-40 ... +176 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 30 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$

Effective internal inductance/capacitance:

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

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

- | | |
|---|---|
| <ul style="list-style-type: none"> • Explosion protection acc. to FM <ul style="list-style-type: none"> - Marking (XP/DIP) or IS; NI; S • Explosion protection according to CSA <ul style="list-style-type: none"> - Marking (XP/DIP) or (IS) | <p>Available soon</p> <p>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</p> <p>Available soon</p> <p>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</p> |
|---|---|

NAMUR recommendations

- | | |
|--|---|
| <ul style="list-style-type: none"> • NE 06 • NE 21 • NE 23 • NE 43 • NE 53 • NE 80 • NE 105 • NE 107 • NE 131 | <p>Standardized Electrical Signals and Questions Relating to Engineering Technology</p> <p>Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment</p> <p>Extra Low Voltage Circuits with Safe Separation</p> <p>Standardization of the Signal Level for the Failure Information of Digital Transmitters</p> <p>Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics</p> <p>The Application of the Pressure Equipment Directive to Process Control Devices</p> <p>Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices</p> <p>Self-Monitoring and Diagnosis of Field Devices</p> <p>NAMUR Standard Device - Field Devices for Standard Applications</p> |
|--|---|

- 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 process temperature 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

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	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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

1

Selection and ordering data

Options	Order code	Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.		Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included		Device options	
Plastic	A00	PDF file with device settings	D10
Metal	A01	Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	D20
Stainless steel	A02	FVMQ enclosure sealing	D21
Stainless steel 316L/1.4404	A03	IP66/IP68 degree of protection (not for device plugs M12 and Han)	D30
CMP, for XP devices	A10	TAG label empty	D40
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11	Without labeling of the measuring range on the TAG label	D41
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12	Stainless steel Ex plate 1.4404/316L	D42
Device plug Han mounted left		Overvoltage protection up to 6 kV (external)	D71
Device plug Han 7D (plastic, straight)	A30	Adhesive labels on transport packaging (supplied by customer)	D90
Device plug Han 7D (plastic, angled)	A31		
Device plug Han 7D (metal, straight)	A32	General approval without Ex approval	
Device plug Han 7D (metal, angled)	A33	Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Device plug Han 8D (plastic, straight)	A34	Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
Device plug Han 8D (plastic, angled)	A35	CSA (USA and Canada)	E06
Device plug Han 8D (metal, straight)	A36	EAC	E07
Device plug Han 8D (metal, angled)	A37	FM	E08
Cable socket included		KCC	E09
Plastic, for device plug Han 7D and Han 8D	A40	Export approval CPA (China)	E12
Metal, for device plug Han 7D and Han 8D	A41	Explosion protection approvals	
Device plug M12 mounted left		ATEX (Europe)	E20
Stainless steel, without cable socket	A62	CSA (USA and Canada)	E21
Stainless steel, with cable socket	A63	FM (USA and Canada)	E22
Cable entry/connector mounting		IECEx (Worldwide)	E23
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90	EACEx (GOST-R, -K, -B)	E24
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91	INMETRO (Brazil)	E25
Cable gland/connector mounted left	A97	KCs (Korea)	E26
Cable gland/connector mounted on right	A99	NEPSI (China)	E27
Nameplate labeling (standard labeling: English, unit bar)		PESO (India)	E28
German (bar)	B11	UKR Sepro (Ukraine)	E30
French (bar)	B12	ATEX (Europe) and IECEx (Worldwide)	E47
Spanish (bar)	B13	CSA (Canada) and FM (USA)	E48
Italian (bar)	B14	ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	E49
Chinese (bar)	B15	Marine approvals	
Russian (bar)	B16	DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
English (psi)	B20	LR (Lloyds Register)	E51
English (Pa)	B30	BV (Bureau Veritas)	E52
Chinese (Pa)	B35	ABS (American Bureau of Shipping)	E53
Certificates		RMR (Russian Maritime Register)	E55
Quality test certificate, 5-point factory calibration (IEC 60770-2)	C11	KR (Korean Register of Shipping)	E56
Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12	RINA (Registro Italiano Navale)	E57
Test report - NACE (MR 0103-2012 and MR 0175-2009)	C13	CCS (China Classification Society)	E58
Test report (EN 10204-2.2) - Wetted parts	C14	Country-specific approvals	
Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15	CRN approval Canada (Canadian Registration Number)	E60
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.	
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" Class 300 RF	M35
• 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

Pressure Measurement

Pressure transmitters

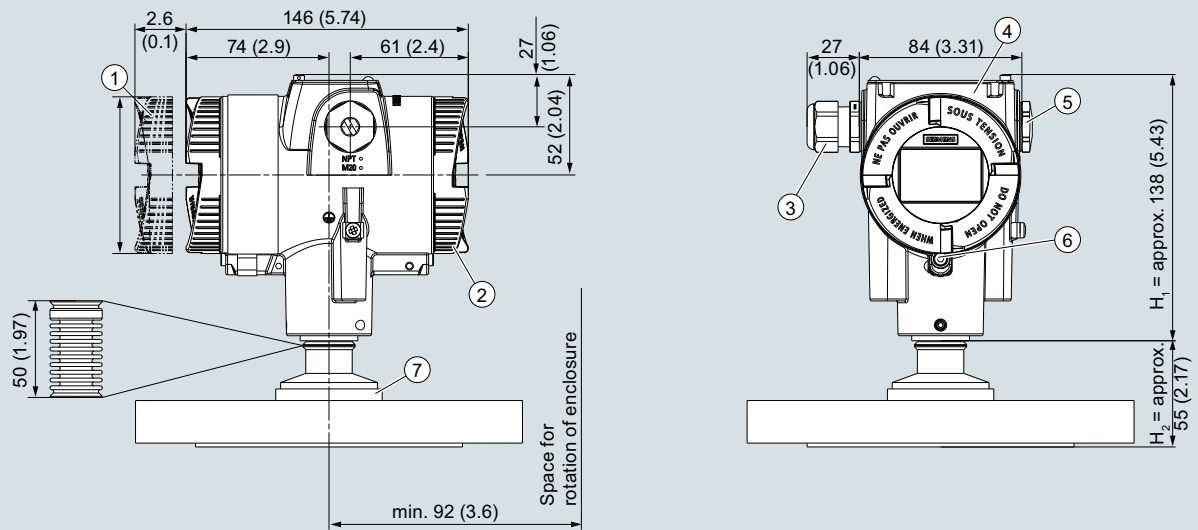
for applications with advanced requirements (Advanced)

SITRANS P320/P420

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.	
Device settings	
<p>Measuring span</p> <p>Start of scale value (max. 5 characters), full scale value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi</p> <p>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).</p> <p>Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm², kg/cm², kgf/cm², inH₂O, inH₂O (4°C), ftH₂O, mmH₂O, mmH₂O (4°C), mH₂O (4°C), mmHg, inHg, atm, torr</p>	Y01
<p>TAG</p> <p>(on stainless steel plate and device parameters, max. 32 characters)</p> <p>Input field: Free text, max. 32 characters</p>	Y15
<p>Measuring point description</p> <p>(on stainless steel plate and device parameters, max. 32 characters)</p> <p>Input field: Free text, max. 32 characters</p>	Y16
<p>TAG short</p> <p>(device parameters, max. 8 characters)</p> <p>Input field: Free text, max. 8 characters</p>	Y17
<p>Local display</p> <p>[Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge</p> <p>Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge</p>	Y21
<p>Local display</p> <p>Scaling with standard units</p> <p>[m³/s, l/s, m, inch, ...], example 1 ... 5 m</p> <p>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).</p> <p>Drop-down list: m, cm, mm, in, ft, m³, l, hl, in³, ft³, yd³, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm³, NI.</p>	Y22
<p>Local display</p> <p>Scaling with user-specific units (max. 12 characters), example 1 ... 5 m</p> <p>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).</p> <p>Input field 3: Free text, max. 8 characters</p>	Y23
<p>Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA</p> <p>Drop-down list 1: 3.9, 4</p> <p>Drop-down list 2: 20.8, 22</p>	Y30
<p>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</p> <p>Drop-down list: 3.75; 21.75; 22.5; 22.6</p>	Y31
<p>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</p> <p>Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.</p>	Y32
<p>ID number of special version</p> <p>Input field: max. 4 characters and only natural numbers from 0 ... 9999</p>	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 1,5³⁾ screw gland
- ½-14 NPT screw gland
- Han 7D/Han 8D^{2) 3)} device plug
- M12 device plug^{2) 3)}

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 Cover over buttons and nameplate
with general information

⑤ Blanking plug

⑥ Safety catch
(only for "flameproof enclosure" type of protection)

⑦ Process connection

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 P320/P420 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.

Pressure Measurement

Pressure transmitters

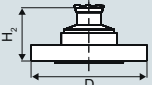
for applications with advanced requirements (Advanced)

SITRANS P320/P420


for gauge and absolute pressure, flush-mounted diaphragm

Flanges according to EN and ASME

Flange according to EN

EN 1092-1					
	Order code	DN	PN	ØD	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")	

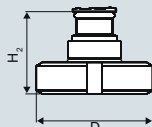
Flanges according to ASME

ASME B16.5					
	Order code	DN	Class	ØD	H ₂
	M30	1"	150	110 mm (4.3")	Approx. 52 mm (2")
	M31	1½"	150	130 mm (5.1")	
	M32	2"	150	150 mm (5.9")	
	M33	3"	150	190 mm (7.5")	
	M34	4"	150	230 mm (9.1")	
	M35	1"	300	125 mm (4.9")	
	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")	

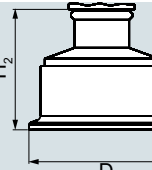
NuG and pharmaceutical connections

Connections to DIN

DIN 11851 (milk pipe union with slotted union nut)

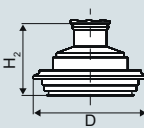
	Order code	DN	PN	ØD	H ₂
	N03	50	25	92 mm (3.6")	Approx. 52 mm (2")
	N05	80	25	127 mm (5.0")	

TriClamp according to DIN 32676

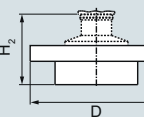
	Order code	DN	PN	ØD	H ₂
	N14	50	16	64 mm (2.5")	Approx. 52 mm (2")
	N15	65	10	91 mm (3.6")	
	N22	2"	16	64 mm (2.5")	Approx. 52 mm (2")
	N23	3"	10	91 mm (3.6")	

Other connections

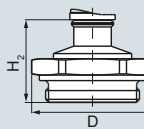
Varivent connection

	Order code	DN	PN	ØD	H ₂
	P06	40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

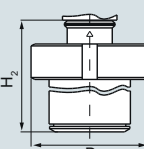
Sanitary process connection according to DRD

	Order code	DN	PN	ØD	H ₂
	Q15	65	40	105 mm (4.1")	Approx. 52 mm (2")

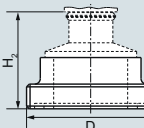
Threaded connection G¾", G1" and G2" acc. to DIN 3852

	Order code	DN	PN	ØD	H ₂
	R11	¾"	63	37 mm (1.5")	Approx. 45 mm (1.8")
	R12	1"	63	48 mm (1.9")	Approx. 47 mm (1.9")
	R14	2"	63	78 mm (3.1")	Approx. 52 mm (2")

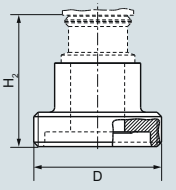
Tank connection TG 52/50 and TG52/150

	Order code	DN	PN	ØD	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")

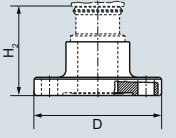
SMS threaded socket

	Order code	DN	PN	ØD	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	

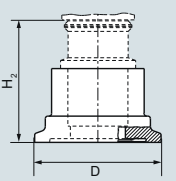
Aseptic threaded socket according to DIN 11864-1 Form A

	Order code	DN	PN	ØD	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 1/4"	
	N36	100	25	130 x 1/4"	

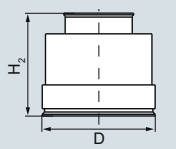
Aseptic flange with notch to DIN 11864-2 Form A

	Order code	DN	PN	ØD	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")	

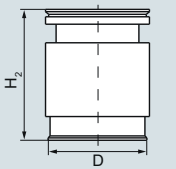
Aseptic clamp with groove according to DIN 11864-3 Form A

	Order code	DN	PN	ØD	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	ØD	H ₂
	R00	-	-	40.9 mm (1.6")	Approx. 36.8 mm (1.4")

Process connection PMC Style Minibolt

	Order code	DN	PN	ØD	H ₂
	R01	-	-	26.3 mm (1.0")	Approx. 33.1 mm (1.3")

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for absolute pressure (pressure series)

1

Technical specifications

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

Input

Measured variable

Absolute pressure

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)

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 inH₂O 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 inH₂O 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
 - Measuring cell with inert oil

0 mbar a/kPa a/psi a

For process temperature $-20^{\circ}\text{C} < \vartheta \leq +60^{\circ}\text{C}$ ($-4^{\circ}\text{F} < \vartheta \leq +140^{\circ}\text{F}$)

30 mbar a/3 kPa a/0.44 psi a

For process temperature $60^{\circ}\text{C} < \vartheta \leq +100^{\circ}\text{C}$ (max. 85°C for measuring cell 30 bar) ($140^{\circ}\text{F} < \vartheta \leq +212^{\circ}\text{F}$ (max. 185°F for measuring cell 435 psi))

$30 \text{ mbar a} + 20 \text{ mbar a} \cdot (\vartheta - 60^{\circ}\text{C})/^{\circ}\text{C}$

$3 \text{ kPa a} + 2 \text{ kPa a} \cdot (\vartheta - 60^{\circ}\text{C})/^{\circ}\text{C}$

$0.44 \text{ psi a} + 0.29 \text{ psi a} \cdot (\vartheta - 140^{\circ}\text{F})/^{\circ}\text{F}$

- 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/process temperature)

- Start of scale

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

$R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$,

U_H : Power supply in V

- With HART communication

$R = 230 \dots 1100 \Omega$ (HART communicator (handheld))

$R = 230 \dots 500 \Omega$ (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 absolute pressure (pressure series)**Measuring accuracy**

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Start of scale 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)

- Linear characteristic (all measuring cells)

- $r \leq 10$ - $10 < r \leq 30$ r = maximum measuring span/set measuring span or nominal measuring range $\leq 0.1\%$ $\leq 0.2\%$

Influence of ambient temperature (in % per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a
- 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

 $\leq (0.15 \cdot r + 0.1)\%$ $\leq (0.08 \cdot r + 0.16)\%$ Long-term stability at ± 30 °C (± 54 °F)In 5 years $\leq (0.25 \cdot r)\%$ 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

Rated conditions

Temperature of medium

- Measuring cell with silicone oil filling
- Measuring cell with inert filling fluid

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F)

Ambient conditions

- Ambient temperature/enclosure
 - Measuring cell with silicone oil filling
 - Measuring cell with inert filling fluid
 - Display
- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection
 - According to IEC 60529
 - According to NEMA 250
- Electromagnetic compatibility
 - Emitted interference and interference immunity

Observe the temperature class in areas subject to explosion hazard.

-40 ... +85 °C (-40 ... +185 °F)

-40 ... +85 °C (-40 ... +185 °F)

-20 ... +80 °C (-4 ... +176 °F)

-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))

4K4H

IP66, IP68

Type 4X

According to IEC 61326 and NAMUR NE 21

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for absolute pressure (pressure series)

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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 housing	<ul style="list-style-type: none"> • Low-copper die-cast aluminum GD-AISI 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	<ul style="list-style-type: none"> • Connection shank G1/2A according to DIN EN 837-1 • Female thread 1/2-14 NPT • Male thread M20 x 1.5 and 1/2-14 NPT • Oval flange (PN 160 (MWP 2320 psi g)) with fastening screw thread: <ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> - 7/16-20 UNF according to EN 61518 - M12 according to DIN 19213 • Male thread M20 x 1.5 and 1/2-14 NPT
Electrical connection	Cable entry via the following screwed glands: <ul style="list-style-type: none"> • M20 x 1.5 • 1/2-14 NPT • Device plug Han 7D/Han 8D¹⁾ • Device plug M12

Displays and controls

Keys	4 keys for operation directly on the device
Display	<ul style="list-style-type: none"> • 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	–

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 L _i = 0.24 μH/C _i = 3.29 nF
- Effective internal inductance/capacitance	
• 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 absolute pressure (pressure series)

<ul style="list-style-type: none"> Dust explosion protection for zones 21, 22 <ul style="list-style-type: none"> Marking Permissible ambient temperature Permissible temperature of measuring medium Max. surface temperature Connection Dust explosion protection for zones 20, 21, 22 <ul style="list-style-type: none"> Marking Permissible ambient temperature Permissible temperature of measuring medium Connection Effective internal inductance/capacitance Type of protection for Zone 2 <ul style="list-style-type: none"> Marking Permissible ambient temperature "ec" Permissible ambient temperature "ic" Permissible temperature of measuring medium "ec" connection "ic" connection Explosion protection acc. to FM <ul style="list-style-type: none"> Marking (XP/DIP) or IS; NI; S Explosion protection according to CSA <ul style="list-style-type: none"> Marking (XP/DIP) or (IS) NAMUR recommendations <ul style="list-style-type: none"> NE 06 NE 21 NE 23 NE 43 NE 53 NE 80 NE 105 NE 107 NE 131 	<p>Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc -40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F) 120 °C (248 °F) To a circuit with the operating values: $U_n = 10.5$ to 45 V, 4 ... 20 mA</p> <p>Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db Ex II 3D Ex ic IIIC T120 °C Dc -40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F) 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 $L_i = 0.24$ µH/$C_i = 3.29$ nF</p> <p>Ex II 3G Ex ec IIC T4/T6 Gc Ex II 3G Ex ic IIC T4/T6 Gc -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6 -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +80 °C (-40 ... +176 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To a circuit with the operating values: $U_n = 10.5$ to 30 V, 4 ... 20 mA 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</p> <p>Available soon 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</p> <p>Available soon 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</p> <p>Standardized Electrical Signals and Questions Relating to Engineering Technology Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment Extra Low Voltage Circuits with Safe Separation Standardization of the Signal Level for the Failure Information of Digital Transmitters Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics The Application of the Pressure Equipment Directive to Process Control Devices Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices Self-Monitoring and Diagnosis of Field Devices NAMUR Standard Device - Field Devices for Standard Applications</p>
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¹⁾ Han 8D is identical to Han 8U.

HART communication

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for absolute pressure (pressure series)

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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

Measuring cell filling

Silicone oil

Inert filling liquid

Maximum measuring span

250 mbar a (100.5 inH₂O a)

1 300 mbar a (522 inH₂O a)

5000 mbar a (72.5 psi a)

30 bar a (435 psi a)

160 bar a (2 321 psi a)

400 bar a (5 802 psi a)

700 bar a (10 153 psi a)

Process connection

Male thread M20 x 1.5

Male thread G $\frac{1}{2}$ (DIN EN 837-1)

Female thread $\frac{1}{2}$ -14 NPT

Male thread $\frac{1}{2}$ -14 NPT

Oval flange, mounting thread: $\frac{7}{16}$ -20 UNF (IEC 61518)

Oval flange, mounting thread: M10 (DIN 19213)

Oval flange, mounting thread: M12 (DIN 19213)

Version for diaphragm seal pressure

Wetted parts materials: Process connection, seal diaphragm

Stainless steel 316L/1.4404, stainless steel 316L/1.4404

Stainless steel 316L/1.4404, alloy C276/2.4819

Alloy C22/2.4602, alloy C276/2.4819

Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

Enclosure

Dual chamber device

Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

Combination of options B, C and L (zone model)

Combination of options B, C and M (zone model, Class Division)

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 $\frac{1}{2}$ -14 NPT

Local operation/display

Without display (cover closed)

With display (cover closed)

With display (cover with glass pane)

0

1

3

F

L

P

R

V

W

X

B

D

E

F

G

H

J

U

0

1

2

1

2

5

A

B

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Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P320/P420

for absolute pressure (pressure series)

1

Selection and ordering data

Options	Order code	Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.		Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included		Device options	
Plastic	A00	PDF file with device settings	D10
Metal	A01	Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	D20
Stainless steel	A02	FVMQ enclosure sealing	D21
Stainless steel 316L/1.4404	A03	IP66/IP68 degree of protection (not for device plugs M12 and Han)	D30
CMP, for XP devices	A10	TAG label empty	D40
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11	Without labeling of the measuring range on the TAG label	D41
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12	Stainless steel Ex plate 1.4404/316L	D42
Device plug Han mounted left		Overvoltage protection up to 6 kV (external)	D71
Device plug Han 7D (plastic, straight)	A30	Adhesive labels on transport packaging (supplied by customer)	D90
Device plug Han 7D (plastic, angled)	A31		
Device plug Han 7D (metal, straight)	A32	General approval without Ex approval	
Device plug Han 7D (metal, angled)	A33	Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Device plug Han 8D (plastic, straight)	A34	Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
Device plug Han 8D (plastic, angled)	A35	CSA (USA and Canada)	E06
Device plug Han 8D (metal, straight)	A36	EAC	E07
Device plug Han 8D (metal, angled)	A37	FM	E08
Cable socket included		KCC	E09
Plastic, for device plug Han 7D and Han 8D	A40	Export approval CPA (China)	E12
Metal, for device plug Han 7D and Han 8D	A41	Explosion protection approvals	
Device plug M12 mounted left		ATEX (Europe)	E20
Stainless steel, without cable socket	A62	CSA (USA and Canada)	E21
Stainless steel, with cable socket	A63	FM (USA and Canada)	E22
Cable entry/connector mounting		IECEx (Worldwide)	E23
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90	EACEx (GOST-R, -K, -B)	E24
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91	INMETRO (Brazil)	E25
Cable gland/connector mounted left	A97	KCs (Korea)	E26
Cable gland/connector mounted on right	A99	NEPSI (China)	E27
Nameplate labeling (standard labeling: English, unit bar)		PESO (India)	E28
German (bar)	B11	UKR Sepro (Ukraine)	E30
French (bar)	B12	ATEX (Europe) and IECEx (Worldwide)	E47
Spanish (bar)	B13	CSA (Canada) and FM (USA)	E48
Italian (bar)	B14	ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	E49
Chinese (bar)	B15	Marine approvals	
Russian (bar)	B16	DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
English (psi)	B20	LR (Lloyds Register)	E51
English (Pa)	B30	BV (Bureau Veritas)	E52
Chinese (Pa)	B35	ABS (American Bureau of Shipping)	E53
Certificates		RMR (Russian Maritime Register)	E55
Quality test certificate, 5-point factory calibration (IEC 60770-2)	C11	KR (Korean Register of Shipping)	E56
Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12	RINA (Registro Italiano Navale)	E57
Test report - NACE (MR 0103-2012 and MR 0175-2009)	C13	CCS (China Classification Society)	E58
Test report (EN 10204-2.2) - Wetted parts	C14	Country-specific approvals	
Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15	CRN approval Canada (Canadian Registration Number)	E60
Certificates for functional safety			
Functional safety (IEC 61508) - SIL2/3	C20		

Pressure Measurement

Pressure transmitters

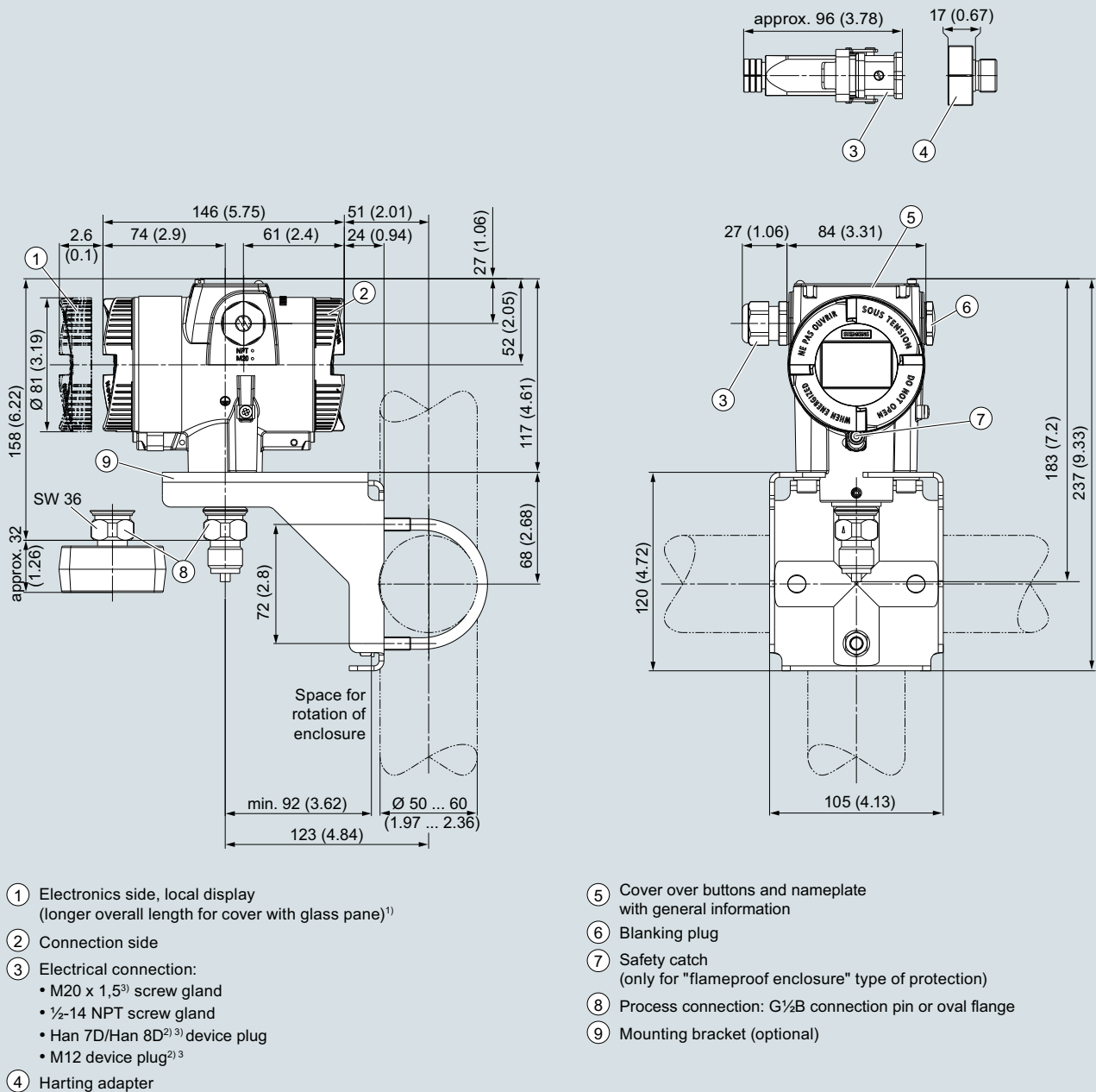
for applications with advanced requirements (Advanced)

SITRANS P320/P420

for absolute pressure (pressure series)

1

Options	Order code	Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.		Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Special approvals		Device settings	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	E80	Measuring span	Y01
Dual seal	E81	Start of scale value (max. 5 characters), full scale value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	E83	Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
NSF61 (drinking water)	E84	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	
ACS (drinking water)	E85		
Mounting bracket		TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Steel, galvanized	H01	Input field: Free text, max. 32 characters	
Stainless steel 1.4301/304	H02	Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
Stainless steel 1.4404/316L	H03	Input field: Free text, max. 32 characters	
Flange connections with flange EN 1092-1		TAG short (device parameters, max. 8 characters)	Y17
With flange adapter G½ Form B1		Input field: Free text, max. 8 characters	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J80	Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge	Y21
• DN 50 PN 40, stainless steel 1.4571/316Ti	J81	Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	
• DN 80 PN 40, stainless steel 1.4571/316Ti	J82	Local display	Y22
With siphon G½ Form B1		Scaling with standard units [m ³ /s, l/s, m, inch, ...], example 1 ... 5 m	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J83	Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
• DN 50 PN 40, stainless steel 1.4571/316Ti	J84	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 , NI.	Y23
• DN 80 PN 40, stainless steel 1.4571/316Ti	J85	Local display	
• DN 25 PN 100, stainless steel 1.4571/316Ti	J86	Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	
Process flanges, gaskets (instead of standard gaskets FKM (FPM))		Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Seal (EN 837-1) material Fe (soft iron)	K60	Input field 3: Free text, max. 8 characters	
Seal (EN 837-1) material 1.4571	K61	Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	Y30
Seal (EN 837-1) material Cu	K62	Drop-down list 1: 3.9, 4	
Process connection		Drop-down list 2: 20.8, 22	
Process connection male thread G½, bore hole 11 mm	K80	Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	Y31
Shut-off valves, valve manifolds		Drop-down list: 3.75; 21.75; 22.5; 22.6	
With mounted valve manifold 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in test report (EN 10204-2.2)	T02	Damping in seconds instead of 2 s (0.0 ... 100.0 s)	Y32
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 test report (EN 10204-2.2)	T03	Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in test report (EN 10204-2.2)	T05	ID number of special version	Y99
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in test report (EN 10204-2.2)	T06	Input field: max. 4 characters and only natural numbers from 0 ... 9999	

Dimensional drawings

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)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for absolute pressure (differential pressure series)

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Technical specifications

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

Input

Measured variable

Absolute pressure

Span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)

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 inH₂O 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 inH₂O 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
 - Measuring cell with inert liquid

0 mbar a/kPa a/psi a

For process temperature $-20^{\circ}\text{C} < \vartheta \leq +60^{\circ}\text{C}$ ($-4^{\circ}\text{F} < \vartheta \leq +140^{\circ}\text{F}$)

30 mbar a/3 kPa a/0.44 psi a

For process temperature $60^{\circ}\text{C} < \vartheta \leq +100^{\circ}\text{C}$ (max. 85°C for measuring cell 30 bar) ($140^{\circ}\text{F} < \vartheta \leq +212^{\circ}\text{F}$ (max. 185°F for measuring cell 435 psi))

30 mbar a + 20 mbar a · ($\vartheta - 60^{\circ}\text{C}$)/ $^{\circ}\text{C}$

3 kPa a + 2 kPa a · ($\vartheta - 60^{\circ}\text{C}$)/ $^{\circ}\text{C}$

0.44 psi a + 0.29 psi a · ($\vartheta - 140^{\circ}\text{F}$)/ $^{\circ}\text{F}$

- 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/process temperature)

- Start of scale

Between the measuring limits (infinitely adjustable)

Output

Output signal

- Low saturation limit (infinitely adjustable)
- High saturation limit (infinitely adjustable)
- Ripple (without HART communication)

4 ... 20 mA

3.55 mA, factory preset to 3.8 mA

22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA

$I_{pp} \leq 0.5\%$ 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

$R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$,

U_H : Power supply in V

- With HART communication

$R = 230 \dots 1100 \Omega$ (HART communicator (handheld))

$R = 230 \dots 500 \Omega$ (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
- Start of scale value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25°C (77°F)

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)

- Linear characteristic (all measuring cells)

- $r \leq 10$
- $10 < r \leq 30$

r = maximum measuring span/set measuring span or nominal measuring range

- $\leq 0.1\%$
- $\leq 0.2\%$

Influence of ambient temperature (in % per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a
- 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

- $\leq (0.15 \cdot r + 0.1)\%$
- $\leq (0.08 \cdot r + 0.16)\%$

Long-term stability at ± 30 °C (± 54 °F)

In 5 years $\leq (0.25 \cdot r)\%$

Step response time T_{63} (without electrical damping)

- 250 mbar a/25 kPa a/3.6 psi a
- 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. 0.195 s

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

Rated conditions

Temperature of medium

- Measuring cell with silicone oil filling
 - Measuring cell 30 bar (435 psi)
 - Measuring cell 100 bar (1450 psi)
- Measuring cell with inert oil
- In conjunction with dust explosion protection

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F)

-40 ... +85 °C (-4 ... +185 °F)

Ambient conditions

- Ambient temperature/enclosure
 - Measuring cell with silicone oil filling
 - Measuring cell with inert oil
 - Display
- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection
 - According to IEC 60529
 - According to NEMA 250
- Electromagnetic compatibility
 - Emitted interference and interference immunity

Observe the temperature class in areas subject to explosion hazard.

-40 ... +85 °C (-40 ... +185 °F)

-40 ... +85 °C (-40 ... +185 °F)

-20 ... +80 °C (-4 ... +176 °F)

-50 ... +85 °C (-58 ... +185 °F); with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))

4K4H

IP66, IP68

Type 4X

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
 - Process flanges and sealing plugs
 - O-ring
- Non-wetted parts materials
 - Electronics housing
 - Pressure flange screws
 - Mounting bracket

Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold

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

FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR

- Low-copper die-cast aluminum GD-AISI 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)

Stainless steel ISO 3506-1 A4-70

Steel, electrogalvanized steel, or stainless steel

Process connection

1/4-18 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
- 1/2-14 NPT
- Device plug Han 7D/Han 8D¹⁾
- Device plug M12

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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

$U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)

Noise

$U_{eff} \leq 1.2 \text{ mV}$ (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)
- ACS (France)
- NSF (USA)

No.: 1903094 (option E83)

No.: 18 ACC LY 277 (option E85)

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:

$U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$

- Effective internal inductance/capacitance

- 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:

$U_n = 10.5 \text{ to } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

- 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:

$U_n = 10.5 \text{ to } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

- 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

Ex II 3D Ex ic IIIC T120 °C Dc

- 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:

$U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$

- Effective internal inductance/capacitance

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

<ul style="list-style-type: none"> Type of protection for Zone 2 <ul style="list-style-type: none"> - Marking - Permissible ambient temperature "ec" - Permissible ambient temperature "ic" - Permissible temperature of measuring medium - "ec" connection - "ic" connection 	<p>Ex II 3G Ex ec IIC T4/T6 Gc Ex II 3G Ex ic IIC T4/T6 Gc</p> <p>-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6 -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +80 °C (-40 ... +176 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>To a circuit with the operating values: $U_n = 10.5$ to 30 V, 4 ... 20 mA 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</p> <p>Effective internal inductance/capacitance: $L_i = 0.24$ μH/$C_i = 3.29$ nF Available soon</p> <p>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 Available soon</p> <p>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</p>
<ul style="list-style-type: none"> Explosion protection acc. to FM <ul style="list-style-type: none"> - Marking (XP/DIP) or IS; NI; S Explosion protection according to CSA <ul style="list-style-type: none"> - Marking (XP/DIP) or (IS) 	<p>Standardized Electrical Signals and Questions Relating to Engineering Technology Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment Extra Low Voltage Circuits with Safe Separation Standardization of the Signal Level for the Failure Information of Digital Transmitters Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics The Application of the Pressure Equipment Directive to Process Control Devices Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices Self-Monitoring and Diagnosis of Field Devices NAMUR Standard Device - Field Devices for Standard Applications</p>
NAMUR recommendations	
<ul style="list-style-type: none"> NE 06 NE 21 NE 23 NE 43 NE 53 NE 80 NE 105 NE 107 NE 131 	

¹⁾ Han 8D is identical to Han 8U.

HART communication

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

Pressure Measurement

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SITRANS P320/P420

for absolute pressure (differential pressure series)

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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

Measuring cell filling

Silicone oil

Inert filling liquid

Maximum measuring span

250 mbar a (100.5 inH₂O a)

1 300 mbar a (522 inH₂O a)

5000 mbar a (72.5 psi a)

30 bar a (435 psi a)

100 bar a (1450 psi a)

Process connection

Oval flange, mounting thread: 7/16-20 UNF (IEC 61518)

Oval flange, mounting thread: M10 (DIN 19213)

Oval flange, mounting thread: 7/16-20 UNF (IEC 61518) with lateral ventilation

Oval flange, mounting thread: M10 (DIN 19213) with lateral ventilation

Version for diaphragm seal with mounting thread 7/16-20 UNF (IEC 61518)

Version for diaphragm seal with mounting thread M10 (DIN 19213)

Wetted parts materials: Process connection, seal diaphragm

Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408

Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408

Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408

Tantalum/tantalum, process flange stainless steel 316/1.4408

Monel 00/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408

Stainless steel 316L/1.4404, gold-plated, process flange stainless steel 316/1.4408

Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

Enclosure

Dual chamber device

Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

Combination of options B, C and L (zone model)

Combination of options B, C and M (zone model, Class Division)

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 1/2-14 NPT

Local operation/display

Without display (cover closed)

With display (cover closed)

With display (cover with glass pane)

0

1

3

G

L

P

R

U

Q

R

S

T

V

W

0

1

2

4

6

8

1

2

5

A

B

C

D

L

M

S

T

F

M

0

1

2

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P320/P420

for absolute pressure (differential pressure series)

1

Selection and ordering data

Options	Order code	Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.		Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included		Device options	
Plastic	A00	PDF file with device settings	D10
Metal	A01	Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	D20
Stainless steel	A02	FVMQ enclosure sealing	D21
Stainless steel 316L/1.4404	A03	IP66/IP68 degree of protection (not for device plugs M12 and Han)	D30
CMP, for XP devices	A10	TAG label empty	D40
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11	Without labeling of the measuring range on the TAG label	D41
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12	Stainless steel Ex plate 1.4404/316L	D42
Device plug Han mounted left		Overvoltage protection up to 6 kV (external)	D71
Device plug Han 7D (plastic, straight)	A30	Adhesive labels on transport packaging (supplied by customer)	D90
Device plug Han 7D (plastic, angled)	A31		
Device plug Han 7D (metal, straight)	A32	General approval without Ex approval	
Device plug Han 7D (metal, angled)	A33	Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Device plug Han 8D (plastic, straight)	A34	Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
Device plug Han 8D (plastic, angled)	A35	CSA (USA and Canada)	E06
Device plug Han 8D (metal, straight)	A36	EAC	E07
Device plug Han 8D (metal, angled)	A37	FM	E08
Cable socket included		KCC	E09
Plastic, for device plug Han 7D and Han 8D	A40	Export approval CPA (China)	E12
Metal, for device plug Han 7D and Han 8D	A41	Explosion protection approvals	
Device plug M12 mounted left		ATEX (Europe)	E20
Stainless steel, without cable socket	A62	CSA (USA and Canada)	E21
Stainless steel, with cable socket	A63	FM (USA and Canada)	E22
Cable entry/connector mounting		IECEx (Worldwide)	E23
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90	EACEx (GOST-R, -K, -B)	E24
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91	INMETRO (Brazil)	E25
Cable gland/connector mounted left	A97	KCs (Korea)	E26
Cable gland/connector mounted on right	A99	NEPSI (China)	E27
Nameplate labeling (standard labeling: English, unit bar)		PESO (India)	E28
German (bar)	B11	UKR Sepro (Ukraine)	E30
French (bar)	B12	ATEX (Europe) and IECEx (Worldwide)	E47
Spanish (bar)	B13	CSA (Canada) and FM (USA)	E48
Italian (bar)	B14	ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	E49
Chinese (bar)	B15	Marine approvals	
Russian (bar)	B16	DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
English (psi)	B20	LR (Lloyds Register)	E51
English (Pa)	B30	BV (Bureau Veritas)	E52
Chinese (Pa)	B35	ABS (American Bureau of Shipping)	E53
Certificates		RMR (Russian Maritime Register)	E55
Quality test certificate, 5-point factory calibration (IEC 60770-2)	C11	KR (Korean Register of Shipping)	E56
Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12	RINA (Registro Italiano Navale)	E57
Test report - NACE (MR 0103-2012 and MR 0175-2009)	C13	CCS (China Classification Society)	E58
Test report (EN 10204-2.2) - Wetted parts	C14	Country-specific approvals	
Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15	CRN approval Canada (Canadian Registration Number)	E60
Certificates for functional safety			
Functional safety (IEC 61508) - SIL2/3	C20		

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for absolute pressure (differential pressure series)

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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 test report (EN 10204-2.2)	U01
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (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 test report (EN 10204-2.2)	U03
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (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	
<p>Measuring span Start of scale value (max. 5 characters), full scale value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi</p> <p>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).</p> <p>Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm², kg/cm², kgf/cm², inH₂O, inH₂O (4°C), ftH₂O, mmH₂O, mmH₂O (4°C), mH₂O (4°C), mmHg, inHg, atm, torr</p>	Y01
<p>TAG (on stainless steel plate and device parameters, max. 32 characters)</p> <p>Input field: Free text, max. 32 characters</p>	Y15
<p>Measuring point description (on stainless steel plate and device parameters, max. 32 characters)</p> <p>Input field: Free text, max. 32 characters</p>	Y16
<p>TAG short (device parameters, max. 8 characters)</p> <p>Input field: Free text, max. 8 characters</p>	Y17
<p>Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge</p> <p>Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge</p>	Y21
<p>Local display Scaling with standard units [m³/s, l/s, m, inch, ...], example 1 ... 5 m</p> <p>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).</p> <p>Drop-down list: m, cm, mm, in, ft, m³, l, hl, in³, ft³, yd³, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm³, NI.</p>	Y22
<p>Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m</p> <p>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).</p> <p>Input field 3: Free text, max. 8 characters</p>	Y23
<p>Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA</p> <p>Drop-down list 1: 3.9, 4</p> <p>Drop-down list 2: 20.8, 22</p>	Y30
<p>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</p> <p>Drop-down list: 3.75; 21.75; 22.5; 22.6</p>	Y31
<p>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</p> <p>Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.</p>	Y32
<p>ID number of special version</p> <p>Input field: max. 4 characters and only natural numbers from 0 ... 9999</p>	Y99

Pressure Measurement

Pressure transmitters

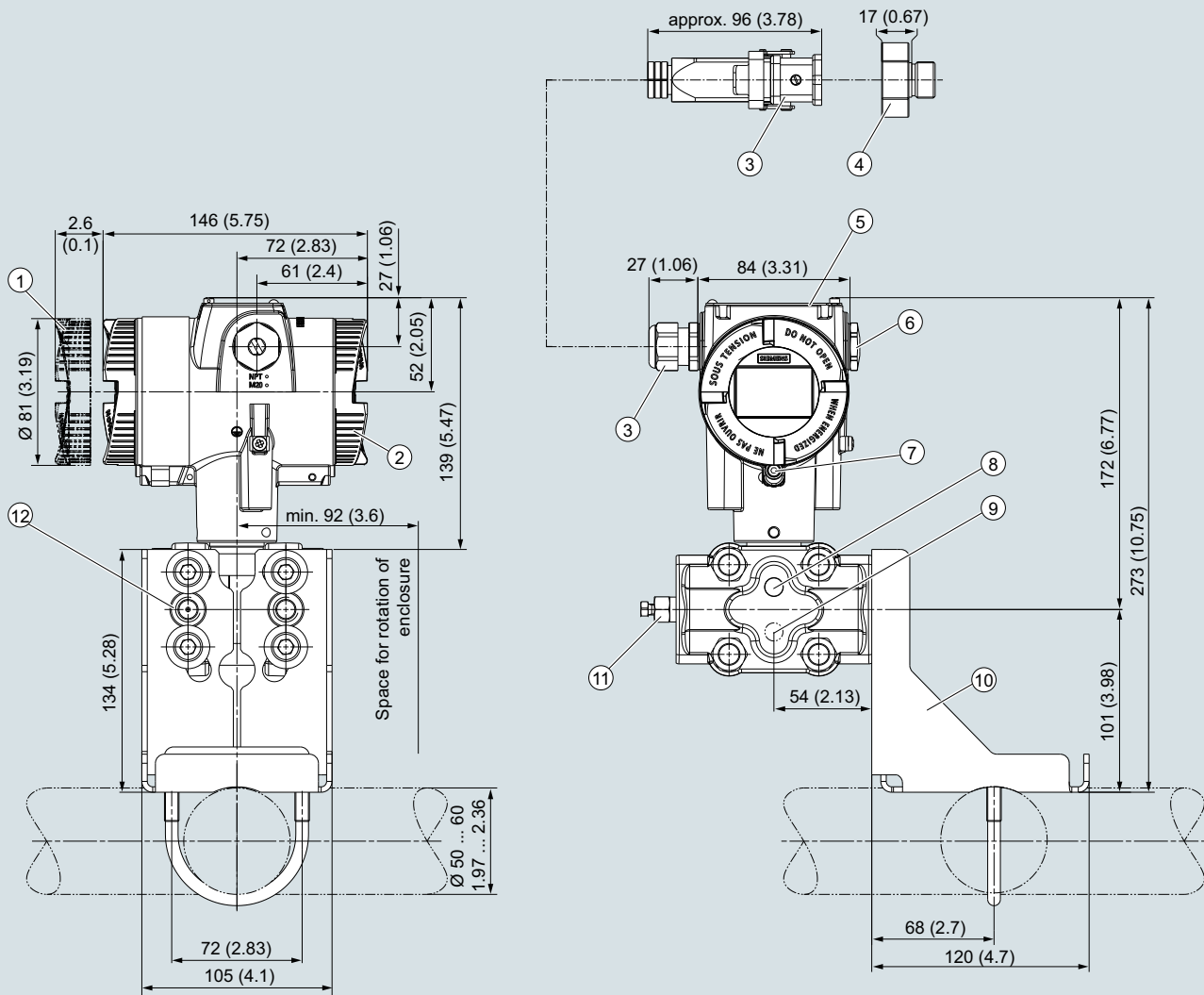
for applications with advanced requirements (Advanced)

SITRANS P320/P420

for absolute pressure (differential pressure series)

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Dimensional drawings



- | | |
|---|---|
| <p>① Electronics side, local display (longer overall length for cover with glass pane)¹⁾</p> <p>② Connection side</p> <p>③ Electrical connection:</p> <ul style="list-style-type: none"> • M20 x 1,5³⁾ screw gland • ½-14 NPT screw gland • Han 7D/Han 8D^{2) 3)} device plug • M12 device plug^{2) 3)} <p>④ Harting adapter</p> <p>⑤ Cover over buttons and nameplate with general information</p> | <p>⑥ Blanking plug</p> <p>⑦ Safety catch (only for "flameproof enclosure" type of protection)</p> <p>⑧ Lateral ventilation for liquid measurement (Standard)</p> <p>⑨ Lateral ventilation for gas measurement (order option K85)</p> <p>⑩ Mounting bracket (optional)</p> <p>⑪ Sealing plug with valve (optional)</p> <p>⑫ Process connection: ¼-18 NPT (IEC 61518)</p> |
|---|---|

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			
Span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	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 ₂ O	2320 psi	3481 psi	
	1 ... 60 mbar	160 bar	240 bar	
	0.1 ... 6 kPa	16 MPa	24 MPa	
	0.4019 ... 24.11 inH ₂ O	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 ₂ O	2320 psi	3481 psi	
	6 ... 600 mbar	160 bar	240 bar	
	0.6 ... 60 kPa	16 MPa	24 MPa	
	2.41 ... 241.1 inH ₂ O	2320 psi	3481 psi	
	16 ... 1600 mbar	160 bar	240 bar	
	1.6 ... 160 kPa	16 MPa	24 MPa	
	6.43 ... 643 inH ₂ O	2320 psi	3481 psi	
	50 ... 5000 mbar	160 bar	240 bar	
	5 ... 500 kPa	16 MPa	24 MPa	
	20.09 ... 2009 inH ₂ O	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 ₂ O	6092 psi	9137 psi	
	6 ... 600 mbar	420 bar	630 bar	
	0.6 ... 60 kPa	42 MPa	63 MPa	
	2.41 ... 241.1 inH ₂ O	6092 psi	9137 psi	
	16 ... 1600 mbar	420 bar	630 bar	
	1.6 ... 160 kPa	42 MPa	63 MPa	
	6.43 ... 643 inH ₂ O	6092 psi	9137 psi	
	50 ... 5000 mbar	420 bar	630 bar	
	5 ... 500 kPa	42 MPa	63 MPa	
	20.09 ... 2009 inH ₂ O	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 process temperature -20 °C < $\vartheta \leq +60$ °C (-4 °F < $\vartheta \leq +140$ °F)	-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a	
		For process temperature 60 °C < $\vartheta \leq +100$ °C (max. 85 °C for measuring cell 30 bar with PN 420) (140 °F < $\vartheta \leq +212$ °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)/°C 0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F	
	- Measuring cell with FDA-compliant oil	For process temperature -10 °C < $\vartheta \leq +100$ °C (-14 °F < $\vartheta \leq +212$ °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/process temperature)		
	• Start of scale	Between the measuring limits (infinitely adjustable)		

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for differential pressure and flow

SITRANS P320 / SITRANS P420 for differential pressure and flow

Output	HART
Output signal	4 ... 20 mA
<ul style="list-style-type: none"> Low saturation limit (infinitely adjustable) High saturation limit (infinitely adjustable) Ripple (without HART communication) 	3.55 mA, factory preset to 3.8 mA 22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA $I_{pp} \leq 0.5\%$ of max. output current
Adjustable damping	0 ... 100 s, continuously adjustable over remote operation
<ul style="list-style-type: none"> Current transmitter Failure signal 	0 ... 100 s, in increments of 0.1 s, adjustable over display
Load	3.55 ... 22.8 mA
<ul style="list-style-type: none"> Without HART communication 	3.55 ... 22.8 mA
<ul style="list-style-type: none"> With HART communication 	Resistor R [Ω] $R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$, U_H : Power supply in V $R = 230 \dots 1100 \Omega$ (HART communicator (handheld)) $R = 230 \dots 500 \Omega$ (SIMATIC PDM)
Characteristic curve	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> According to EN 60770-1 Rising characteristic curve Start of scale 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
<ul style="list-style-type: none"> Linear characteristic 	
- 20 mbar/2 kPa/0.29 psi	$r \leq 5$: $\leq 0.075\%$ $5 < r \leq 20$: $\leq (0.005 \cdot r + 0.05)\%$
- 60 mbar/6 kPa/0.87 psi	$r \leq 5$: $\leq 0.075\%$ $5 < r \leq 60$: $\leq (0.005 \cdot r + 0.05)\%$
- 250 mbar/25 kPa/3.63 psi	$r \leq 5$: $\leq 0.065\%$ (SITRANS P320)
- 600 mbar/60 kPa/8.7 psi	$5 < r \leq 100$: $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P320)
- 1600 mbar/160 kPa/23.21 psi	
- 5 bar/500 kPa/72.5 psi	
- 30 bar/3 MPa/435 psi	
- 250 mbar/25 kPa/3.63 psi (PN 160)	$r \leq 5$: $\leq 0.04\%$ (SITRANS P420)
- 600 mbar/60 kPa/8.7 psi	$5 < r \leq 100$: $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P420)
- 1600 mbar/160 kPa/23.21 psi	
- 5 bar/500 kPa/72.5 psi	
- 30 bar/3 MPa/435 psi	
- 250 mbar/25 kPa/3.63 psi (PN 420)	$r \leq 5$: $\leq 0.065\%$ (SITRANS P420)
<ul style="list-style-type: none"> Square-rooted characteristic (flow > 50%) 	
- 20 mbar/2 kPa/0.29 psi	$r \leq 5$: $\leq 0.075\%$ $5 < r \leq 20$: $\leq (0.005 \cdot r + 0.05)\%$
- 60 mbar/6 kPa/0.87 psi	$r \leq 5$: $\leq 0.075\%$ $5 < r \leq 60$: $\leq (0.005 \cdot r + 0.05)\%$
- 250 mbar/25 kPa/3.63 psi	$r \leq 5$: $\leq 0.065\%$ (SITRANS P320)
- 600 mbar/60 kPa/8.7 psi	$5 < r \leq 100$: $\leq 0.04\%$ (SITRANS P420)
- 1600 mbar/160 kPa/23.21 psi	$\leq (0.004 \cdot r + 0.045)\%$
- 5 bar/500 kPa/72.5 psi	
- 30 bar/3 MPa/435 psi	
<ul style="list-style-type: none"> Square-rooted characteristic (flow 25 ... 50%) 	
- 20 mbar/2 kPa/0.29 psi	$r \leq 5$: $\leq 0.15\%$ $5 < r \leq 20$: $\leq (0.01 \cdot r + 0.1)\%$
- 60 mbar/6 kPa/0.87 psi	$r \leq 5$: $\leq 0.15\%$ $5 < r \leq 60$: $\leq (0.01 \cdot r + 0.1)\%$
- 250 mbar/25 kPa/3.63 psi	$r \leq 5$: $\leq 0.13\%$ (SITRANS P320)
- 600 mbar/60 kPa/8.7 psi	$\leq 0.08\%$ (SITRANS P420)
- 1600 mbar/160 kPa/23.21 psi	$\leq (0.008 \cdot r + 0.09)\%$
- 5 bar/500 kPa/72.5 psi	
- 30 bar/3 MPa/435 psi	

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 $\leq (0.15 \cdot r + 0.1)\%$
- 60 mbar/6 kPa/0.87 psi $\leq (0.075 \cdot r + 0.1)\%$
- 250 mbar/25 kPa/3.63 psi $\leq (0.025 \cdot r + 0.125)\%$ (SITRANS P320)
- 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
- 250 mbar/25 kPa/3.63 psi $\leq (0.025 \cdot r + 0.0625)\%$ (SITRANS P420)
- 5 bar/500 kPa/72.5 psi
- 600 mbar/60 kPa/8.7 psi $\leq (0.0125 \cdot r + 0.0625)\%$ (SITRANS P420)
- 1600 mbar/160 kPa/23.21 psi
- 30 bar/3 MPa/435 psi

Effect of static pressure

- on the start of scale Zero-point correction is possible with position error compensation
 - 20 mbar/2 kPa/0.29 psi $\leq (0.3 \cdot r)\%$ per 70 bar (SITRANS P320)
 - 60 mbar/6 kPa/0.87 psi $\leq (0.2 \cdot r)\%$ per 70 bar (SITRANS P420)
 - 250 mbar/25 kPa/3.63 psi $\leq (0.1 \cdot r)\%$ per 70 bar
 - 600 mbar/60 kPa/8.7 psi
 - 1600 mbar/160 kPa/23.21 psi
 - 30 bar/3 MPa/435 psi
 - 5 bar/500 kPa/72.5 psi $\leq (0.15 \cdot r)\%$ per 70 bar
- on the span
 - 20 mbar/2 kPa/0.29 psi $\leq 0.2\%$ per 70 bar
 - 60 mbar/6 kPa/0.87 psi $\leq 0.1\%$ per 70 bar
 - 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

Long-term stability at ± 30 °C (± 54 °F)

- 20 mbar/2 kPa/0.29 psi Static pressure max. 70 bar/7 MPa/1015 psi
- 60 mbar/6 kPa/0.87 psi $\leq (0.2 \cdot r)\%$ per year
- 250 mbar/25 kPa/3.63 psi In 5 years $\leq (0.25 \cdot r)\%$
- 600 mbar/60 kPa/8.7 psi In 5 years $\leq (0.125 \cdot r)\%$
- 1600 mbar/160 kPa/23.21 psi In 10 years $\leq (0.15 \cdot r)\%$
- 5 bar/500 kPa/72.5 psi
- 30 bar/3 MPa/435 psi In 5 years $\leq (0.25 \cdot r)\%$
- In 10 years $\leq (0.35 \cdot r)\%$

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 Approx. 0.135 s
- 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

Effect of mounting position (in pressure per change of angle)

 ≤ 0.7 mbar/0.07 kPa/0.028 inH₂O 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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for differential pressure and flow

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SITRANS P320 / SITRANS P420 for differential pressure and flow

Rated conditions

Temperature of medium

- Measuring cell with silicone oil filling
 - Measuring cell 30 bar (435 psi)
- Measuring cell with inert oil
- Measuring cell with FDA-compliant oil
- In conjunction with dust explosion protection

-40 ... +100 °C (-40 ... +212 °F)
 -20 ... +100 °C (-4 ... +212 °F)
 -20 ... +100 °C (-4 ... +212 °F)
 -10 ... +100 °C (14 ... +212 °F)
 -40 ... +85 °C (-4 ... +185 °F)

Ambient conditions

- Ambient temperature/enclosure
 - Measuring cell with silicone oil filling
 - Measuring cell with inert oil
 - Measuring cell with FDA-compliant oil
 - Display
- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection
 - According to IEC 60529
 - According to NEMA 250
- Electromagnetic compatibility
 - Emitted interference and interference immunity

Observe the temperature class in areas subject to explosion hazard.
 -40 ... +85 °C (-40 ... +185 °F)
 -40 ... +85 °C (-40 ... +185 °F)
 -10 ... +85 °C (14 ... +185 °F)
 -20 ... +80 °C (-4 ... +176 °F)
 -50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))
 4K4H
 IP66, IP68
 Type 4X
 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
 - Process flanges and sealing plugs
 - O-ring
- Non-wetted parts materials
 - Electronics housing
 - Pressure flange screws
 - Mounting bracket

Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
 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
 FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
 • 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)
 Stainless steel ISO 3506-1 A4-70
 Steel, electrogalvanized steel, or stainless steel

Process connection

1/4-18 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
 • 1/2-14 NPT
 • Device plug Han 7D/Han 8D¹⁾
 • 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

$U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)

Noise

$U_{eff} \leq 1.2 \text{ mV}$ (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)

Drinking water

- WRAS (England)
- ACS (France)
- NSF (USA)

CRN (Canada)

Explosion protection acc. to NEPSI (China)

Explosion protection acc. to INMETRO (Brazil)

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

- Effective internal inductance/capacitance

- Flameproof enclosure "d"

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

- Dust explosion protection for zones 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Max. surface temperature
- Connection

- Dust explosion protection for zones 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible temperature of measuring medium
- Connection

- Effective internal inductance/capacitance

- Type of protection for Zone 2

- Marking
- Permissible ambient temperature "ec"
- Permissible ambient temperature "ic"
- Permissible temperature of measuring medium
- "ec" connection
- "ic" connection

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

No.: 1903094 (option E83)

No.: 18 ACC LY 277 (option E85)

No.: 20180920-MH61350 (option E84)

No.: 0F9863.5C (option E60)

No.: GYJ19.1058X (option E27)

No.: BRA-18-GE-0035X (option E25)

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
 -40 ... +100 °C (-40 ... +212 °F) temperature class T4
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6

To certified intrinsically safe circuits with peak values:

$U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
 -40 ... +100 °C (-40 ... +212 °F) temperature class T4
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

Ex II 2D Ex tb IIIC T120 °C Db

Ex II 3D Ex tc IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

120 °C (248 °F)

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

Ex II 1D Ex ia IIIC T120 °C Da

Ex II 2D Ex ib IIIC T120 °C Db

Ex II 3D Ex ic IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 3G Ex ec IIC T4/T6 Gc

Ex II 3G Ex ic IIC T4/T6 Gc

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +40 °C (-40 ... +104 °F) temperature class T6

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +80 °C (-40 ... +176 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 30 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$

Effective internal inductance/capacitance:

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

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<ul style="list-style-type: none"> Explosion protection acc. to FM <ul style="list-style-type: none"> - Marking (XP/DIP) or IS; NI; S Explosion protection according to CSA <ul style="list-style-type: none"> - Marking (XP/DIP) or (IS) 	<p>Available soon</p> <p>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</p> <p>Available soon</p> <p>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</p>
NAMUR recommendations	
<ul style="list-style-type: none"> NE 06 NE 21 NE 23 NE 43 NE 53 NE 80 NE 105 NE 107 NE 131 	<p>Standardized Electrical Signals and Questions Relating to Engineering Technology</p> <p>Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment</p> <p>Extra Low Voltage Circuits with Safe Separation</p> <p>Standardization of the Signal Level for the Failure Information of Digital Transmitters</p> <p>Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics</p> <p>The Application of the Pressure Equipment Directive to Process Control Devices</p> <p>Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices</p> <p>Self-Monitoring and Diagnosis of Field Devices</p> <p>NAMUR Standard Device - Field Devices for Standard Applications</p>

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 ₂ O)	B
60 mbar (24.11 inH ₂ O)	D
250 mbar (100.5 inH ₂ O)	G
600 mbar (241.1 inH ₂ O)	H
1 600 mbar (643 inH ₂ O)	M
5000 mbar (2009 inH ₂ O)	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	
• 2 x 1/2-14 NPT	F M

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		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

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 ₂ O)	G
600 mbar (241.1 inH ₂ O)	H
1 600 mbar (643 inH ₂ O)	M
5000 mbar (2009 inH ₂ O)	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

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Selection and ordering data

Options	Order code	Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.		Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included		Device options	
Plastic	A00	PDF file with device settings	D10
Metal	A01	Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	D20
Stainless steel	A02	FVMQ enclosure sealing	D21
Stainless steel 316L/1.4404	A03	IP66/IP68 degree of protection (not for device plugs M12 and Han)	D30
CMP, for XP devices	A10	TAG label empty	D40
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11	Without labeling of the measuring range on the TAG label	D41
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12	Stainless steel Ex plate 1.4404/316L	D42
Device plug Han mounted left		Increase of pressure stage from PN 420 to PN 500 (tested according to IEC 61010. Only permissible for process media of fluid group 2 acc. to DGRL. Not suitable for use with hazardous process media.))	D50
Device plug Han 7D (plastic, straight)	A30	Overvoltage protection up to 6 kV (external)	D71
Device plug Han 7D (plastic, angled)	A31	Adhesive labels on transport packaging (supplied by customer)	D90
Device plug Han 7D (metal, straight)	A32		
Device plug Han 7D (metal, angled)	A33	General approval without Ex approval	
Device plug Han 8D (plastic, straight)	A34	Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Device plug Han 8D (plastic, angled)	A35	Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
Device plug Han 8D (metal, straight)	A36	CSA (USA and Canada)	E06
Device plug Han 8D (metal, angled)	A37	EAC	E07
Cable socket included		FM	E08
Plastic, for device plug Han 7D and Han 8D	A40	KCC	E09
Metal, for device plug Han 7D and Han 8D	A41	Export approval CPA (China)	E12
Device plug M12 mounted left		Explosion protection approvals	
Stainless steel, without cable socket	A62	ATEX (Europe)	E20
Stainless steel, with cable socket	A63	CSA (USA and Canada)	E21
Cable entry/connector mounting		FM (USA and Canada)	E22
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90	IECEX (Worldwide)	E23
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91	EACEX (GOST-R, -K, -B)	E24
Cable gland/connector mounted left	A97	INMETRO (Brazil)	E25
Cable gland/connector mounted on right	A99	KCs (Korea)	E26
Nameplate labeling (standard labeling: English, unit bar)		NEPSI (China)	E27
German (bar)	B11	PESO (India)	E28
French (bar)	B12	UKR Sepro (Ukraine)	E30
Spanish (bar)	B13	ATEX (Europe) and IECEX (Worldwide)	E47
Italian (bar)	B14	CSA (Canada) and FM (USA)	E48
Chinese (bar)	B15	ATEX (Europe) and IECEX (Worldwide) + CSA (Canada) and FM (USA)	E49
Russian (bar)	B16		
English (psi)	B20	Marine approvals	
English (Pa)	B30	DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
Chinese (Pa)	B35	LR (Lloyds Register)	E51
Certificates		BV (Bureau Veritas)	E52
Quality test certificate, 5-point factory calibration (IEC 60770-2)	C11	ABS (American Bureau of Shipping)	E53
Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12	RMR (Russian Maritime Register)	E55
Test report - NACE (MR 0103-2012 and MR 0175-2009)	C13	KR (Korean Register of Shipping)	E56
Test report (EN 10204-2.2) - Wetted parts	C14	RINA (Registro Italiano Navale)	E57
Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15	CCS (China Classification Society)	E58
Certificates for functional safety		Country-specific approvals	
Functional safety (IEC 61508) - SIL2/3	C20	CRN approval Canada (Canadian Registration Number)	E60

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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 test report (EN 10204-2.2)	U01
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (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 test report (EN 10204-2.2)	U03
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)	U04

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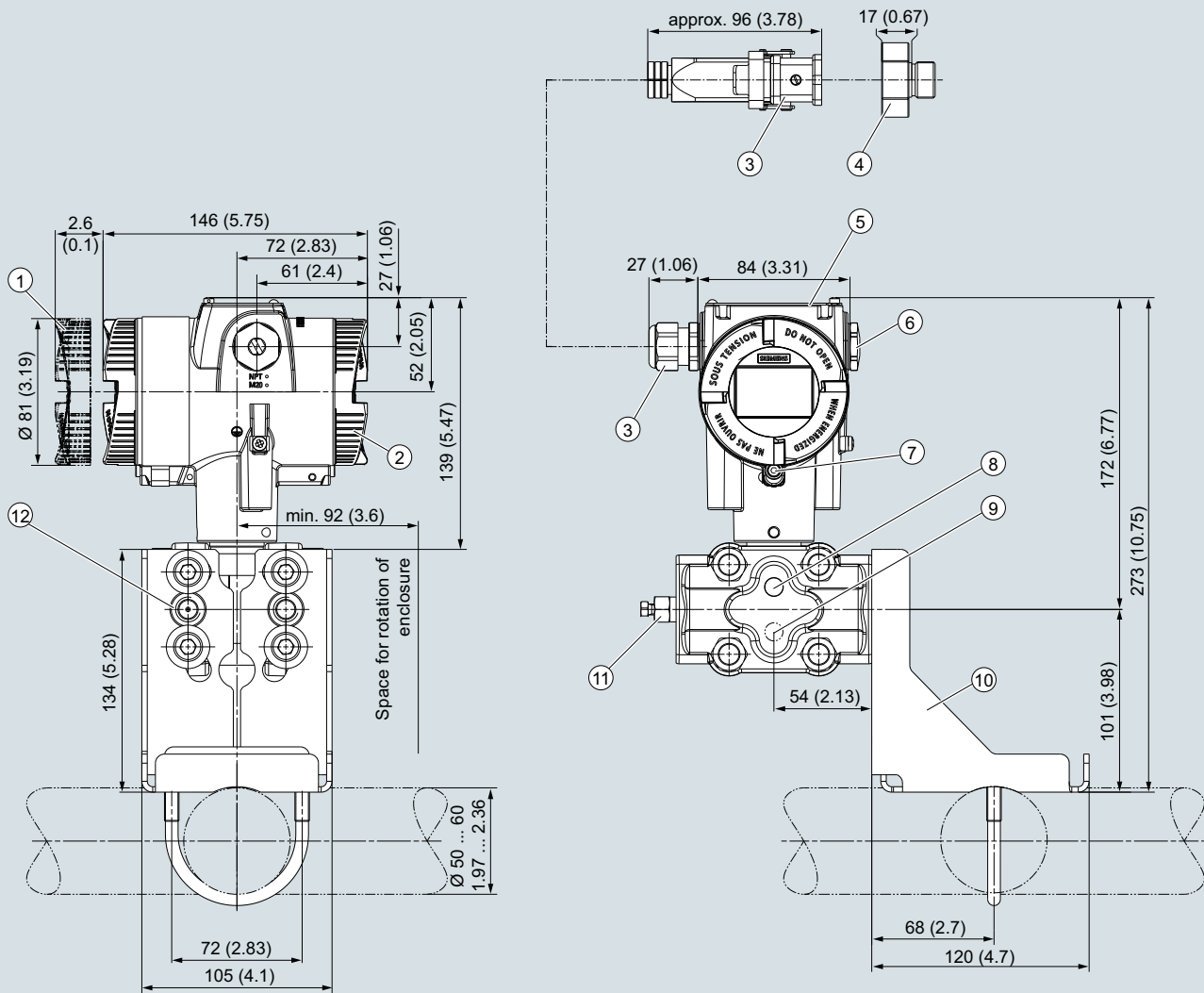
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Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Device settings	
<p>Measuring span</p> <p>Start of scale value (max. 5 characters), full scale value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi</p> <p>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).</p> <p>Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm², kg/cm², kgf/cm², inH₂O, inH₂O (4°C), ftH₂O, mmH₂O, mmH₂O (4°C), mH₂O (4°C), mmHg, inHg, atm, torr</p>	Y01
<p>Square-rooted characteristic [VSLN2, MSLN2], example: VSLN2</p> <p>Drop-down list: VSLN2, MSLN2</p>	Y02
<p>TAG</p> <p>(on stainless steel plate and device parameters, max. 32 characters)</p> <p>Input field: Free text, max. 32 characters</p>	Y15
<p>Measuring point description</p> <p>(on stainless steel plate and device parameters, max. 32 characters)</p> <p>Input field: Free text, max. 32 characters</p>	Y16
<p>TAG short</p> <p>(device parameters, max. 8 characters)</p> <p>Input field: Free text, max. 8 characters</p>	Y17
<p>Local display</p> <p>[Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge</p> <p>Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge</p>	Y21
<p>Local display</p> <p>Scaling with standard units</p> <p>[m³/s, l/s, m, inch, ...], example 1 ... 5 m³/s</p> <p>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).</p> <p>Drop-down list: m, cm, mm, in, ft, m³, l, hl, in³, ft³, yd³, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm³, NI, m³/sec, m³/h, m³/d, l/sec, l/min, l/h, Ml/d, ft³/sec, ft³/h, ft³/d, SCF/min, SCF/h, NI/h, Nm³/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.</p>	Y22
<p>Local display</p> <p>Scaling with user-specific units (max. 12 characters), example 1 ... 5 m</p> <p>Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).</p> <p>Input field 3: Free text, max. 8 characters</p>	Y23
<p>Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA</p> <p>Drop-down list 1: 3.9, 4</p> <p>Drop-down list 2: 20.8, 22</p>	Y30
<p>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</p> <p>Drop-down list: 3.75; 21.75; 22.5; 22.6</p>	Y31
<p>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</p> <p>Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.</p>	Y32
<p>ID number of special version</p> <p>Input field: max. 4 characters and only natural numbers from 0 ... 9999</p>	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 1,5³⁾ screw gland
• 1/2-14 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: 1/4-18 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)

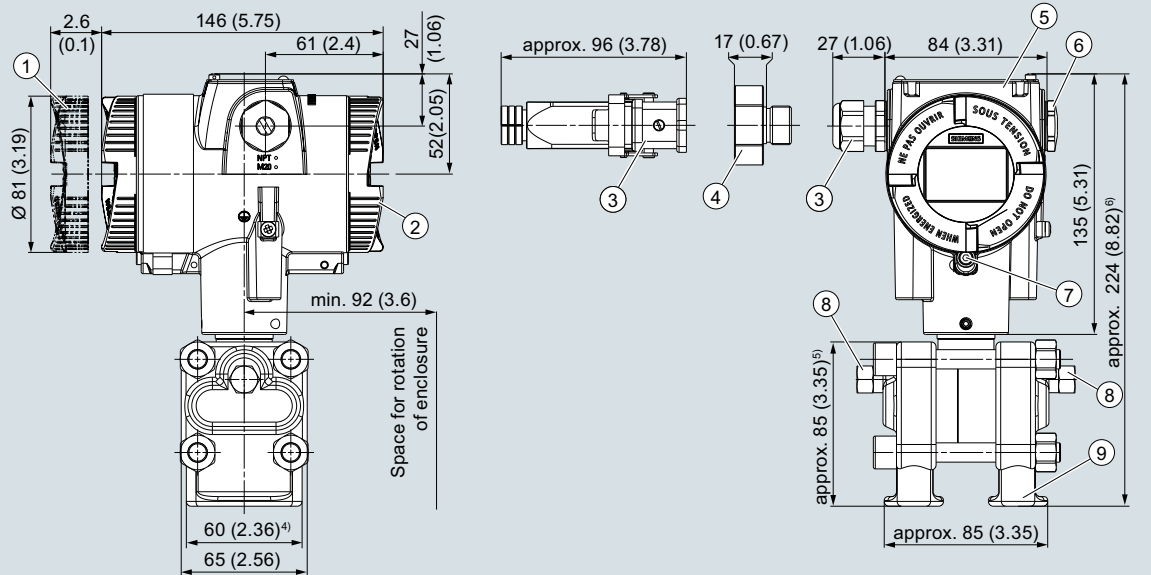
Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for differential pressure and flow



- ① Electronics side, local display
(longer overall length for cover with inspection window)¹⁾
- ② Connection side
- ③ Electrical connection:
 - M20 x 1,5³⁾ screw gland
 - ½-14 NPT screw gland
 - Han 7D/Han 8D²⁾ device plug
 - M12 device plug²⁾ 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
Span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	<div>Span</div> <div> <div>Max. permissible operating pressure MAWP (PS)</div> <div>See "Mounting flange"</div> <div>Maximum permissible test pressure</div> </div>
	25 ... 250 mbar 2.5 ... 25 kPa 10 ... 100.5 inH ₂ O 25 ... 600 mbar 2.5 ... 60 kPa 10 ... 241 inH ₂ O 53 ... 1600 mbar 5.3 ... 160 kPa 21 ... 643 inH ₂ O 166 ... 5000 mbar 16.6 ... 500 kPa 2.41 ... 72.5 psi
Measuring limits	
<ul style="list-style-type: none"> Low measuring limit <ul style="list-style-type: none"> Measuring cell with silicone oil filling Measuring cell with inert oil Measuring cell with FDA-compliant oil Upper measuring limit Start of scale 	-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange -100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange -100% of max. measuring range or 100 mbar a/10 kPa a/1.45 psi a 100% of max. span Between the measuring limits (infinitely adjustable)
Output	
Output signal	HART
<ul style="list-style-type: none"> Low saturation limit (infinitely adjustable) High saturation limit (infinitely adjustable) Ripple (without HART communication) 	4 ... 20 mA 3.55 mA, factory preset to 3.8 mA 22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA $I_{pp} \leq 0.5\%$ 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
<ul style="list-style-type: none"> Current transmitter Failure signal 	3.55 ... 22.8 mA 3.55 ... 22.8 mA
Load	Resistor R [Ω]
<ul style="list-style-type: none"> Without HART communication 	$R = (U_H - 10.5 \text{ V}) / 22.8 \text{ mA}$, U_H : Power supply in V $R = 230 \dots 1100 \Omega$ (HART communicator (handheld)) $R = 230 \dots 500 \Omega$ (SIMATIC PDM)
<ul style="list-style-type: none"> With HART communication 	
Characteristic curve	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> According to EN 60770-1 Rising characteristic curve Start of scale 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)	$r = \text{maximum measuring span/set measuring span or nominal measuring range}$
<ul style="list-style-type: none"> Linear characteristic <ul style="list-style-type: none"> 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 	$r \leq 5$: $\leq 0.125\%$ $5 < r \leq 10$: $\leq (0.007 \cdot r + 0.09)\%$

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for level

SITRANS P320 / SITRANS P420 for level

Influence of ambient temperature
in % per 28 °C (50 °F)

• SITRANS P320 $\leq (0.025 \cdot r + 0.125)\%$

- 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 $\leq (0.025 \cdot r + 0.0625)\%$

- 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

Effect of static pressure

- on the start of scale
 - 250 mbar/25 kPa/3.63 psi $\leq (0.3 \cdot r)\%$ per nominal pressure
 - 600 mbar/60 kPa/8.70 psi $\leq (0.15 \cdot r)\%$ per nominal pressure
 - 1.6 bar/160 kPa/23.21 psi
 - 5 bar/500 kPa/72.52 psi
- on the span $\leq (0.1 \cdot r)\%$ per nominal pressure

Long-term stability at ± 30 °C (± 54 °F)

- all measuring cells In 5 years $\leq (0.25 \cdot r)\%$ 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

Rated 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
 - Measuring cell with silicone oil filling
 - Display
- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection
 - According to IEC 60529
 - According to NEMA 250
- Electromagnetic compatibility
 - Emitted interference and interference immunity

Always consider the assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection.
-40 ... +85 °C (-40 ... +185 °F)
-20 ... +80 °C (-4 ... +176 °F)
-50 ... +85 °C (-58 ... +185 °F)
4K4H

IP66, IP68
Type 4X

According to IEC 61326 and NAMUR NE 21

Vibration resistance

- Reference conditions
- General operating conditions

- Oscillations (sine) IEC 60068-2-6

Specifications apply to devices without mounting bracket

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
250 m/s² (820 ft/s²)
6 ms
2000 shocks/axis
10 ... 200 Hz; 1 (m/s²)/Hz (3.28 (ft/s²)/Hz)
200 ... 500 Hz; 0.3 (m/s²)/Hz (0.98 (ft/s²)/Hz)
4 hours/axle

- Continuous shocks (half-sine) IEC 60068-2-27

- Noise (digitally controlled) IEC 60068-2-64

- Rated 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 housing

- Low-copper die-cast aluminum GD-AISI 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
- Low-pressure side

Flange according to EN and ASME

1/4-18 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
- 1/2-14 NPT
- Device plug Han 7D/Han 8D¹⁾
- 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

 $U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)

Noise

 $U_{eff} \leq 1.2 \text{ mV}$ (0.5 ... 10 kHz)

Auxiliary power

—

Separate supply voltage

—

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for level

SITRANS P320 / SITRANS P420 for level

Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)

Drinking water

- WRAS (England)
- ACS (France)
- NSF (USA)

CRN (Canada)

Explosion protection acc. to NEPSI (China)

Explosion protection acc. to INMETRO (Brazil)

Explosion protection

- Intrinsic safety "i"
 - Marking
 - Permissible ambient temperature
 - Permissible temperature of measuring medium
 - Connection
- Effective internal inductance/capacitance
- Flameproof enclosure "d"
 - Marking
 - Permissible ambient temperature
 - Permissible temperature of measuring medium
 - Connection
- Dust explosion protection for zones 20, 21, 22
 - Marking
 - Permissible ambient temperature
 - Permissible temperature of measuring medium
 - Max. surface temperature
 - Connection
- Dust explosion protection for zones 21, 22
 - Marking
 - Permissible ambient temperature
 - Permissible temperature of measuring medium
 - Connection
- Effective internal inductance/capacitance
- Type of protection for Zone 2
 - Marking
 - Permissible ambient temperature "ec"
 - Permissible ambient temperature "ic"
 - Permissible temperature of measuring medium
 - "ec" connection
 - "ic" connection

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

No.: 1903094 (option E83)

No.: 18 ACC LY 277 (option E85)

No.: 20180920-MH61350 (option E84)

No.: 0F9863.5C (option E60)

No.: GYJ19.1058X (option E27)

No.: BRA-18-GE-0035X (option E25)

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To certified intrinsically safe circuits with peak values:

$U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

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

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

120 °C (248 °F)

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

Ex II 2D Ex ib IIIC T120 °C Db

Ex II 3D Ex ic IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

Ex II 3G Ex ec IIC T4/T6 Gc

Ex II 3G Ex ic IIC T4/T6 Gc

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +40 °C (-40 ... +104 °F) temperature class T6

-40 ... +80 °C (-40 ... +176 °F) temperature class T4

-40 ... +80 °C (-40 ... +176 °F) temperature class T6

-40 ... +100 °C (-40 ... +212 °F) temperature class T4

-40 ... +70 °C (-40 ... +158 °F) temperature class T6

To a circuit with the operating values:

$U_n = 10.5 \text{ to } 30 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$

$U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$

Effective internal inductance/capacitance:

$L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$

SITRANS P320 / SITRANS P420 for level

- Explosion protection acc. to FM
 - Marking (XP/DIP) or IS; NI; S

Available soon

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
 - Marking (XP/DIP) or (IS)

Available soon

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
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

Standardized Electrical Signals and Questions Relating to Engineering Technology

Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment

Extra Low Voltage Circuits with Safe Separation

Standardization of the Signal Level for the Failure Information of Digital Transmitters

Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics

The Application of the Pressure Equipment Directive to Process Control Devices

Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices

Self-Monitoring and Diagnosis of Field Devices

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

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P320/P420

for level

1

Selection and ordering data

Article No.

Pressure transmitters for level

SITRANS P320

7MF036 - - - - -

SITRANS P420

7MF046 - - - - -

➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.

Communication

HART, 4 ... 20 mA

Measuring cell filling

Silicone oil

Maximum measuring span

250 mbar (100.5 inH₂O)

600 mbar (241 inH₂O)

1 600 mbar (643 inH₂O)

5000 mbar (72.5 psi)

Process connection

Version for diaphragm seal with mounting thread 7/16"-20 UNF (IEC 61518):
Remote seal 7MF0814 must be ordered separately.

Wetted parts materials: Process connection, seal diaphragm

Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408

Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

Enclosure

Dual chamber device

Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2

Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2

Combination of options B, C and L (zone model)

Combination of options B, C and M (zone model, Class Division)

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 1/2-14 NPT

Local operation/display

Without display (cover closed)

With display (cover closed)

With display (cover with glass pane)

0

1

G

H

M

P

V

0

1

2

5

A

B

C

D

L

M

S

T

F

M

0

1

2

Selection and ordering data

Options	Order code	Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.		Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included		Device options	
Plastic	A00	PDF file with device settings	D10
Metal	A01	Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	D20
Stainless steel	A02	FVMQ enclosure sealing	D21
Stainless steel 316L/1.4404	A03	IP66/IP68 degree of protection (not for device plugs M12 and Han)	D30
CMP, for XP devices	A10	TAG label empty	D40
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11	Without labeling of the measuring range on the TAG label	D41
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12	Stainless steel Ex plate 1.4404/316L	D42
Device plug Han mounted left		Overvoltage protection up to 6 kV (external)	D71
Device plug Han 7D (plastic, straight)	A30	Adhesive labels on transport packaging (supplied by customer)	D90
Device plug Han 7D (plastic, angled)	A31		
Device plug Han 7D (metal, straight)	A32	General approval without Ex approval	
Device plug Han 7D (metal, angled)	A33	Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Device plug Han 8D (plastic, straight)	A34	Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
Device plug Han 8D (plastic, angled)	A35	CSA (USA and Canada)	E06
Device plug Han 8D (metal, straight)	A36	EAC	E07
Device plug Han 8D (metal, angled)	A37	FM	E08
Cable socket included		KCC	E09
Plastic, for device plug Han 7D and Han 8D	A40	Export approval CPA (China)	E12
Metal, for device plug Han 7D and Han 8D	A41	Explosion protection approvals	
Device plug M12 mounted left		ATEX (Europe)	E20
Stainless steel, without cable socket	A62	CSA (USA and Canada)	E21
Stainless steel, with cable socket	A63	FM (USA and Canada)	E22
Cable entry/connector mounting		IECEx (Worldwide)	E23
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90	EACEx (GOST-R, -K, -B)	E24
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91	INMETRO (Brazil)	E25
Cable gland/connector mounted left	A97	KCs (Korea)	E26
Cable gland/connector mounted on right	A99	NEPSI (China)	E27
Nameplate labeling (standard labeling: English, unit bar)		PESO (India)	E28
German (bar)	B11	UKR Sepro (Ukraine)	E30
French (bar)	B12	ATEX (Europe) and IECEx (Worldwide)	E47
Spanish (bar)	B13	CSA (Canada) and FM (USA)	E48
Italian (bar)	B14	ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	E49
Chinese (bar)	B15	Marine approvals	
Russian (bar)	B16	DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
English (psi)	B20	LR (Lloyds Register)	E51
English (Pa)	B30	BV (Bureau Veritas)	E52
Chinese (Pa)	B35	ABS (American Bureau of Shipping)	E53
Certificates		RMR (Russian Maritime Register)	E55
Quality test certificate, 5-point factory calibration (IEC 60770-2)	C11	KR (Korean Register of Shipping)	E56
Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12	RINA (Registro Italiano Navale)	E57
Test report - NACE (MR 0103-2012 and MR 0175-2009)	C13	CCS (China Classification Society)	E58
Test report (EN 10204-2.2) - Wetted parts	C14	Country-specific approvals	
Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15	CRN approval Canada (Canadian Registration Number)	E60
Certificates for functional safety			
Functional safety (IEC 61508) - SIL2/3	C20		

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for level

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 Start of scale value (max. 5 characters), full scale 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 , NI.	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

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)		03 - 0	
Scope of delivery: 1 off			
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		9AA	H1Y
Add Order code and plain text			
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)		03 - 0	
Scope of delivery: 1 off			
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:		Z	P1Y
Filling liquid: ...			
Wetted parts materials			
Stainless steel 316L			
• Without coating		A	
• With PFA coating		D	
• With PTFE coating		E0	
• With ECTFFE 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		Z8	Q1Y
Add Order code and plain text			
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		Z8	Q1Y
Add Order code and plain text			

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for level

1

Selection and Ordering data

Article No.

Order
code

Diaphragm seal

Flange type design, direct connected to a SITRANS P transmitter for level
7MF03../7MF04.. (order separately)
Scope of delivery: 1 off

7MF0814 -

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

Flange type design, direct connected to a SITRANS P transmitter for level
7MF03../7MF04.. (order separately)
Scope of delivery: 1 off

7MF0814 -

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

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P320/P420

for level

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Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Further designs	
Add "-Z" to Article No. and specify Order code.		Add "-Z" to Article No. and specify Order code.	
Factory certificates		Remote seal connection	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	C11	Elongated pipe, 150 mm (5.9 inch) instead of 100 mm (3.9 inch)	S05
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	C12	Elongated pipe, 200 mm (7.9 inch) instead of 100 mm (3.9 inch)	S06
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	Customer-specific tube length	
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	C15	Customer-specific tube length (specify in plain text)	Y44
Certificate of FDA-approved fill oil (to EN10204-2.2)	C17	Specification of process conditions¹⁾	
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)	C20	Ambient temperature range	
Accessories		• -10 ... +50 °C (14 ... +122 °F) preset	D66
Spark arrestor (for differential pressure and level transmitter)	D62	• -40 ... +50 °C (-40 ... +122 °F)	D67
Low-temperature version (for Silicon Oil M50 only)	D67	• -10 ... +85 °C (14 ... +185 °F)	D68
Negative pressure services		Process temperature min. ... °C/(°F)/max. ... °C/(°F)	Y50
Certification acc. to NACE MR-0103	D83		
Includes acceptance test certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	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		

¹⁾ See also "Specification of process conditions for selection and ordering data", page 1/338.

Pressure Measurement

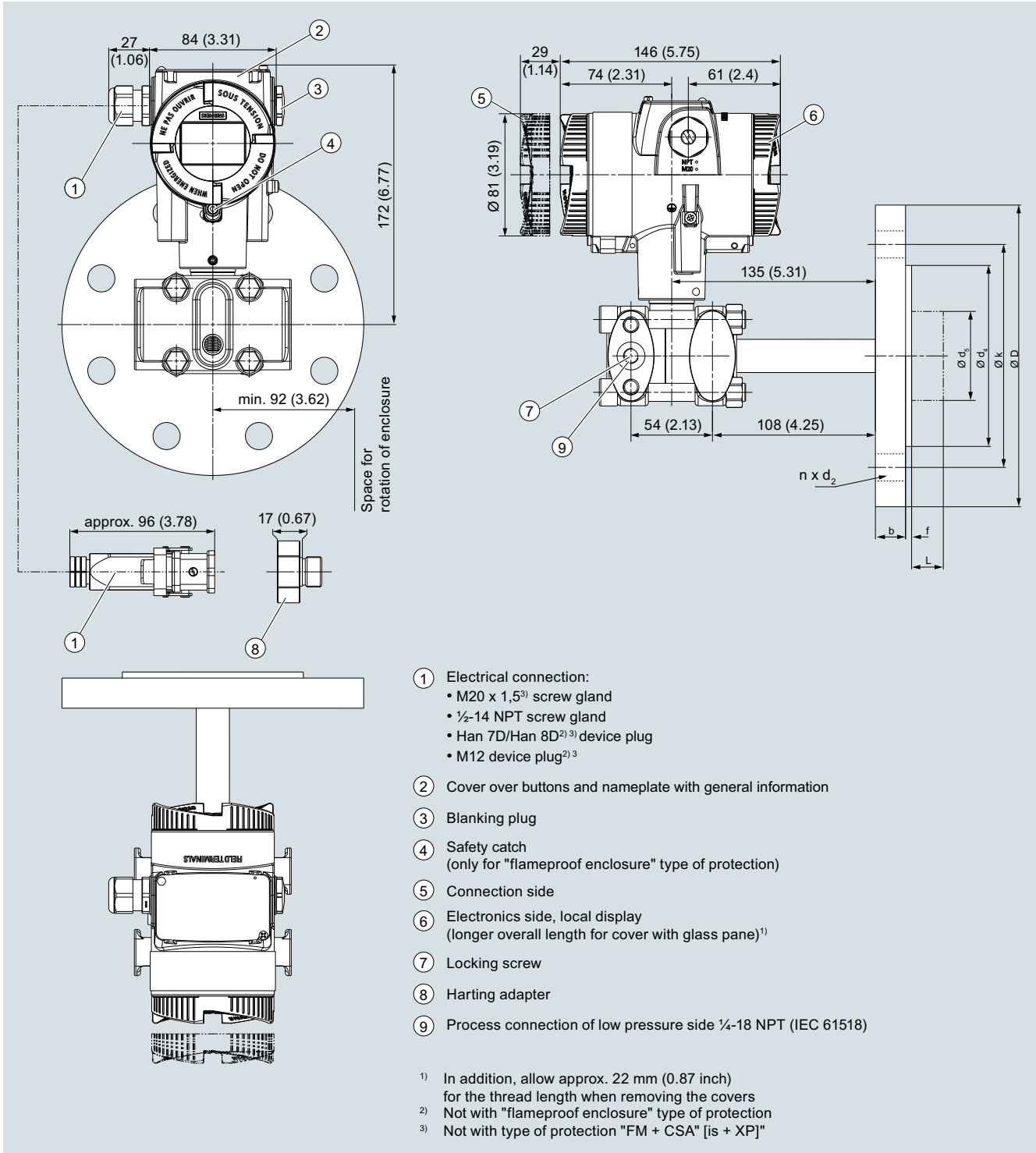
Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for level

Dimensional drawings



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

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	

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for level

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

Overview



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

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

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

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

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

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

Benefits

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

- Infinitely adjustable span from 0.01 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 Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

Technical description

Pressure transmitter for gauge pressure

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

Span (infinitely adjustable)

for DS III with HART: 0.01 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.

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 $q \sim \sqrt{\Delta p}$ (together with a primary differential pressure device (see Chapter "Flow Meters"))

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.

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

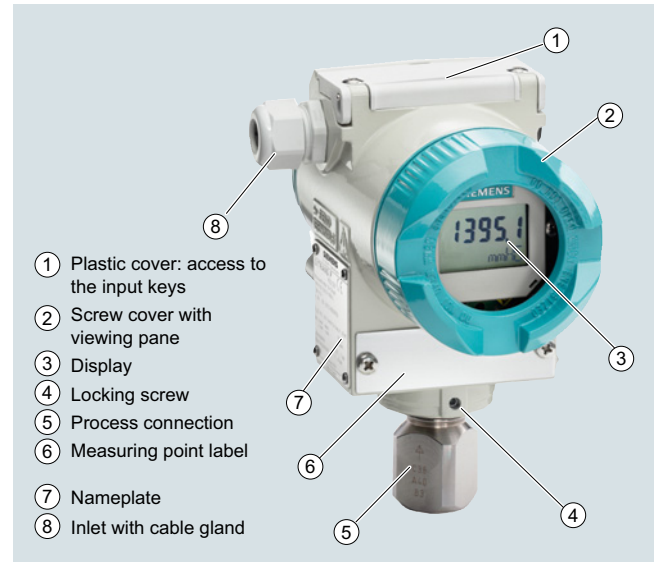
- DN 80 or DN 100
- 3 inch or 4 inch

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 housing. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

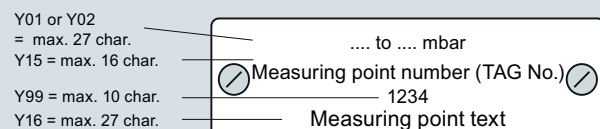
The approval label is located on the opposite side.

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

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

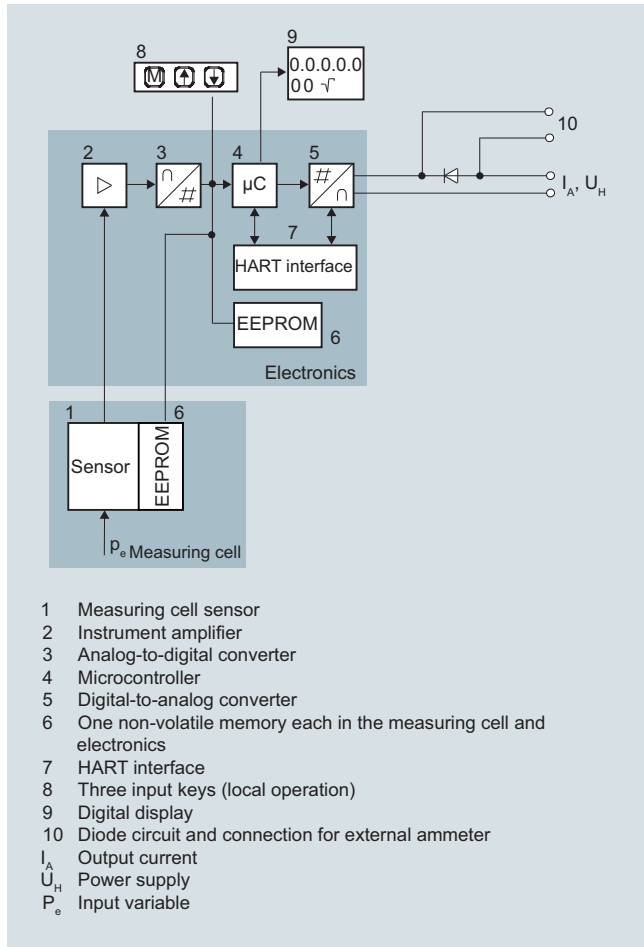
At the top of the housing is a plastic cover (1), which hides the input keys.

Example for an attached measuring point label



Function

Operation of electronics with HART communication



Function diagram of electronics

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

The diode circuit (10) protects against incorrect polarity.

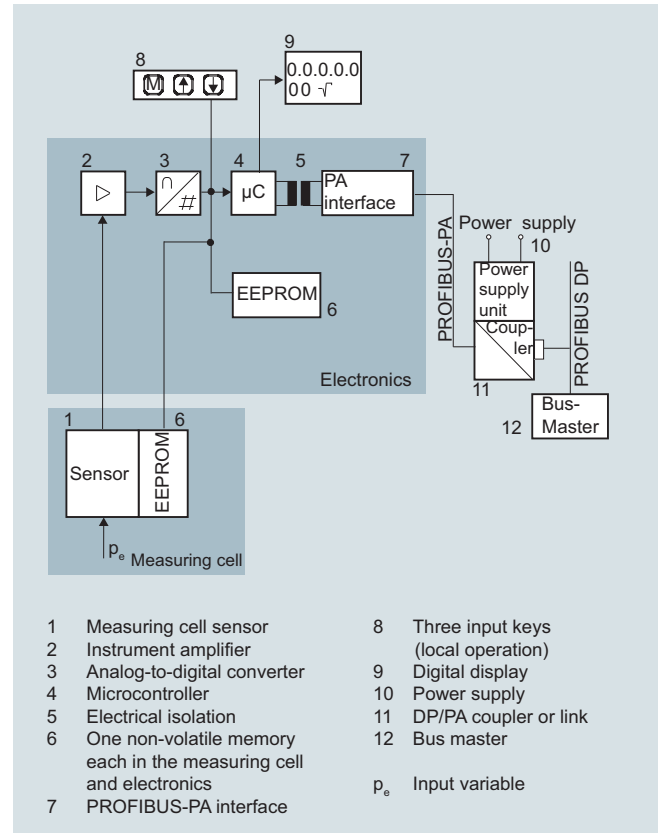
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

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

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

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

Operation of electronics with PROFIBUS PA communication



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.

Pressure Measurement

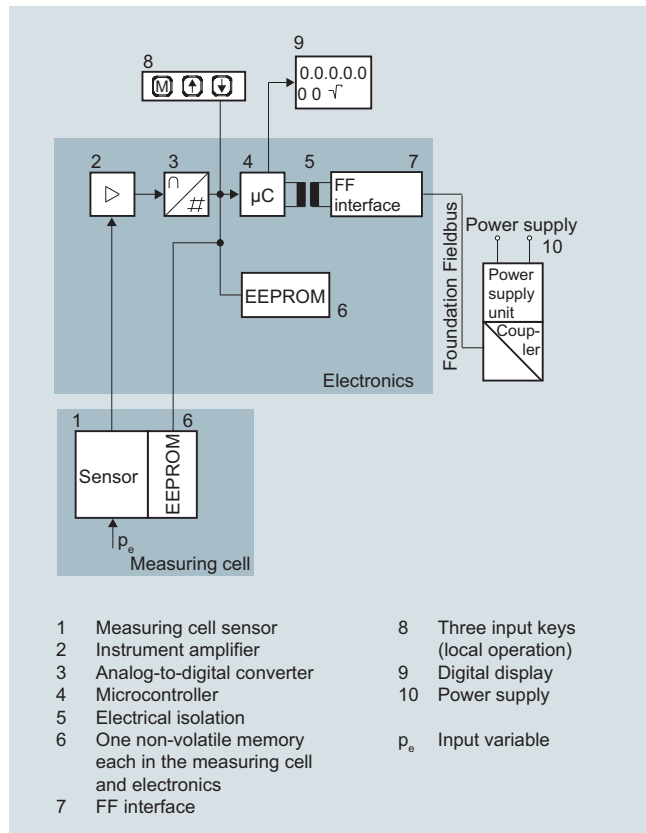
Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

Technical description

Operation of electronics with FOUNDATION Fieldbus communication



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).

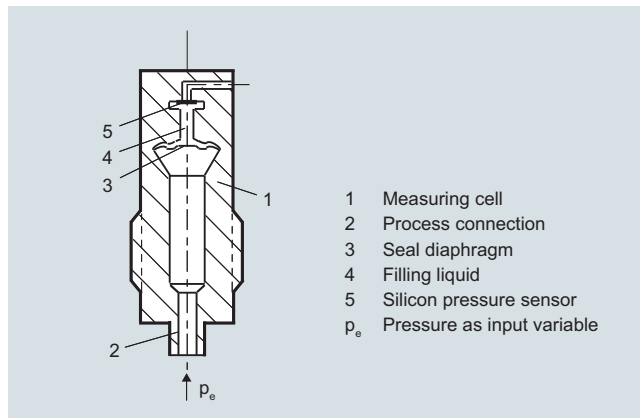
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

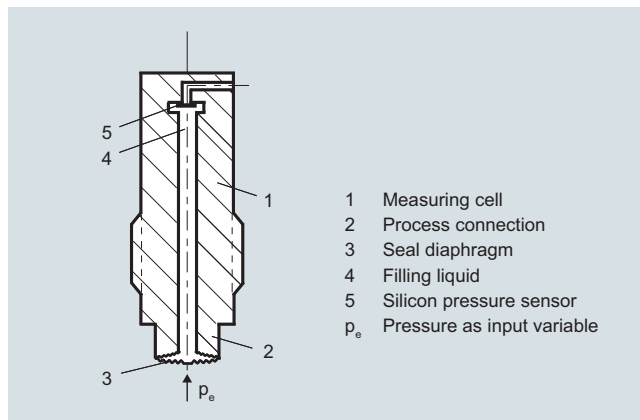
Measuring cell for gauge pressure



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.

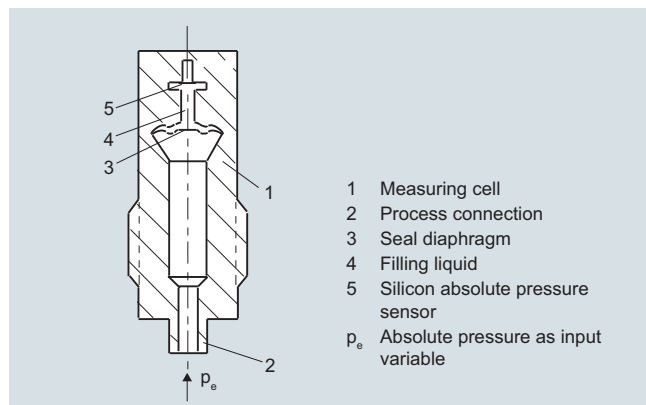
Measuring cell for gauge pressure with front-flush diaphragm



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.

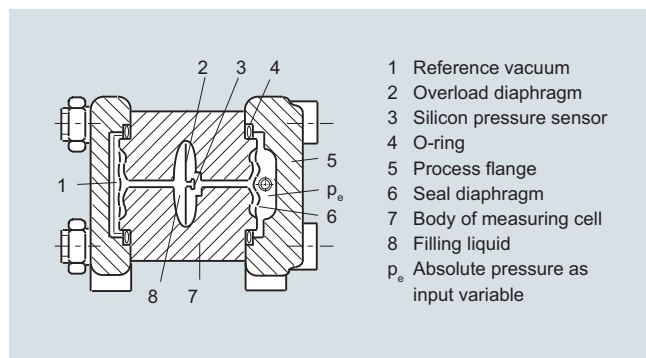
Measuring cell for absolute pressure from gauge pressure series



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



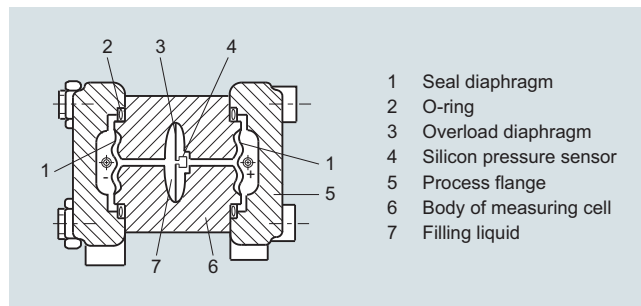
Measuring cell for absolute pressure from differential pressure series, function diagram

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



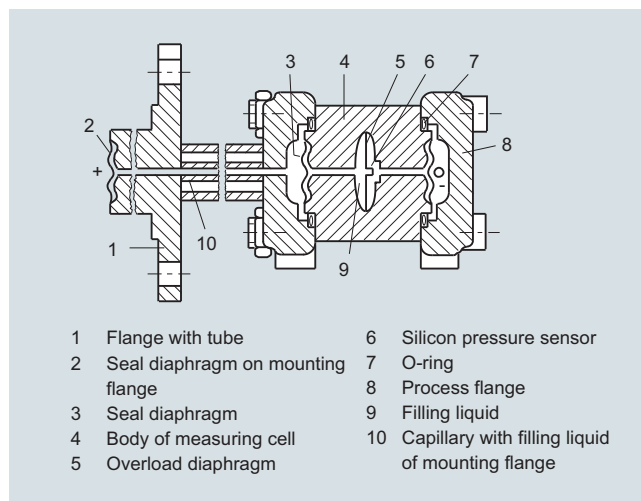
Measuring cell for differential pressure and flow, function diagram

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



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.

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

Technical description

Parameterization DS III

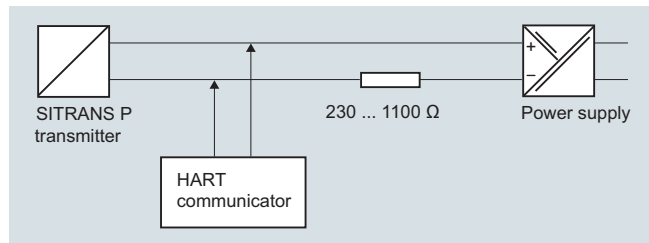
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

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

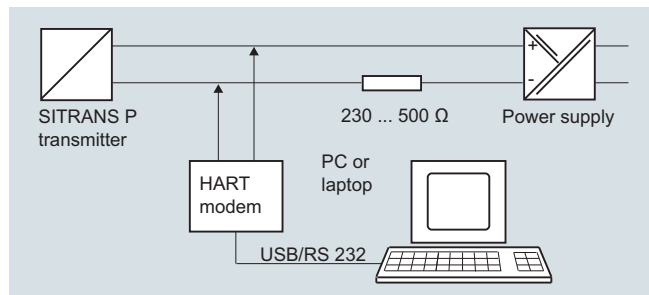
Parameterization using HART

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
Start of scale	x	x
Full-scale value	x	x
Electrical damping	x	x
Start-of-scale value without application of a pressure ("Blind setting")	x	x
Full-scale value without application of a pressure ("Blind setting")	x	x
Zero adjustment	x	x
current transmitter	x	x
Fault current	x	x
Disabling of buttons, write protection	x	x ¹⁾
Type of dimension and actual dimension	x	x
Characteristic (linear / square-rooted)	x ²⁾	x ²⁾
Input of characteristic		x
Freely-programmable LCD		x
Diagnostic functions		x

¹⁾ Cancel apart from write protection

²⁾ Only differential pressure

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

Parameterization through PROFIBUS PA interface

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

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

Parameterization through FOUNDATION Fieldbus interface

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

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

Adjustable parameters for 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

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 ₂ O, mmH ₂ O (4 °C), inH ₂ O, inH ₂ O (4 °C), ftH ₂ O (20 °C), mmHg, inHg
Level (height data)	m, cm, mm, ft, in, yd
Volume	m ³ , dm ³ , hl, yd ³ , ft ³ , in ³ , US gallon, Imp. gallon, bushel, barrel, barrel liquid
volume flow	m ³ /s, m ³ /min, m ³ /h, m ³ /d, l/s, l/min, l/h, l/d, Ml/d, ft ³ /s, ft ³ /min, ft ³ /h, ft ³ /d, US gallon/s, US gallon/min, US gallon/h, US gallon/d, bbl/s, bbl/min, bbl/h, bbl/d
Mass flow	g/s, g/min, g/h, g/d, kg/s, kg/min, kg/h, kg/d, t/s, t/min, t/h, t/d, lb/s, lb/min, lb/h, lb/d, STon/s, STon/min, STon/h, STon/d, LTon/s, LTon/min, LTon/h, LTon/d
Total mass flow	t, kg, g, lb, oz, LTon, STon
Temperature	K, °C, °F, °R
Miscellaneous	%

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

1

Technical specifications

SITRANS P, DS III series for gauge pressure

Input

Measured variable

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

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

Gauge pressure

HART

PROFIBUS PA/ FOUNDATION Fieldbus

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 up to 30 mbar a/3 kPa a/0.44 psi a.)

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

Upper measuring limit

30 mbar a/3 kPa a/0.44 psi a

30 mbar a/3 kPa a/0.44 psi a

100% of max. span (max. 100 bar/10 MPa/1450 psi for oxygen measurement) ambient temperature/process temperature 60 °C (140 °F)

Output

Output signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

Load

- Without HART
- With HART

Physical bus

Protection against polarity reversal

Electrical damping (step width 0.1 s)

HART

4 ... 20 mA

3.55 mA, factory preset to 3.84 mA
23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω ,
 U_H : Power supply in V

$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) bzw.
 $R_B = 230 \dots 1100 \Omega$ (HART-Communicator)

-

Protected against short-circuit and polarity reversal.
Each connection against the other with max. supply voltage.

Set to 2 s (0 ... 100 s)

PROFIBUS PA/FOUNDATION Fieldbus

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

-

-

-

-

IEC 61158-2

SITRANS P, DS III series for gauge pressure**Measuring accuracy**

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

• Linear characteristic

- 250 mbar/25 kPa/3.6 psi

 $r \leq 1.25 :$ $\leq 0.065 \%$
 $1.25 < r \leq 30 :$ $\leq (0.008 \cdot r + 0.055) \%$

- 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

 $r \leq 5 :$ $\leq 0.065 \%$
 $5 < r \leq 100 :$ $\leq (0.004 \cdot r + 0.045) \%$

- 400 bar/40 MPa/5802 psi
 700 bar/70 MPa/10152 psi

 $r \leq 3 :$ $\leq 0.075 \%$
 $3 < r \leq 10 :$ $\leq (0.0029 \cdot r + 0.071) \%$
 $10 < r \leq 100 :$ $\leq (0.005 \cdot r + 0.05) \%$
Influence of ambient temperature
(in percent per 28 °C (50 °F))

• 250 mbar/25 kPa/3.6 psi

 $\leq (0.16 \cdot r + 0.1) \%$

• 1 bar/100 kPa/14.5 psi

 $\leq (0.05 \cdot r + 0.1) \%$

• 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

 $\leq (0.025 \cdot r + 0.125) \%$

• 700 bar/70 MPa/10152 psi

 $\leq (0.08 \cdot r + 0.16) \%$ Long-term stability (temperature change ± 30 °C (± 54 °F))

• 250 mbar/25 kPa/3.6 psi

 $\leq (0.25 \cdot r) \%$ per year

• 1 bar/100 kPa/14.5 psi
 4 bar/400 kPa/58 psi

 $\leq (0.25 \cdot r) \%$ 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

 $\leq (0.125 \cdot r) \%$ in 5 years

• 700 bar/70 MPa/10152 psi

 $\leq (0.25 \cdot r) \%$ in 5 years

Effect of mounting position

 $\leq 0.05 \text{ mbar}/0.005 \text{ kPa}/0.000725 \text{ psi}$ 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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

1

SITRANS P, DS III series for gauge pressure

Rated conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid

-40 ... +100 °C (-40 ... +212 °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

-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 G $\frac{1}{2}$ B to DIN EN 837-1, female thread $\frac{1}{2}$ -14 NPT or oval flange (PN 160 (MAWP 2320 psi)) to DIN 19213 with mounting thread M10 or $\frac{7}{16}$ -20 UNF to IEC 61518/DIN EN 61518

Material of mounting bracket

- Steel
- Stainless steel 304
- Stainless steel 316L

Sheet-steel, Mat. No. 1.0330, chrome-plated

Sheet stainless steel, mat. no. 1.4301 (SS 304)

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

Power supply U_H

Terminal voltage on transmitter

10.5 ... 45 V DC
10.5 ... 30 V DC in intrinsically-safe mode

PROFIBUS PA/FOUNDATION Fieldbus

-

Power supply

-

Supplied through bus

Separate 24 V power supply

-

Not necessary

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

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	PTB 13 ATEX 2007 X	
• Intrinsic safety "i"	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Marking	-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	
- Permissible ambient temperature	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$	
- Connection	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 174 \text{ mA}$, $P_o = 1 \text{ W}$ $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
- Effective internal inductance/capacitance	PTB 99 ATEX 1160	
• Explosion-proof "d"	Ex II 1/2 G Ex d IIC T4/T6 Gb	
- Marking	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6	
- Permissible ambient temperature	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$	
- Connection	PTB 01 ATEX 2055	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	Ex II 1 D Ex ta IIIC T120°C Da Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db	
- Marking	-40 ... +85 °C (-40 ... +185 °F)	
- Permissible ambient temperature	120 °C (248 °F)	
- Max. surface temperature	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	
- Connection	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1 \text{ W}$ $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
- Effective internal inductance/capacitance	PTB 01 ATEX 2055	
• Dust explosion protection for zone 21/22	Ex II 2 D Ex tb IIIC T120°C Db	
- Marking	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$	
- Connection	PTB 13 ATEX 2007 X	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$
• Type of protection "n" (zone 2)	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	
- Marking	$U_m = 45 \text{ V}$	
- Connection (Ex nA)	To circuits with values: $U_i = 45 \text{ V}$	
- Connections (Ex ic)	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$U_m = 32 \text{ V}$ FISCO supply unit ic: $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$ $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
- Effective internal inductance/capacitance	Certificate of Compliance 3008490	
• Explosion protection acc. to FM	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 (XP/DIP) or (IS); (NI)	Certificate of Compliance 1153651	
• Explosion protection to CSA	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	
- Identification (XP/DIP) or (IS)		

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P DS III

for gauge pressure

HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
PROFIBUS PA communication		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge) parameterizable (last good value, substitute value, incorrect value)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	Yes, one upper and lower warning limit and one alarm limit respectively
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes
Cyclic data usage		- Limit monitoring	Standard FOUNDATION Fieldbus function block
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	1 resource block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 transducer block Pressure with calibration, 1 transducer block LCD
Internal preprocessing		• Physical block	
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- 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		

Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
Pressure transmitter for gauge pressure, SITRANS P DS III with HART		7MF4033 -	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.			Explosion protection		
Measuring cell filling			<ul style="list-style-type: none"> None 		A
Measuring cell cleaning			<ul style="list-style-type: none"> With ATEX, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety (Ex ia)" "Explosion-proof (Ex d)"⁸⁾ "Intrinsic safety and flameproof enclosure (Ex ia + Ex d)"⁹⁾ "Ex nA/ic (Zone 2)"¹⁰⁾ "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"⁹⁾¹¹⁾ FM + CSA intrinsic safe (is)¹²⁾ FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D⁹⁾¹¹⁾¹²⁾ With FM + CSA, Type of protection: <ul style="list-style-type: none"> "Intrinsic Safe and Explosion Proof (is + xp)"⁸⁾¹²⁾ 		B D P E R F S
Silicone oil	normal	1	Electrical connection / cable entry		
Inert liquid ¹⁾	grease-free to cleanliness level 2	3	<ul style="list-style-type: none"> Screwed gland M20 x1 .5 Screwed gland ½-14 NPT Device plug Han 7D (plastic housing) incl. mating connector¹³⁾ Device plugs M12 (stainless steel)¹³⁾¹⁴⁾ 		B C D F
FDA compliant fill fluid ²⁾			Display		
• Neobee oil	normal	4	<ul style="list-style-type: none"> Without display Without visible display (display concealed, setting: mA) With visible display (setting: mA) with customer-specific display (setting as specified, Order code "Y21" or "Y22" required) 		0 1 6 7
Measuring span (min. ... max.)			Power supply units see Chap. 7 "Supplementary Components".		
8.3 ... 250 mbar	(0.12 ... 3.6 psi)	A	A quick-start guide is included in the scope of delivery of the device.		
0.01 ... 1 bar	(0.15 ... 14.5 psi)	B	¹⁾ For oxygen application, add Order code E10.		
0.04 ... 4 bar	(0.58 ... 58 psi)	C	²⁾ Available for measuring ranges 1 ... 63 bar.		
0.16 ... 16 bar	(2.32 ... 232 psi)	D	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 <u>total</u> combination is certified here.		
0.63 ... 63 bar	(9.14 ... 914 psi)	E	⁴⁾ If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
1.6 ... 160 bar	(23.2 ... 2320 psi)	F	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		
4.0 ... 400 bar	(58.0 ... 5802 psi)	G	⁶⁾ The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.		
7.0 ... 700 bar	(102.0 ... 10153 psi)	J	⁷⁾ Not in conjunction with Electrical connection "Device plug Han 7D".		
Wetted parts materials			⁸⁾ Without cable gland, with blanking plug		
Seal diaphragm	Process connection		⁹⁾ With enclosed cable gland Ex ia and blanking plug		
Stainless steel	Stainless steel	A	¹⁰⁾ Configurations with device plugs Han and M12 are only available in Ex ic.		
Hastelloy	Stainless steel	B	¹¹⁾ Only in connection with IP66.		
Hastelloy	Hastelloy	C	¹²⁾ Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" (recommended version) ^{3) 4) 5) 6)}		Y 1	¹³⁾ Only in connection with Ex approval A, B or E.		
Version for diaphragm seals in conjunction with process connector "G½B connection shank" ^{3) 4) 5) 6)}		Y 0	¹⁴⁾ M12 delivered without cable socket		
Process connection					
<ul style="list-style-type: none"> Connection shank G½B to EN 837-1 Female thread ½-14 NPT Stainless steel oval flange with process connection (Oval flange has no female thread) <ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M10 to DIN 19213 Mounting thread M12 to DIN 19213 Male thread M20 x 1.5 Male thread ½-14 NPT 		0 1 2 3 4 5 6			
Non-wetted parts materials					
<ul style="list-style-type: none"> Housing made of die-cast aluminium Housing stainless steel precision casting⁷⁾ 		0 3			
Version					
<ul style="list-style-type: none"> Standard version, German plate inscription, setting for pressure unit: bar International version, English plate inscription, setting for pressure unit: bar Chinese version, English plate inscription, setting for pressure unit: Pascal 		1 2 3			
All versions include DVD with compact operating instructions in various EU languages.					

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

1

Selection and Ordering data		Article No.
Pressure transmitter for gauge pressure		
SITRANS P DS III with PROFIBUS PA (PA)		7 MF 4 0 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 MF 4 0 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
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 1/2-14 NPT" (recommended version) ^{3) 4) 5) 6)}		Y 1
Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" ^{3) 4) 5) 6)}		Y 0
Process connection		
• Connection shank G1/2B to EN 837-1		0
• Female thread 1/2-14 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 1/2-14 NPT		6
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing stainless steel precision casting		3
Version		
• Standard version, 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)		7 MF 4 0 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 MF 4 0 3 5 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		
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 1/2-14 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 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 <u>total</u> combination is certified here. ⁴⁾ If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals. ⁵⁾ 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. span 160 bar (2320 psi) 7/16-20 UNF and M12 fastening thread: Max. 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.		

Selection and Ordering data	Order code			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
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 plugs¹⁾				
• 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 ₂ O and/or psi	B21	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2²⁾	C11	✓	✓	✓
Inspection certificate³⁾ Acc. to EN 10204-3.1	C12	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	C14	✓	✓	✓
Acceptance certificate (EN 10204-3.1) PMI test of parts in contact with medium	C15	✓	✓	✓
Functional safety (SIL2) 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/2D⁵⁾ (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			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
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 casing and cover (PU on epoxy)	G10	✓	✓	✓
Transient protector 6 kV (lightning protection)	J01	✓	✓	✓
Process connection Astava	J06	✓	✓	✓

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge pressure

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

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

4) 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:	Y15²⁾	✓	✓	✓
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 ₂ O ³⁾ , inH ₂ O ³⁾ , ftH ₂ O ³⁾ , 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 units³⁾ 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

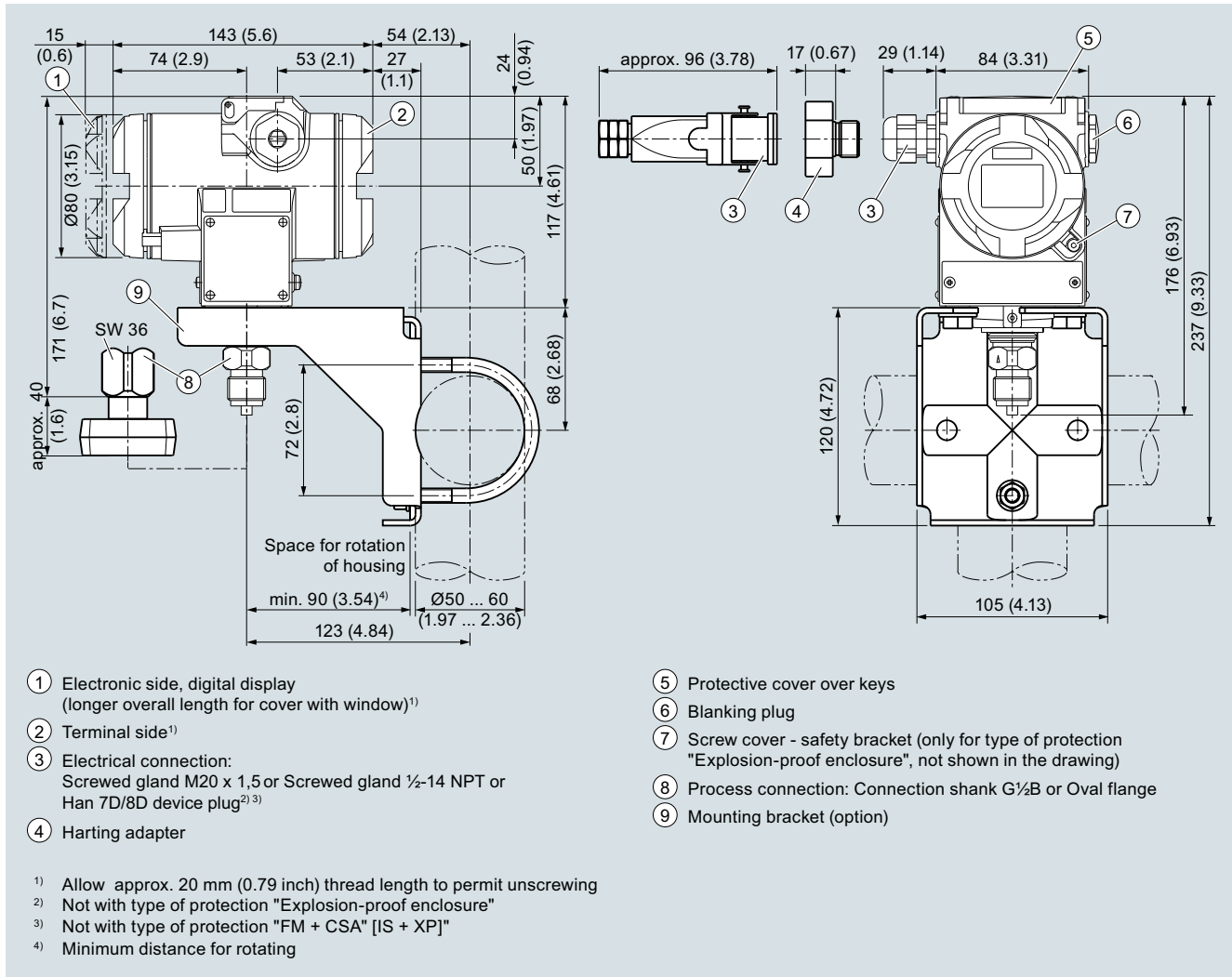
Ordering example

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

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

1

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

Span (continuously adjustable) or measuring range, max. operating pressure and max. test pressure

Gauge pressure, front-flush

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

Lower measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
- Measuring cell with Neobee

Upper measuring limit

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

100 % of max. span

Input of absolute pressure, with front-flush diaphragm

Measured variable

Span (continuously adjustable) or measuring range, max. operating pressure and max. test pressure

Absolute pressure, front-flush

HART	PROFIBUS PA/ FOUNDATION Fieldbus		
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 ₂ O a	1300 mbar a 130 kPa a 525 inH ₂ O 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 span may differ from these values

Lower measuring limit

Upper measuring limit

0 mbar a/0 kPa a/0 psi a

100 % of max. span

Output

Output signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

Load

- Without HART
- With HART

Physical bus

Protection against polarity reversal

Electrical damping (step width 0.1 s)

HART	PROFIBUS PA/FOUNDATION Fieldbus
4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
3.55 mA, factory preset to 3.84 mA	-
23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-
$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V	-
$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)	-
-	IEC 61158-2
Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.	
Set to 2 s (0 ... 100 s)	

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

Reference conditions
(All error data refer always refer to the set span)

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

Gauge pressure, front-flush**Absolute pressure, front-flush**

- $r \leq 5$

$\leq 0.075 \%$

-

- $5 < r \leq 100$

$\leq (0.005 \cdot r + 0.05) \%$

-

- $r \leq 10$

-

$\leq 0.2 \%$

- $10 < r \leq 30$

-

$\leq 0.4 \%$

Influence of ambient temperature (in percent per 28 °C (50 °F)) $\leq (0.08 \cdot r + 0.16) \%$

$\leq (0.16 \cdot r + 0.24) \%$

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))

$\leq (0.25 \cdot r) \%$ 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

Rated conditionsInstallation 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)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

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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	<ul style="list-style-type: none"> Flanges as per EN and ASME F&B and pharmaceutical flanges
Surface quality touched-by-media	R_a -values $\leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$)/welds $R_a \leq 1.6 \mu\text{m}$ (64 $\mu\text{-inch}$) (Process connections acc. to 3A; R_a -values $\leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$)/welds $R_a \leq 0.8 \mu\text{m}$ (32 $\mu\text{-inch}$))

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 24 V power supply necessary	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Start-up current \leq 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	PTB 13 ATEX 2007 X	
• Intrinsic safety "i"	Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb	
- Marking	-40 ... +85 °C (-40 ... +185 °F) temperature class T4;	
- Permissible ambient temperature	-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: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Explosion-proof "d"	PTB 99 ATEX 1160	
- 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: $U_H = 10.5 \dots 45 \text{ V DC}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$
• Dust explosion protection for zone 20	PTB 01 ATEX 2055	
- 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: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$	FISCO supply unit: $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$ Linear barrier: $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Dust explosion protection for zone 21/22	Ex II 2 D Ex tb IIIC T120°C Db	
- Marking	Ex II 2 D IP65 T 120 °C	
- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$	To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$
• 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)	$U_m = 45 \text{ V}$	$U_m = 32 \text{ V}$
- Connections (Ex ic)	To circuits with values: $U_i = 45 \text{ V}$	FISCO supply unit ic: $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$ Linear barrier: $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$
- Effective internal inductance/capacitance	$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$	$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$
• Explosion 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.

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

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HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
PROFIBUS PA communication		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- 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		

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		
• Housing made of die-cast aluminium		0
• Housing 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⁾		NC
Electrical connection/cable entry		
• Inner thread M20 x 1.5		B
• Female thread ½-14 NPT		C
• Device plug Han 7D (plastic housing) 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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

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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)		7 M F 4 1 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 M F 4 1 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		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		
• Housing made of die-cast aluminium		0
• Housing 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)		7 M F 4 1 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 M F 4 1 3 5 -
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		

Selection and Ordering data		Order code			
Further designs Add "-Z" to Article No. and specify Order code.			HART	PA	FF
Device plugs¹⁾					
• 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 ₂ O and/or psi		B21	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2		C11	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1		C12	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2		C14	✓	✓	✓
Functional safety (SIL2) 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			
Further designs Add "-Z" to Article No. and specify Order code.			HART	PA	FF
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 casing 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 connection⁷⁾ Sealing is included in delivery					
• TG 52/50, PN 40		R10	✓	✓	✓
• TG 52/150, PN 40		R11	✓	✓	✓

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

1

Selection and Ordering data		Order code			
Further designs Add "-Z" to Article No. and specify Order code.			HART	PA	FF
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 housing DN 40 ... 125 and 1½" ... 6", PN 40	N28	✓	✓	✓	
Temperature decoupler up to 200 °C⁸⁾ 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			
Further designs Add "-Z" to Article No. and specify Order code.			HART	PA	FF
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).

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, 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 ₂ O ¹⁾ , inH ₂ O ¹⁾ , ftH ₂ O ¹⁾ , mmHG, inHG, psi, Pa, kPa, MPa, g/cm ² , kg/cm ² , Torr, ATM or % ¹⁾ ref. temperature 20 °C	Y21	✓	✓	✓
Setting of pressure indication in non-pressure units²⁾ 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.

Pressure Measurement

Pressure transmitters

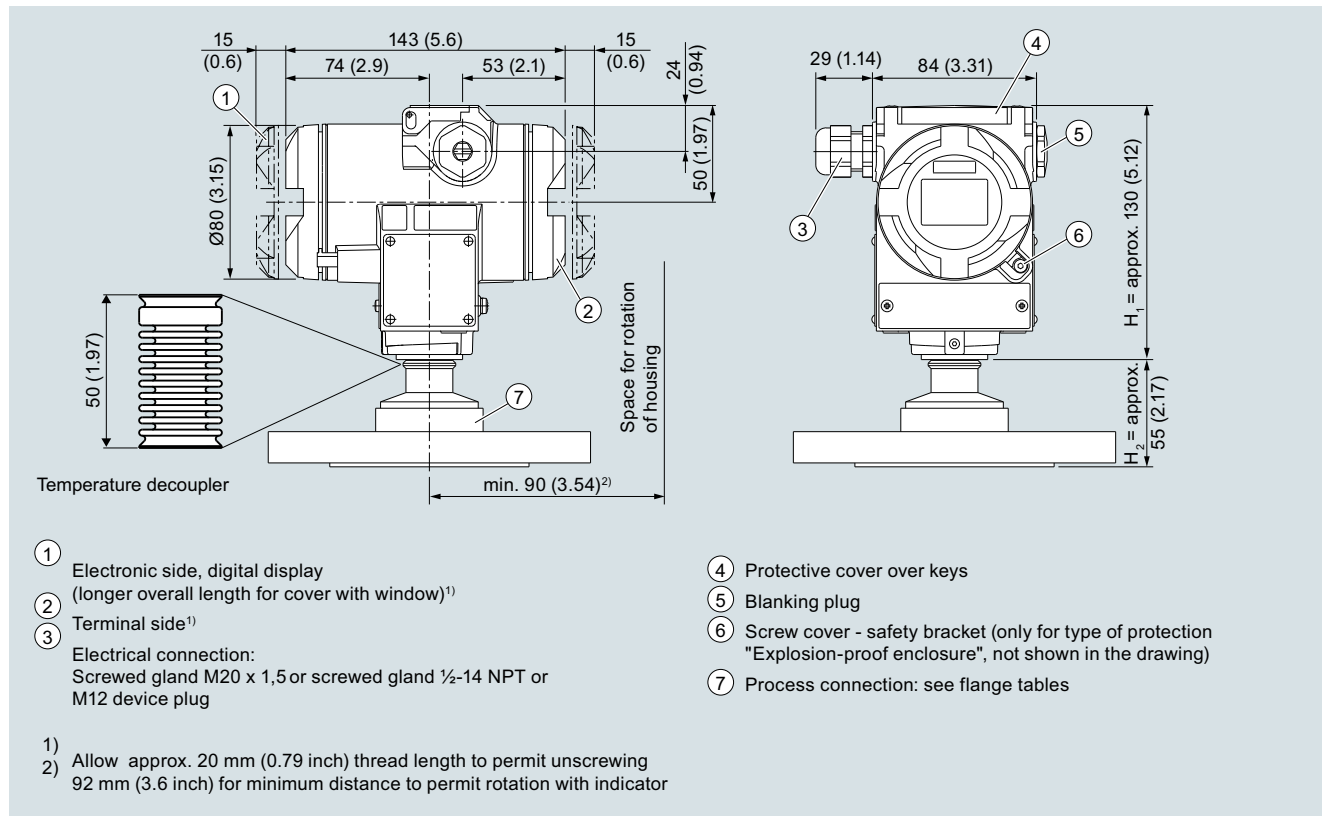
for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

1

Dimensional drawings



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

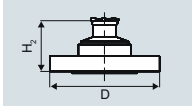
The diagram shows a SITRANS P DS III with an example of a flange. In this drawing the height is subdivided into H_1 and H_2 .

H_1 = Height of the SITRANS P300 up to a defined cross-section

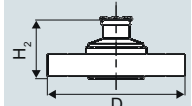
H_2 = Height of the flange up to this defined cross-section

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

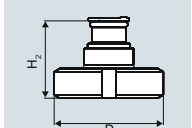
Flanges according to EN and ASME**Flange according to EN****EN 1092-1**

	Order code	DN	PN	ØD	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")	

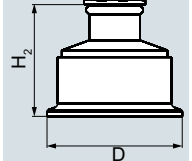
Flanges according to ASME**ASME B16.5**

	Order code	DN	PN	ØD	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")	

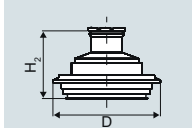
NuG and pharmaceutical connections**Connections to DIN****DIN 11851 (milk pipe union with slotted union nut)**

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

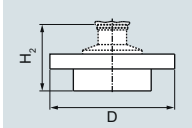
Tri-Clamp nach DIN 32676

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

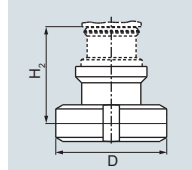
Other connections**Varivent connection**

	Order code	DN	PN	ØD	H ₂
	N28	40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

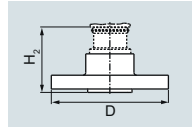
Sanitary process connection to DRD

	Order code	DN	PN	ØD	H ₂
	M32	50	40	105 mm (4.1")	Approx. 52 mm (2")

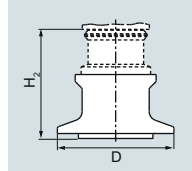
Sanitary process screw connection to NEUMO Bio-Connect

	Order code	DN	PN	ØD	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")	

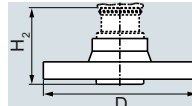
Sanitary process connection to NEUMO Bio-Connect flange connection

	Order code	DN	PN	ØD	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")	

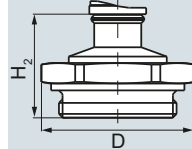
Sanitary process connection to NEUMO Bio-Connect clamp connection

	Order code	DN	PN	ØD	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	ØD	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	ØD	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")

Pressure Measurement

Pressure transmitters

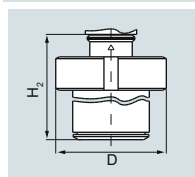
for applications with advanced requirements (Advanced)

SITRANS P DS III

for gauge/absolute pressure, with front-flush diaphragm

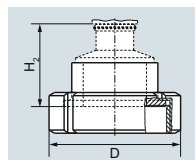
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Tank connection TG 52/50 and TG52/150



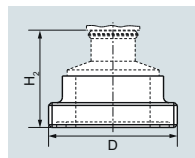
Order code	DN	PN	ØD	H ₂
R10	25	40	63 mm (2.5")	Approx. 63 mm (2.5")
R11	25	40	63 mm (2.5")	Approx. 170 mm (6.7")

SMS socket with union nut



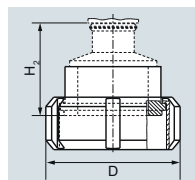
Order code	DN	PN	ØD	H ₂
M67	2"	25	84 mm (3.3")	Approx. 52 mm (2")
M68	2½"	25	100 mm (3.9")	
M69	3"	25	114 mm (4.5")	

SMS threaded socket



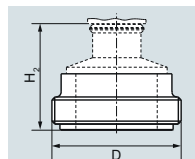
Order code	DN	PN	ØD	H ₂
M73	2"	25	70 x 1/6 mm	Approx. 52 mm (2")
M74	2½"	25	85 x 1/6 mm	
M75	3"	25	98 x 1/6 mm	

IDF socket with union nut



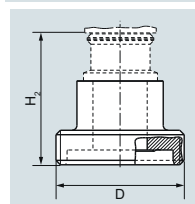
Order code	DN	PN	ØD	H ₂
M82	2"	25	77 mm (3")	Approx. 52 mm (2")
M83	2½"	25	91 mm (3.6")	
M84	3"	25	106 mm (4.2")	

IDF threaded socket



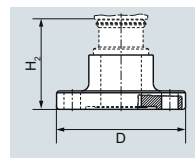
Order code	DN	PN	ØD	H ₂
M92	2"	25	64 mm (2.5")	Approx. 52 mm (2")
M93	2½"	25	77.5 mm (3.1")	
M94	3"	25	91 mm (3.6")	

Aseptic threaded socket to DIN 11864-1 Form A



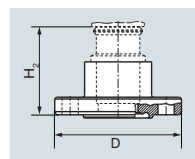
Order code	DN	PN	ØD	H ₂
N33	50	25	78 x 1/6"	Approx. 52 mm (2")
N34	65	25	95 x 1/6"	
N35	80	25	110 x 1/4"	
N36	100	25	130 x 1/4"	

Aseptic flange with notch to DIN 11864-2 Form A



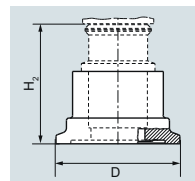
Order code	DN	PN	ØD	H ₂
N43	50	16	94	Approx. 52 mm (2")
N44	65	16	113	
N45	80	16	133	
N46	100	16	159	

Aseptic flange with groove to DIN 11864-2 Form A



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

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P DS III

for absolute pressure (from gauge pressure series)

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Technical specifications

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

Input

Measured variable

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

Absolute pressure

HART

PROFIBUS PA/ FOUNDATION Fieldbus

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 inH₂O a
43.34 ... 1300 mbar a
4.33 ... 130 kPa a
17.42 ... 522.4 inH₂O a

250 mbar a
25 kPa a
100 inH₂O a
1300 mbar a
130 kPa a
525 inH₂O a

1.5 bar a
150 kPa a
21.8 psi a
2.6 bar a
260 kPa a
37.7 psi a

6 bar a
600 kPa a
87 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
- Measuring cell with inert filling liquid
- for process temperature -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)

0 mbar a/0 kPa a/0 psi a

- for process temperature 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. span
(for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/process temperature)

Start of scale value

Between the measuring limits (fully adjustable)

Output

Output signal

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

Load

- Without HART
- With HART

$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω ,
 U_H : Power supply in V

$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or
 $R_B = 230 \dots 1100 \Omega$ (HART Communicator)

-

-

Physical bus

-

IEC 61158-2

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)

Pressure Measurement

Pressure transmitters

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

Measuring accuracy

Reference conditions

(All error data refer always refer to the set span)

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- $r \leq 10$

$\leq 0.1 \%$

- $10 < r \leq 30$

$\leq 0.2 \%$

Influence of ambient temperature (in percent per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a

$\leq (0.15 \cdot r + 0.1) \%$

- 1300 mbar a/130 kPa a/18.8 psi a

$\leq (0.08 \cdot r + 0.16) \%$

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

Long-term stability (temperature change ± 30 °C (± 54 °F))

$\leq (0.25 \cdot r) \%$ 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

Rated conditions

Degree of protection

- according to EN 60529

IP66 (optional IP66/IP68)

- according to NEMA 250

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F) with 30 bar 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 24 V power supply necessary	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

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

Certificates and approvals

Classification according to PED 2014/68/EU

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

- Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

- Dust explosion protection for zone 20

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

- Dust explosion protection for zone 21/22

- Marking
- Connection

- Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

- Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

- Explosion protection to CSA

- Identification (XP/DIP) or (IS)

HART

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-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

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIC T120°C Da

Ex II 1/2 D Ex ta/tb IIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIC T120°C Db

To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

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

$U_m = 45 \text{ V}$

To circuits with values:
 $U_i = 45 \text{ V}$

$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

Certificate of Compliance 3008490

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

Certificate of Compliance 1153651

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

PROFIBUS PA/ FOUNDATION Fieldbus

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$
Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$;
 $P_{\max} = 1 \text{ W}$

$U_m = 32 \text{ V}$

FISCO supply unit ic:
 $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$
Linear barrier:
 $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$

$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
PROFIBUS PA communication		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	Standard FOUNDATION Fieldbus function block
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	1 resource block
Internal preprocessing		• Physical block	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 to 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- 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		

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from gauge pressure series)

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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 1/2-14 NPT" (recommended version) ^{3) 4) 5) 6) 7)}		Y 1
Version for diaphragm seals in conjunction with process connector "G1/2B connection shank" ^{3) 4) 5) 6) 7)}		Y 0
Process connection		
• Connection shank G1/2B to EN 837-1		0
• Female thread 1/2-14 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 1/2-14 NPT		6
Non-wetted parts materials		
• Housing made of die-cast aluminium		0
• Housing 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⁾		NC

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 1/2-14 NPT		C
• Device plug Han 7D (plastic housing) 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. span 200 mbar a (80 inH ₂ O a).		
4) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here. If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
5) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
6) The diaphragm seal is to be specified with a separate order number and must be included with 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 approval A, B or E.		
15) Only in connection with Ex approval A, B, E or F.		
16) M12 delivered without cable socket		

Pressure Measurement

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Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
Pressure transmitters for absolute pressure from gauge pressure series			Pressure transmitters for absolute pressure from gauge pressure series		
SITRANS P DS III with PROFIBUS PA (PA)		7 MF 4 2 3 4 -	SITRANS P DS III with PROFIBUS PA (PA)		7 MF 4 2 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 MF 4 2 3 5 -	SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 MF 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		Explosion protection		
Silicone oil	normal	1	• None		A
Inert liquid ¹⁾	grease-free to cleanliness level 2	3	• 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" or "Y22" required)		7
Nominal measuring range			A quick-start guide is included in the scope of delivery of the device.		
250 mbar a	(3.63 psi a)	D	1) For oxygen application, add Order code E10.		
1300 mbar a	(18.86 psi a)	F	2) Available soon		
5 bar a	(72.5 psi a)	G	3) Version 7MF4233-1DY... only up to max. span 200 mbar a (2.9 psi a).		
30 bar a	(435 psi a)	H	4) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.		
160 bar a ²⁾	(2 321 psi a)	L	5) If the acceptance test certificate 3.1.is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
400 bar a ²⁾	(5 802 psi a)	M	6) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF423-...Y... and 7MF4900-1...-B		
700 bar a ²⁾	(10 153 psi a)	N	7) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.		
Wetted parts materials			8) Without cable gland, with blanking plug.		
Seal diaphragm	Process connection		9) With enclosed cable gland Ex ia and blanking plug.		
Stainless steel	Stainless steel	A	10) Configurations with device plugs Han and M12 are only available in Ex ic.		
Hastelloy	Stainless steel	B	11) Only in connection with IP66.		
Hastelloy	Hastelloy	C	12) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.		
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT" (recommended version) ^{3) 4) 5) 6) 7)}		Y 1	13) Only in connection with Ex approval A, B, E or F.		
Version for diaphragm seals in conjunction with process connector "G½B connection shank" ^{3) 4) 5) 6) 7)}		Y 0	14) M12 delivered without cable socket.		
Process connection					
• Connection shank G½B to EN 837-1		0			
• Female thread ½-14 NPT		1			
• Stainless steel oval flange with process connection (Oval flange has no female thread)					
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		2			
- Mounting thread M10 to DIN 19213		3			
- Mounting thread M12 to DIN 19213		4			
• Male thread M20 x 1.5		5			
• Male thread ½ -14 NPT		6			
Non-wetted parts materials					
• Housing made of die-cast aluminium		0			
• Housing stainless steel precision casting		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.					

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from gauge pressure series)

1

Selection and Ordering data	Order code			
Further designs		HART	PA	FF
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 plugs¹⁾				
• 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	B21	✓	✓	✓
Pressure units in inH ₂ O and/or psi				
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2²⁾	C11	✓	✓	✓
Inspection certificate³⁾	C12	✓	✓	✓
Acc. to EN 10204-3.1				
Factory certificate	C14	✓	✓	✓
Acc. to EN 10204-2.2				
Acceptance certificate (EN 10204-3.1)	C15	✓	✓	✓
PMI test of parts in contact with medium				
Functional safety (SIL2)	C20	✓		
Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration				
Functional safety (PROFIsafe) Certificate and PROFIsafe protocol	C21 ⁴⁾		✓	
Functional safety (SIL2/3)	C23	✓		
Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration				
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/2D⁵⁾ (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			
Further designs		HART	PA	FF
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 casing 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 the manufacturer's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.

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

4) 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		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 ₂ O ^{*)} , inH ₂ O ^{*)} , ftH ₂ O ^{*)} , 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 units³⁾ 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.

Technical specifications

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

Input

Measured variable

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

Absolute pressure

HART

PROFIBUS PA/
FOUNDATION
Fieldbus

Span

Nominal measuring range

Max. operating pressure MAWP (PS)

8.34 ... 250 mbar a
0.834 ... 25 kPa a
3 ... 100 inH₂O a

250 mbar a
25 kPa a
100 inH₂O a

32 bar a
3.2 MPa a
464 psi a

43.34 ... 1300 mbar a
4.33 ... 130 kPa a
17 ... 525 inH₂O a

1300 mbar a
130 kPa a
525 inH₂O 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
- Measuring cell with inert filling liquid

0 mbar a/0 kPa a/0 psi a

- for process temperature $-20\text{ °C} < \vartheta \leq +60\text{ °C}$
($-4\text{ °F} < \vartheta \leq +140\text{ °F}$)

30 mbar a/3 kPa a/0.44 psi a

- for process temperature
 $60\text{ °C} < \vartheta \leq +100\text{ °C}$ (max. 85 °C for measuring cell 30 bar)
($140\text{ °F} < \vartheta \leq +212\text{ °F}$ (max. 185 °F for measuring cell 435 psi))

$30\text{ mbar a} + 20\text{ mbar a} \cdot (\vartheta - 60\text{ °C})/\text{°C}$
 $3\text{ kPa a} + 2\text{ kPa a} \cdot (\vartheta - 60\text{ °C})/\text{°C}$
 $0.44\text{ psi a} + 0.29\text{ psi a} \cdot (\vartheta - 140\text{ °F})/\text{°F}$

Upper measuring limit

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

Start of scale value

Between the measuring limits (fully adjustable)

Output

Output signal

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA

-

23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

-

Load

- Without HART

$R_B \leq (U_H - 10.5\text{ V})/0.023\text{ A}$ in Ω ,
 U_H : Power supply in V

-

- With HART

$R_B = 230 \dots 500\ \Omega$ (SIMATIC PDM) or
 $R_B = 230 \dots 1100\ \Omega$ (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)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

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

Measuring accuracy

Reference conditions
(All error data refer always refer to the set span)

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down)

$r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl.
hysteresis and reproducibility

- Linear characteristic

- $r \leq 10$

$\leq 0.1 \%$

- $10 < r \leq 30$

$\leq 0.2 \%$

Influence of ambient temperature
(in percent per 28 °C (50 °F))

- 250 mbar a/25 kPa a/3.6 psi a

$\leq (0.15 \cdot r + 0.1) \%$

- 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

$\leq (0.08 \cdot r + 0.16) \%$

Long-term stability
(temperature change ± 30 °C (± 54 °F))

$\leq (0.25 \cdot r) \%$ in 5 years

Effect of mounting position (in pressure per change in angle)

$\leq 0.7 \text{ mbar}/0.07 \text{ kPa}/0.010 \text{ psi}$ 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

Rated conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
- In conjunction with dust explosion protection

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- 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 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 oxygen measurement pressure 100 bar (1450 psi) at 60 °C (140 °F))
Process connection	1/4-18 NPT and flange connection with mounting thread M10 to DIN 19213 or 7/16-20 UNF to IEC 61518/DIN EN 61518
Material of mounting bracket	
• Steel	Sheet-steel, Mat. No. 1.0330, chrome-plated
• Stainless steel 304	Sheet stainless steel, mat. no. 1.4301 (SS 304)
• Stainless steel 316L	Sheet stainless steel, mat. no. 1.4404 (SS 316L)

Power supply U_H

	HART	PROFIBUS PA/FOUNDATION Fieldbus
Terminal voltage on transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically-safe mode	-
Power supply		Supplied through bus
Separate 24 V power supply necessary	-	No
Bus voltage		
• Not Ex	-	9 ... 32 V
• With intrinsically-safe operation	-	9 ... 24 V
Current consumption		
• Basic current (max.)	-	12.5 mA
• Start-up current ≤ basic current	-	Yes
• Max. current in event of fault	-	15.5 mA
Fault disconnection electronics (FDE) available	-	Yes

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

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

Certificates and approvals

Classification according to PED 2014/68/EU

Explosion protection

• Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

• Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

• Dust explosion protection for zone 20

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

• Dust explosion protection for zone 21/22

- Marking
- Connection

• Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

• Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

• Explosion protection to CSA

- Identification (XP/DIP) or (IS)

HART

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-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

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

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

$U_m = 45 \text{ V}$

To circuits with values:
 $U_i = 45 \text{ V}$

$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

Certificate of Compliance 3008490

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

Certificate of Compliance 1153651

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

PROFIBUS PA/ FOUNDATION Field-bus

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values:
 $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$

$U_m = 32 \text{ V}$

FISCO supply unit ic:
 $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$

Linear barrier:
 $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$

$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x		
Software for computer	SIMATIC PDM		
PROFIBUS PA communication			
Simultaneous communication with master class 2 (max.)	4	• Analog input	Yes, linearly rising or falling characteristic
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Adaptation to customer-specific process variables	0 to 100 s
Cyclic data usage		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
• Output byte	5 (one measured value) or 10 (two measured values)	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Internal preprocessing		- Limit monitoring	Yes
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	- Square-rooted characteristic for flow measurement	
Function blocks	2	• PID	Standard FOUNDATION Fieldbus function block
• Analog input		• Physical block	1 resource block
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
- Electrical damping, adjustable	0 ... 100 s		
- Simulation function	Input /Output	• Pressure transducer block	
- Failure mode	parameterizable (last good value, substitute value, incorrect value)	- Can be calibrated by applying two pressures	Yes
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively	- Monitoring of sensor limits	Yes
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- 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		

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

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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)	KE
Wetted parts materials		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Tantalum	Tantalum	E
Monel	Monel	H
Gold	Gold	L
Version for diaphragm seal ^{2) 3) 4) 5) 6)}		Y
Process connection		
Female thread 1/4-18 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 housing	
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⁾		NC

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 1/2-14 NPT		C
• Device plug Han 7D (plastic housing) 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. span 200 mbar a (2.9 psi a).		
3) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the <u>total</u> combination is certified here.		
4) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
5) The diaphragm seal is to be specified with a separate order number and must be included with 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 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 approval A, B or E.		
15) Only in connection with Ex approval A, B, E or F.		
16) M12 delivered without cable socket.		

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)	KE	
Wetted parts materials			
Seal diaphragm	Parts of measuring cell		
Stainless steel	Stainless steel	A	
Hastelloy	Stainless steel	B	
Hastelloy	Hastelloy	C	
Tantalum	Tantalum	E	
Monel	Monel	H	
Gold	Gold	L	
Version as diaphragm seal 2) 3) 4) 5) 6)		Y	
Process connection			
Female thread 1/4-18 NPT with flange connection			
<ul style="list-style-type: none"> Sealing screw opposite process connection <ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M10 to DIN 19213 (only for replacement requirement) 		2	
<ul style="list-style-type: none"> Vent on side of process flange⁷⁾ <ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M10 to DIN 19213 (only for replacement requirement) 		0	
		6	
		4	
Non-wetted parts materials			
process flange screws	Electronics housing		
Stainless steel	Die-cast aluminum	2	
Stainless steel	Stainless steel precision casting	3	
Version			
<ul style="list-style-type: none"> Standard version, German plate inscription, setting for pressure unit: bar 		1	
<ul style="list-style-type: none"> International version, English plate inscription, setting for pressure unit: bar 		2	
<ul style="list-style-type: none"> 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			
<ul style="list-style-type: none"> None 		A	
<ul style="list-style-type: none"> With ATEX, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety (Ex ia)" "Explosion-proof (Ex d)"⁸⁾ "Intrinsic safety and flameproof enclosure (Ex ia + Ex d)"⁹⁾ "Ex nA/ic (Zone 2)"¹⁰⁾ "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"^{9) 11)} 		B	
		D	
		P	
		E	
		R	
<ul style="list-style-type: none"> FM + CSA intrinsic safe (is)¹²⁾ 		F	
<ul style="list-style-type: none"> FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D^{9) 11) 12)} 		S	
<ul style="list-style-type: none"> With FM + CSA, Type of protection: <ul style="list-style-type: none"> "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
- Screwed gland 1/2-14 NPT
- Device plugs M12 (stainless steel)^{13) 14)}

B
C
F

Display

- Without display
- Without visible display (display concealed, setting: bar)
- With visible display (setting: bar)
- With customer-specific display (setting as specified, Order code "Y21" required)

0
1
6
7

Included in delivery of the device:

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

- For oxygen application, add Order code E10.
- Version 7MF4334-1DY... only up to max. span 200 mbar a (80 inH₂O a).
- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1. is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF433-...Y... and 7MF4900-1...-B
- The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- Not for nominal measuring range 100 bar a (1450 psi a). Position of the top vent valve in the process flange (see dimensional drawing).
- Without cable gland, with blanking plug
- With enclosed cable gland Ex ia and blanking plug
- Configurations with device plugs Han and M12 are only available in Ex ic.
- Only in connection with IP66.
- 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.
- M12 delivered without cable socket

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

1

Selection and Ordering data		Order code			
Further designs Add "-Z" to Article No. and specify Order code.			HART	PA	FF
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	✓	✓	✓	
• FFP (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	✓	
• NBR (Buna N)	A23	✓	✓	✓	
Device plugs¹⁾					
• Han 7D (metal)	A30	✓			
• Han 8D (instead of Han 7D)	A31	✓			
• Angled	A32	✓			
• Han 8D (metal)	A33	✓			
Sealing screw 1/4-18 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 ₂ O and/or psi		B21	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2²⁾		C11	✓	✓	✓
Inspection certificate³⁾ Acc. to EN 10204-3.1		C12	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2		C14	✓	✓	✓
Acceptance certificate (EN 10204-3.1) PMI test of parts in contact with medium		C15	✓	✓	✓
Functional safety (SIL2) 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			
Further designs Add "-Z" to Article No. and specify Order code.			HART	PA	FF
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 1/2-14 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			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
Use in or on zone 1D/2D⁵⁾ (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	✓	✓	✓
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 casing and cover (PU on epoxy)	G10	✓	✓	✓
Interchanging of process connection side	H01	✓	✓	✓
Vent on side for gas measurements	H02	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines (not together with K01, K02 and K04) ⁸⁾	H03	✓	✓	✓

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

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

4) 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.

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for absolute pressure (from differential pressure series)

1

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 ₂ O ^{*)} , inH ₂ O ^{*)} , ftH ₂ O ^{*)} , 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 units³⁾ 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.

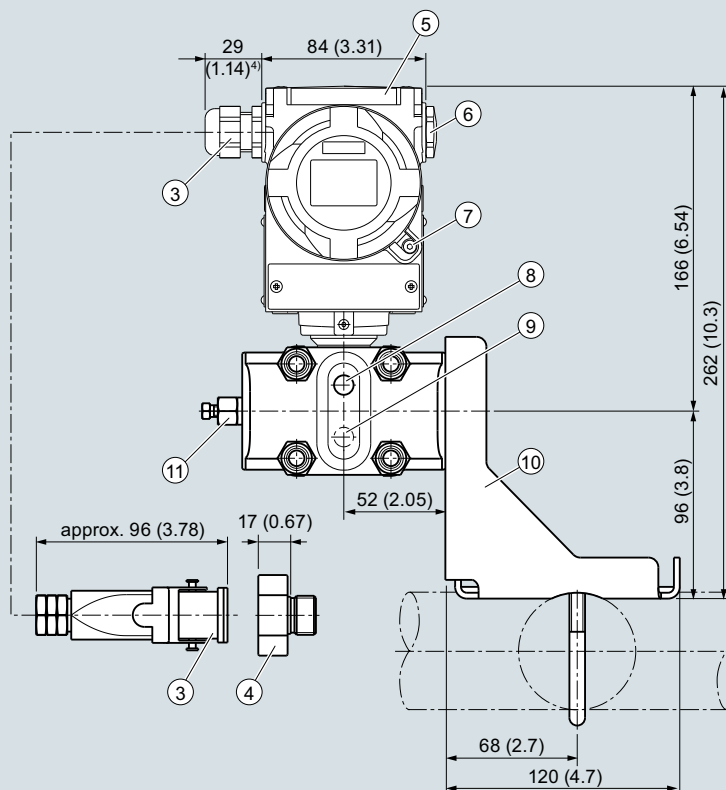
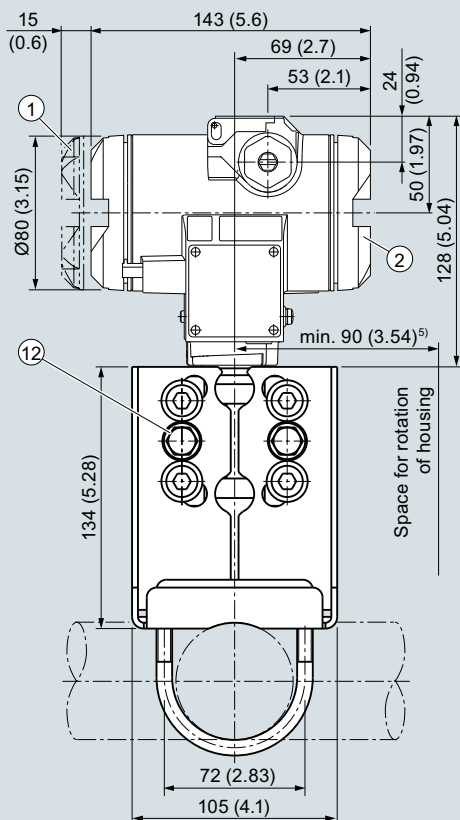
Only Y01, Y15, Y16, Y17, Y21, Y22, Y25 and D05 can be factory preset

✓ = 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 side¹⁾
- 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)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

Technical specifications

SITRANS P, DS III for differential pressure and flow

Input

Measured variable

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

Differential pressure and flow

HART

PROFIBUS PA/ FOUNDATION Fieldbus

Span	Nominal measuring range	Max. operating pressure MAWP (PS)
1 ... 20 mbar 0.1 ... 2 kPa 0.4 ... 8 inH ₂ O	20 mbar 2 kPa 8 inH ₂ O	32 bar 3.2 MPa 464 psi
1 ... 60 mbar 0.1 ... 6 kPa 0.4 ... 24 inH ₂ O	60 mbar 6 kPa 24.1 inH ₂ O	160 bar 16 MPa 2320 psi
2.5 ... 250 mbar 0.2 ... 25 kPa 1 ... 100 inH ₂ O	250 mbar 25 kPa 100 inH ₂ O	
6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH ₂ O	600 mbar 60 kPa 240 inH ₂ O	
16 ... 1600 mbar 1.6 ... 160 kPa 6.4 ... 642 inH ₂ O	1600 mbar 160 kPa 642 inH ₂ O	
50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH ₂ O	5000 mbar 500 kPa 2000 inH ₂ O	
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 ₂ O	250 mbar 25 kPa 100 inH ₂ O	420 bar 42 MPa 6091 psi
6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH ₂ O	600 mbar 60 kPa 240 inH ₂ O	(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 ₂ O	1600 mbar 160 kPa 642 inH ₂ O	
50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH ₂ O	5000 mbar 500 kPa 2000 inH ₂ O	
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
- Measuring cell with inert filling liquid
 - for process temperature $-20\text{ °C} < \vartheta \leq +60\text{ °C}$
($-4\text{ °F} < \vartheta \leq +140\text{ °F}$)
 - for process temperature
 $60\text{ °C} < \vartheta \leq +100\text{ °C}$ (max. 85 °C for measuring cell 30 bar)
($140\text{ °F} < \vartheta \leq +212\text{ °F}$ (max. 185 °F for measuring cell 435 psi))

-100 % of max. span (-33 % with measuring cell 30 bar/3 MPa/435 psi)
or 30 mbar a/3 kPa a/0.44 psi a

-100 % of max. span (-33 % with measuring cell 30 bar/3 MPa/435 psi)
or 30 mbar a/3 kPa a/0.44 psi a

30 mbar a + 20 mbar a · ($\vartheta - 60\text{ °C}$)/°C
3 kPa a + 2 kPa a · ($\vartheta - 60\text{ °C}$)/°C
0.44 psi a + 0.29 psi a · ($\vartheta - 140\text{ °F}$)/°F

Upper measuring limit

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

Start of scale 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	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω U_H : Power supply in V	-
• With HART	$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (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)	<ul style="list-style-type: none"> Increasing characteristic Start-of-scale value 0 bar/kPa/psi Stainless steel seal diaphragm Silicone oil filling Room temperature 25 °C (77 °F) 	
Measuring span ratio r (spread, Turn-Down)	$r = \text{max. measuring span/set measuring span or nom. pressure range}$	
Error in measurement at limit setting incl. hysteresis and reproducibility		
• Linear characteristic		
- 20 mbar/2 kPa/0.29 psi	$r \leq 5 :$ $5 < r \leq 10 :$ $10 < r \leq 20 :$	$\leq 0.075 \%$ $\leq (0.0029 \cdot r + 0.071) \%$ $\leq (0.0045 \cdot r + 0.071) \%$
- 60 mbar/6 kPa/0.87 psi	$r \leq 5 :$ $5 < r \leq 60 :$	$\leq 0.075 \%$ $\leq (0.005 \cdot r + 0.05) \%$
- 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	$r \leq 5 :$ $5 < r \leq 100 :$	$\leq 0.065 \%$ $\leq (0.004 \cdot r + 0.045) \%$
• Square-rooted characteristic (flow > 50 %)		
- 20 mbar/2 kPa/0.29 psi	$r \leq 5 :$ $5 < r \leq 10 :$ $10 < r \leq 20 :$	$\leq 0.075 \%$ $\leq (0.0029 \cdot r + 0.071) \%$ $\leq (0.0045 \cdot r + 0.071) \%$
- 60 mbar/6 kPa/0.87 psi	$r \leq 5 :$ $5 < r \leq 60 :$	$\leq 0.075 \%$ $\leq (0.005 \cdot r + 0.05) \%$
- 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	$r \leq 5 :$ $5 < r \leq 100 :$	$\leq 0.065 \%$ $\leq (0.004 \cdot r + 0.045) \%$
• Square-rooted characteristic (flow > 25 ... 50 %)		
- 20 mbar/2 kPa/0.29 psi	$r \leq 5 :$ $5 < r \leq 10 :$ $10 < r \leq 20 :$	$\leq 0.15 \%$ $\leq (0.0058 \cdot r + 0.142) \%$ $\leq (0.009 \cdot r + 0.142) \%$
- 60 mbar/6 kPa/0.87 psi	$r \leq 5 :$ $5 < r \leq 60 :$	$\leq 0.015 \%$ $\leq (0.01 \cdot r + 0.1) \%$
- 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	$r \leq 5 :$ $5 < r \leq 100 :$	$\leq 0.13 \%$ $\leq (0.008 \cdot r + 0.09) \%$

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

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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 $\leq (0.15 \cdot r + 0.1) \%$
- 60 mbar/6 kPa/0.87 psi $\leq (0.075 \cdot r + 0.1) \%$
- 250 mbar/25 kPa/3.63 psi $\leq (0.025 \cdot r + 0.125) \%$
- 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

Influence of static pressure

- on the zero point
 - 20 mbar/2 kPa/0.29 psi $\leq (0.15 \cdot r) \%$ per 32 bar
(zero offset is possible with position error adjustment)
 - 60 mbar/6 kPa/0.87 psi $\leq (0.1 \cdot r) \%$ per 70 bar
(zero offset is possible with position error adjustment)
 - 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 $\leq (0.2 \cdot r) \%$ per 70 bar
(zero offset is possible with position error adjustment)
 - 30 bar/3 MPa/435 psi
- on the span
 - 20 mbar/2 kPa/0.29 psi $\leq 0.2 \%$ per 32 bar
 - 60 mbar/6 kPa/0.87 psi $\leq 0.14 \%$ per 70 bar
 - 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

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 $\leq (0.2 \cdot r) \%$ per year
- 60 mbar/6 kPa/0.87 psi $\leq (0.25 \cdot r) \%$ in 5 years
- 30 bar/3 MPa/435 psi
- 250 mbar/25 kPa/3.63 psi $\leq (0.125 \cdot r) \%$ in 5 years
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi

Effect of mounting position (in pressure per change in angle)

≤ 0.7 mbar/0.07 kPa/0.028 inH₂O 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**Rated conditions**

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

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
- Measuring cell with Neobee fill fluid (FDA-compliant)
- In conjunction with dust explosion protection

-20 ... +100 °C (-4 ... +212 °F)

-10 ... +100 °C (+14 ... +212 °F)

-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-AISI12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

- Seal diaphragm

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold

- Process flanges and sealing screw

Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602 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 1/4-18 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
- Stainless steel 304
- Stainless steel 316L

Sheet-steel, Mat. No. 1.0330, chrome-plated

Sheet stainless steel, mat. no. 1.4301 (SS 304)

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

Power supply U_H

Terminal voltage on transmitter

10.5 ... 45 V DC

10.5 ... 30 V DC in intrinsically-safe mode

PROFIBUS PA/ FOUNDATION Fieldbus

-

Power supply

-

Supplied through bus

Separate 24 V power supply necessary

-

No

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

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Certificates and approvals

Classification according to PED 2014/68/EU

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

- Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

- Dust explosion protection for zone 20

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

- Dust explosion protection for zone 21/22

- Marking
- Connection

- Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

- Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

- Explosion protection to CSA

- Identification (XP/DIP) or (IS)

HART

- 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.

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-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

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$;
 $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;
-40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$

$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

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

$U_m = 45 \text{ V}$

To circuits with values:
 $U_i = 45 \text{ V}$

$L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

Certificate of Compliance 3008490

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

Certificate of Compliance 1153651

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

PROFIBUS PA/ FOUNDATION Fieldbus

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values:
 $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1 \text{ W}$

$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$;
 $P_{\max} = 1 \text{ W}$

$U_m = 32 \text{ V}$

FISCO supply unit ic:
 $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$

Linear barrier:
 $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$

$L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x		
Software for PC	SIMATIC PDM		
PROFIBUS PA communication			
Simultaneous communication with master class 2 (max.)	4	• Analog input	Yes, linearly rising or falling characteristic
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Adaptation to customer-specific process variables	0 ... 100 s
Cyclic data usage		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
• Output byte	5 (one measured value) or 10 (two measured values)	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Internal preprocessing		- Limit monitoring	Yes
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	- Square-rooted characteristic for flow measurement	
Function blocks	2	• PID	Standard FOUNDATION Fieldbus function block
• Analog input		• Physical block	1 resource block
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
- Electrical damping, adjustable	0 ... 100 s		
- Simulation function	Input /Output	• Pressure transducer block	
- Failure mode	parameterizable (last good value, substitute value, incorrect value)	- Can be calibrated by applying two pressures	Yes
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively	- Monitoring of sensor limits	Yes
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- 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		

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

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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 ₂ O)	B
PN 160 (MAWP 2320 psi)		
1 ... 60 mbar	(0.4 ... 24 inH ₂ O)	C
2.5 ... 250 mbar	(1.004 ... 100.4 inH ₂ O)	D
6 ... 600 mbar	(2.4 ... 240 inH ₂ O)	E
16 ... 1600 mbar	(6.4 ... 642 inH ₂ O)	F
50 ... 5000 mbar	(20 ... 2000 inH ₂ O)	G
0.3 ... 30 bar	(4.35 ... 435 psi)	H
Wetted parts materials		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Hastelloy	Hastelloy	C
Tantalum ⁴⁾	Tantalum	E
Monel ⁴⁾	Monel	H
Gold ⁴⁾	Gold	L
Version for diaphragm seal ^{5) 6) 7) 8)}		Y
Process connection		
Female thread 1/4-18 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 housing	
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⁾		NC
Electrical connection/cable entry		
• Screwed gland M20 x 1.5		B
• Screwed gland 1/2-14 NPT		C
• Device plug Han 7D (plastic housing) 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. span 20 and 60 mbar (8.03 and 24.09 inH ₂ O))		
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 <u>total</u> combination is certified here.		
6) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.		
7) The diaphragm seal is to be specified with a separate order number and must be included with 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 approval 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.		

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Selection and Ordering data		Article No.	Selection and Ordering data		Article No.
Pressure transmitters for differential pressure and flow PN 32/160 (MAWP 464/2320 psi)			Pressure transmitters for differential pressure and flow PN 32/160 (MAWP 464/2320 psi)		
SITRANS P DS III with PROFIBUS PA (PA)		7 MF 4 4 3 4 -	SITRANS P DS III with PROFIBUS PA (PA)		7 MF 4 4 3 4 -
SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 MF 4 4 3 5 -	SITRANS P DS III with FOUNDATION Fieldbus (FF)		7 MF 4 4 3 5 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.					
Measuring cell filling	Measuring cell cleaning		Explosion protection		
Silicone oil	normal	1	• None		A
Inert liquid ¹⁾	grease-free to cleanliness level 2	3	• With ATEX, Type of protection:		
FDA compliant fill fluid ²⁾			- "Intrinsic safety (Ex ia)"		B
• Neobee oil	normal	4	- "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
Nominal measuring range			• FM + CSA intrinsic safe (is) ¹³⁾		F
PN 32 (MAWP 464 psi)			• FM + CSA (is + ep) + Ex ia + Ex d (ATEX)+ Zone 1D/2D ¹⁰⁾¹²⁾¹³⁾		S
20 mbar ³⁾	(8.03 inH ₂ O)	B	• With FM + CSA, Type of protection:		
PN 160 (MAWP 2320 psi)			- "Intrinsic Safe and Explosion Proof (is + xp)" ⁹⁾¹³⁾		NC
60 mbar	(24 inH ₂ O)	C			
250 mbar	(100 inH ₂ O)	D	Electrical connection/cable entry		
600 mbar	(240 inH ₂ O)	E	• Screwed gland M20 x 1.5		B
1600 mbar	(642 inH ₂ O)	F	• Screwed gland ½-14 NPT		C
5 bar	(2000 inH ₂ O)	G	• Device plugs M12 (stainless steel) ^{14) 15)}		F
30 bar	(435 psi)	H			
Wetted parts materials			Display		
(stainless steel process flanges)			• Without display		0
Seal diaphragm	Parts of measuring cell		• Without visible display (display concealed, setting: bar)		1
Stainless steel	Stainless steel	A	• With visible display (setting: bar)		6
Hastelloy	Stainless steel	B	• With customer-specific display (setting as specified, Order code "Y21" required)		7
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			Included in delivery of the device:		
Female thread ¼-18 NPT with flange connection			• Quick-start guide		
• Sealing screw opposite process connection			• Sealing plug(s) or sealing screw(s) for the process flanges(s)		
- 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 housing				
Stainless steel	Die-cast aluminum	2			
Stainless steel	Stainless steel precision casting	3			
Version					
• Standard versions		1			
• International version, English label inscriptions, documentation in 5 languages on 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.					

- For oxygen application, add Order code E10.
- Available for measuring ranges 250 mbar ... 5 bar.
- Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).
- Not in conjunction with max. span 20 and 60 mbar (8.03 and 24.09 inH₂O))
- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443-...Y... and 7MF4900-1...-B
- The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- Without cable gland, with blanking plug.
- With enclosed cable gland Ex ia and blanking plug.
- Configurations with device plugs Han and M12 are only available in Ex ic.
- Only in connection with IP66.
- Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- Only in connection with Ex approval A, B, E or F.
- M12 delivered without cable socket

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

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Selection and Ordering data	Order code				Selection and Ordering data	Order code			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF	Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
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:					Setting of the upper saturation limit of the output signal to 22.0 mA	D05	✓		
• Steel	A01	✓	✓	✓	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	✓	✓	✓
• Stainless steel 304	A02	✓	✓	✓	Degree of protection IP66/IP68 (only for M20 x 1.5 and ½-14 NPT)	D12	✓	✓	✓
• Stainless steel 316L	A03	✓	✓	✓	Process flange screws made of Monel (max. nominal pressure PN20)	D34	✓	✓	✓
O-rings for process flanges (instead of FPM (Viton))					Supplied with oval flange set (2 items), PTFE packings and screws in thread of process flanges	D37	✓	✓	✓
• PTFE (Teflon)	A20	✓	✓	✓	Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	D59	✓	✓	✓
• FEP (with silicone core, approved for food)	A21	✓	✓	✓	Use in or on zone 1D/2D⁵⁾ (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia)" and IP66)	E01	✓	✓	✓
• FFFM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	✓	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	✓		
• NBR (Buna N)	A23	✓	✓	✓	Oxygen application (In the case of oxygen measurement and inert liquid max. 100 bar (1450 psi) at 60°C (140 °F))	E10	✓	✓	✓
Device plugs¹⁾					Export approval Korea	E11	✓	✓	✓
• Han 7D (metal)	A30	✓			CRN approval Canada (Canadian Registration Number)	E22 ⁶⁾	✓	✓	✓
• Han 8D (instead of Han 7D)	A31	✓			Dual seal	E24	✓	✓	✓
• Angled	A32	✓			Explosion-proof "Intrinsic safety" (Ex ia) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-B..)	E25 ⁷⁾	✓	✓	✓
• Han 8D (metal)	A33	✓			"Flameproof" explosion protection according to INMETRO (Brazil) (only for transmitter 7MF4...-.....-D..)	E26 ⁷⁾	✓	✓	✓
Sealing screws (2 units)	A40	✓	✓	✓	Explosion-proof "Intrinsic safety" (Ex ia + Ex d) to INMETRO (Brazil) (only for transmitter 7MF4...-.....-P..)	E28 ⁷⁾	✓	✓	
¼-18 NPT, with valve in mat. of process flanges					Ex Approval IEC Ex (Ex ia) (only for transmitter 7MF4...-.....-B..)	E45 ⁷⁾	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))	A50	✓	✓	✓	Ex Approval IEC Ex (Ex d) (only for transmitter 7MF4...-.....-D..)	E46 ⁷⁾	✓	✓	✓
Rating plate inscription (instead of German)					Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)	E55 ⁷⁾	✓	✓	✓
• English	B11	✓	✓	✓	Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)	E56 ⁷⁾	✓	✓	✓
• French	B12	✓	✓	✓	Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)	E57 ⁷⁾	✓	✓	✓
• Spanish	B13	✓	✓	✓	Ex protection „Ex ia“, „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-R..)	E58 ⁷⁾	✓	✓	✓
• Italian	B14	✓	✓	✓	"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 ⁷⁾	✓	✓	✓
• Cyrillic (russian)	B16	✓	✓	✓					
English rating plate Pressure units in inH ₂ O and/or psi	B21	✓	✓	✓					
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2²⁾	C11	✓	✓	✓					
Inspection certificate³⁾ to EN 10204-3.1	C12	✓	✓	✓					
Factory certificate to EN 10204-2.2	C14	✓	✓	✓					
Acceptance certificate (EN 10204-3.1) PMI test of parts in contact with medium	C15	✓	✓	✓					
Functional safety (SIL2) 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	✓	✓	✓					

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Selection and Ordering data		Order code			
Further designs Add "-Z" to Article No. and specify Order code.			HART	PA	FF
Ex-protection Ex ia according to EAC Ex (Russia)		E80	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)		E81	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)		E82	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)		E83	✓	✓	✓
Two coats of lacquer on casing and cover (PU on epoxy)		G10	✓	✓	✓
Interchanging of process connection side		H01	✓	✓	✓
Vent on side for gas measurements		H02	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines (not together with K01, K02 and K04⁸⁾)		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 display⁹⁾)		J08	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display⁹⁾)		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 1/2-14 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	✓	✓	✓

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: • in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi • in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi		Y01	✓	✓ ¹⁾	
		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 ₂ O ⁺ , inH ₂ O ⁺ , ftH ₂ O ⁺ , 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 units²⁾ 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 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")

1) Device plug Han IP65

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

3) If the acceptance test certificate 3.1.1 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.

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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 ₂ O)	D
6 ... 600 mbar	(2.4 ... 240 inH ₂ O)	E
16 ... 1600 mbar	(6.4 ... 642 inH ₂ O)	F
50 ... 5000 mbar	(20 ... 2000 inH ₂ O)	G
0.3 ... 30 bar	(4.35 ... 435 psi)	H
Wetted parts materials		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Gold ²⁾	Gold	L
Version for diaphragm seal 3) 4) 5) 6)		Y
Process connection		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		3
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		1
• Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing)		
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		7
- Mounting thread M12 to DIN 19213 (only for replacement requirement)		5
Non-wetted parts materials		
process flange screws	Electronics housing	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting 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 1/2-14 NPT		C
• Device plug Han 7D (plastic housing) 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)

- For oxygen application, add Order code E10.
- Not in conjunction with max. span 600 mbar (240.9 inH₂O)
- When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF453-...Y...-... and 7MF4900-1...-B
- The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- Not in conjunction with Electrical connection "device plug Han 7D".
- Without cable gland, with blanking plug
- With enclosed cable gland Ex ia and blanking plug
- Configurations with device plugs Han and M12 are only available in Ex ic.
- Only in connection with IP66.
- Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- Only in connection with Ex approval A, B or E.
- Permissible only for crimp-contact of conductor cross-section 1 mm²
- Only in connection with Ex approval A, B, E or F.
- M12 delivered without cable socket.

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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 ₂ O)	D	
600 mbar	(240 inH ₂ O)	E	
1600 mbar	(642 inH ₂ O)	F	
5 bar	(2000 inH ₂ O)	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 1/4-18 NPT with flange connection			
<ul style="list-style-type: none"> Sealing screw opposite process connection <ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M12 to DIN 19213 (only for replacement requirement) Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing). <ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M12 to DIN 19213 (only for replacement requirement) 		3	
		1	
		7	
		5	
Non-wetted parts materials			
Process flange screws	Electronics housing		
Stainless steel	Die-cast aluminum	2	
Stainless steel	Stainless steel precision casting	3	
Version			
<ul style="list-style-type: none"> Standard version, German plate inscription, setting for pressure unit: bar International version, English plate inscription, setting for pressure unit: bar Chinese version, English plate inscription, setting for pressure unit: Pascal All versions include DVD with compact operating instructions in various EU languages.		1	
		2	
		3	
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			
<ul style="list-style-type: none"> None With ATEX, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety (Ex ia)" "Explosion-proof (Ex d)"⁷⁾ "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)⁸⁾ "Ex nA/ic (Zone 2)"⁹⁾ "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"^{8) 10)} FM + CSA intrinsic safe (is)¹¹⁾ FM + CSA (is + ep) + Ex ia + Ex d (ATEX)+ Zone 1D/2D^{9) 10) 11)} With FM + CSA, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety and explosion-proof (is + xp)"^{7) 11)}, max PN 360 		A	
		B	
		D	
		P	
		E	
		R	
		F	
		S	
		NC	
Electrical connection/cable entry			
<ul style="list-style-type: none"> Screwed gland M20 x 1.5 Screwed gland 1/2-14 NPT Device plugs M12 (stainless steel)^{12) 13)} 		B	
		C	
		F	
Display			
<ul style="list-style-type: none"> Without (display hidden) Without visible display (display concealed, setting: bar) With visible display (setting: bar) With customer-specific display (setting as specified, Order code "Y21" required) 		0	
		1	
		6	
		7	
Included in delivery of the device:			
<ul style="list-style-type: none"> 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. span 600 mbar (240.9 inH ₂ O)			
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 <u>total</u> combination is certified here.			
4) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.			
5) The diaphragm seal is to be specified with a separate order number and must be included with 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			

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Selection and Ordering data	Order code			
Further designs		HART	PA	FF
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	✓	✓	✓
• FPM (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	✓
• NBR (Buna N)	A23	✓	✓	✓
Device plugs¹⁾				
• Han 7D (metal)	A30	✓		
• Han 8D (instead of Han 7D)	A31	✓		
• Angled	A32	✓		
• Han 8D (metal)	A33	✓		
Sealing screws (2 units) 1/4-18 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 ₂ O and/or psi	B21	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1	C12	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	C14	✓	✓	✓
Acceptance 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 1/2-14 NPT)	D12	✓	✓	✓
Nom. press. rating PN 500 (MAWP 7250 psi) (Only for measuring cell 600 mbar ... 30 bar (240 inH ₂ O ... 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/2D⁴⁾ (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	✓	✓	✓

Selection and Ordering data	Order code			
Further designs		HART	PA	FF
Add "-Z" to Article No. and specify Order code.				
Two coats of lacquer on casing and cover (PU on epoxy)	G10	✓	✓	✓
Interchanging of process connection side	H01	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines	H03	✓	✓	✓
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	S10	✓	✓	✓
• Germanischer Lloyd (DNV-GL)				
• 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 measuring materials 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			
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)	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 ₂ O ³⁾ , inH ₂ O ³⁾ , ftH ₂ O ³⁾ , 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 units²⁾	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.

Pressure Measurement

Pressure transmitters

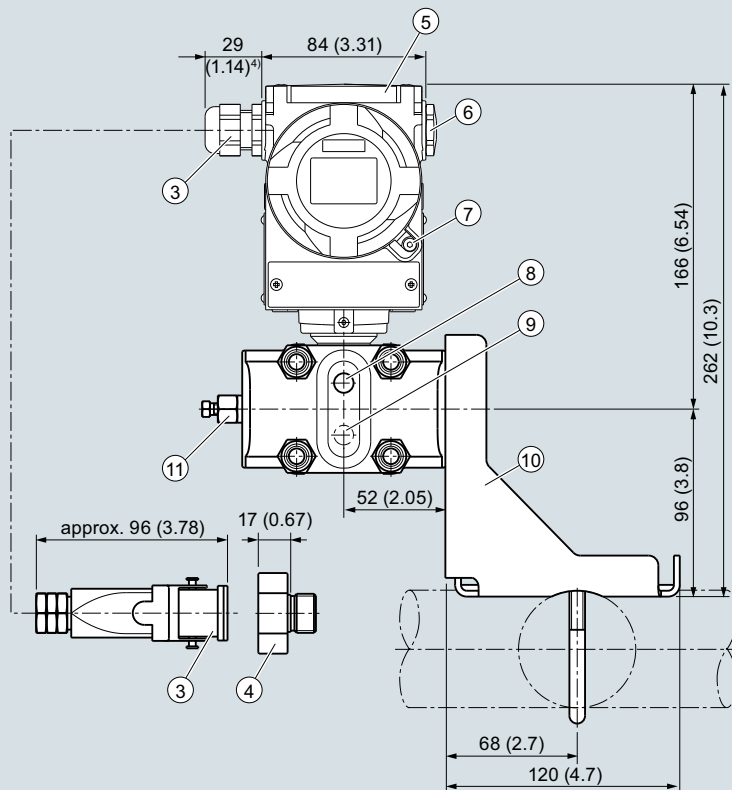
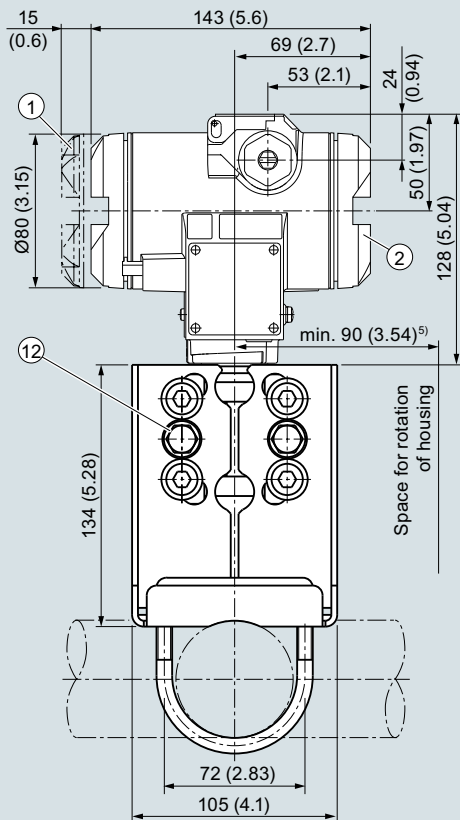
for applications with advanced requirements (Advanced)

SITRANS P DS III

for differential pressure and flow

1

Dimensional drawings

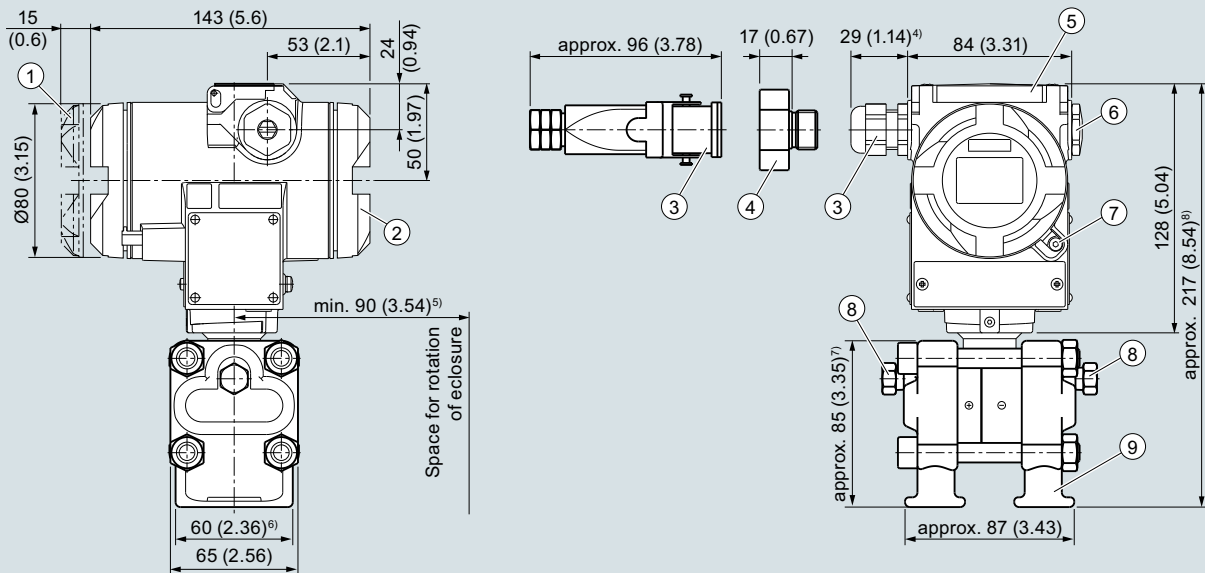


- ① Electronics side, local display (longer overall length for cover with inspection window)¹⁾
- ② Connection side¹⁾
- ③ Electrical connection:
 - Pg 13.5 screw gland (adapter)^{2) 3)}
 - M20 x 1.5 screw gland
 - ½-14 NPT screw gland
 - Han 7D/Han 8D^{2) 3)} device plug
- ④ Harting adapter
- ⑤ Cover 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)



- ① Electronics side, local display (longer overall length for cover with inspection window)¹⁾
- ② Connection side¹⁾
- ③ Electrical connection:
 - Pg 13.5 screw gland (adapter)²⁾
 - M20 x 1,5 screw gland
 - ½-14 NPT screw gland
 - Han 7D/Han 8D²⁾ 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 + XPI]
- 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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

1

Technical specifications

SITRANS P DS III for level

Input

Measured variable

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

Level

HART

PROFIBUS PA/ FOUNDATION Fieldbus

Span

Nominal measuring range

Max. operating pressure MAWP (PS)

25 ... 250 mbar
2.5 ... 25 kPa
10 ... 100 inH₂O

250 mbar
25 kPa
100 inH₂O

See "Mounting flange"

25 ... 600 mbar
2.5 ... 60 kPa
10 ... 240 inH₂O

600 mbar
60 kPa
240 inH₂O

53 ... 1600 mbar
5.3 ... 160 kPa
21 ... 640 inH₂O

1600 mbar
160 kPa
642 inH₂O

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. 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. span or 30 mbar a/3 kPa a/0.44 psi a depending on mounting flange

Upper measuring limit

100 % of max. span

Start of scale value

Between the measuring limits (fully adjustable)

Output

Output signal

HART

PROFIBUS PA/FOUNDATION Fieldbus

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

$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$
 U_H : Power supply in V

-

- With HART

$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or
 $R_B = 230 \dots 1100 \Omega$ (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 level**Measuring accuracy**

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

 $r \leq 5 : \leq 0.125 \%$
 $5 < r \leq 10 : \leq (0.007 \cdot r + 0.09) \%$

- 600 mbar/60 kPa/8.7 psi

 $r \leq 5 : \leq 0.125 \%$
 $5 < r \leq 25 : \leq (0.007 \cdot r + 0.09) \%$

 - 1600 mbar/160 kPa/23.21 psi
 5 bar/500 kPa/72.5 psi

 $r \leq 5 : \leq 0.125 \%$
 $5 < r \leq 30 : \leq (0.007 \cdot r + 0.09) \%$

Influence of ambient temperature (in percent per 28 °C (50 °F))

- 250 mbar/25 kPa/3.6 psi

 $\leq (0.4 \cdot r + 0.16) \%$

- 600 mbar/60 kPa/8.7 psi

 $\leq (0.24 \cdot r + 0.16) \%$

- 1600 mbar/160 kPa/23.21 psi
5 bar/500 kPa/72.5 psi

 $\leq (0.2 \cdot r + 0.16) \%$

Influence of static pressure

- on the zero point

- 250 mbar/25 kPa/3.6 psi

 $\leq (0.3 \cdot r) \%$ per nominal pressure

- 600 mbar/60 kPa/8.7 psi

 $\leq (0.15 \cdot r) \%$ per nominal pressure
 - 1600 mbar/160 kPa/23.21 psi
 5 bar/500 kPa/72.5 psi
 $\leq (0.1 \cdot r) \%$ per nominal pressure

- on the span

 $\leq (0.1 \cdot r) \%$ per nominal pressureLong-term stability (temperature change ± 30 °C (± 54 °F))
 $\leq (0.25 \cdot r) \%$ 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**Rated conditions**

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

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

- High-pressure side

 $-40 \dots +100^{(1)} \text{ °C } (-40 \dots +212^{(1)} \text{ °F})$ $p_{\text{abs}} \geq 1 \text{ bar: } -40 \dots +175 \text{ °C } (-40 \dots +347 \text{ °F})$ $p_{\text{abs}} < 1 \text{ bar: } -40 \dots +80 \text{ °C } (-40 \dots +176 \text{ °F})$

- Low-pressure side

 $-40 \dots +100 \text{ °C } (-40 \dots +212 \text{ °F})$ $-20 \dots +60 \text{ °C } (-4 \dots +140 \text{ °F})$ in conjunction with dust explosion protection

Ambient conditions

- Ambient temperature
 - Transmitter
 - Display readable
- Storage temperature
- Climatic class
 - Condensation

 $-40 \dots +85 \text{ °C } (-40 \dots +185 \text{ °F})$ $-30 \dots +85 \text{ °C } (-22 \dots +185 \text{ °F})$ $-50 \dots +85 \text{ °C } (-58 \dots +185 \text{ °F})$

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

1

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 1/4-18 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

Terminal voltage on transmitter

10.5 ... 45 V DC
10.5 ... 30 V DC in intrinsically-safe mode

PROFIBUS PA/FOUNDATION Fieldbus

-

Power supply

Supplied through bus

Separate 24 V power supply necessary

-

No

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

SITRANS P DS III for level**Certificates and approvals**

Classification according to PED 2014/68/EU

Explosion protection

• Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

• Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

• Dust explosion protection for zone 20

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

• Dust explosion protection for zone 21/22

- Marking
- Connection

• Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

• Explosion protection acc. to FM

- Identification (XP/DIP) or (IS); (NI)

• Explosion protection to CSA

- Identification (XP/DIP) or (IS)

HART

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-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

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$

PTB 13 ATEX 2007 X

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

 $U_m = 45 \text{ V}$

To circuits with values:
 $U_i = 45 \text{ V}$

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$

Certificate of Compliance 3008490

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

Certificate of Compliance 1153651

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

PROFIBUS PA/ FOUNDATION Fieldbus

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values:
 $U_H = 9 \dots 32 \text{ V DC}$

FISCO supply unit:
 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$
 Linear barrier:
 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1.2 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$

 $U_m = 32 \text{ V}$

FISCO supply unit ic:
 $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$

Linear barrier:
 $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$

 $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

1) This value may be increased if the process connection is sufficiently insulated.

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P DS III

for level

1

HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x	• Analog input	Yes, linearly rising or falling characteristic
Software for computer	SIMATIC PDM	- Adaptation to customer-specific process variables	0 ... 100 s
PROFIBUS PA communication		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
Simultaneous communication with master class 2 (max.)	4	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Cyclic data usage		- Limit monitoring	Yes
• Output byte	5 (one measured value) or 10 (two measured values)	- Square-rooted characteristic for flow measurement	
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	• PID	Standard FOUNDATION Fieldbus function block
Internal preprocessing		• Physical block	1 resource block
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
Function blocks	2	• Pressure transducer block	
• Analog input		- Can be calibrated by applying two pressures	Yes
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	- Monitoring of sensor limits	Yes
- Electrical damping, adjustable	0 ... 100 s	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- 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	Mounting flange	
- Failure mode	parameterizable (summation with last good value, continuous summation, summation with incorrect value)	Nominal diameter	Nominal pressure
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively	• Acc. to EN 1092-1	
		- DN 80	PN 40
• Physical block	1	- DN100	PN16, PN40
Transducer blocks	2	• To ASME B16.5	
• Pressure transducer block		- 3 inch	class 150, class 300
- Can be calibrated by applying two pressures	Yes	- 4 inch	class 150, class 300
- 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		

Selection and Ordering data		Article No.
Pressure transmitter for level, SITRANS P DS III with HART		7MF4633 -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		Y -
Measuring cell filling	Measuring cell cleaning	
Silicone oil	normal	1
Measuring span (min. ... max.)		
25 ... 250 mbar	(10 ... 100 inH ₂ O)	D
25 ... 600 mbar	(10 ... 240 inH ₂ O)	E
53 ... 1600 mbar	(21 ... 642 inH ₂ O)	F
0.16 ... 5 bar	(64.3 ... 2000 inH ₂ O)	G
Process connection of low-pressure side		
Female thread 1/4-18 NPT with flange connection		
<ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M10 to DIN 19213 (only for replacement requirement) 		2 0
Non-wetted parts materials		
process flange screws	Electronics housing	
Stainless steel	Die-cast aluminum	2
Stainless steel	Stainless steel precision casting ¹⁾	3
Version		
<ul style="list-style-type: none"> Standard version, German plate inscription, setting for pressure unit: bar International version, English plate inscription, setting for pressure unit: bar Chinese version, English plate inscription, setting for pressure unit: Pascal 		1 2 3
All versions include DVD with compact operating instructions in various EU languages.		
Explosion protection		
<ul style="list-style-type: none"> None With ATEX, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety (Ex ia)" "Explosion-proof (Ex d)"²⁾ "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)"³⁾ "Ex nA/ic (Zone 2)"⁴⁾ "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"³⁾⁵⁾ FM + CSA intrinsic safe (is)⁶⁾ FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D³⁾⁵⁾⁶⁾ With FM + CSA, Type of protection: <ul style="list-style-type: none"> "Intrinsic Safe and Explosion Proof (is + xp)"¹⁾⁶⁾ 		A B D P E R F S NC
Electrical connection/cable entry		
<ul style="list-style-type: none"> Screwed gland M20x1.5 Screwed gland 1/2-14 NPT Device plug Han 7D (plastic housing) incl. mating connector⁷⁾ Device plugs M12 (stainless steel)^{8) 9)} 		B C D F
Display		
<ul style="list-style-type: none"> Without display Without visible display (display concealed, setting: mA) With visible display (setting mA) With customer-specific display (setting as specified, Order code "Y21" or "Y22" required) 		0 1 6 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.

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

1

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 ₂ O)	D
600 mbar (240 inH ₂ O)	E
1600 mbar (642 inH ₂ O)	F
5 bar (2000 inH ₂ O)	G
Process connection of low-pressure side	
Female thread 1/4-18 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 housing	
Stainless steel Die-cast aluminum	2
Stainless steel Stainless steel precision casting	3
Version	
• Standard version, German plate inscription, setting for pressure unit: bar)	1
• International version, English plate inscription, setting for pressure unit: bar	2
• Chinese version, English plate inscription, setting for pressure unit: Pascal	3
All versions include DVD with compact operating instructions in various EU languages.	
Explosion protection	
• None	A
• With ATEX, Type of protection:	
- "Intrinsic safety (Ex ia)"	B
- "Explosion-proof (Ex d)" 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⁾	NC
Electrical connection/cable entry	
• Screwed gland M20 x 1.5	B
• Screwed gland 1/2-14 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.

Selection and Ordering data		Order code			
Further designs			HART	PA	FF
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 plugs¹⁾					
• Han 7D (metal)	A30	✓			
• Han 8D (instead of Han 7D)	A31	✓			
• Angled	A32	✓			
• Han 8D (metal)	A33	✓			
Sealing screw					
1/4-18 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 ₂ O and/or psi	B21	✓	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2					
	C11	✓	✓	✓	✓
Inspection certificate					
Acc. to EN 10204-3.1	C12	✓	✓	✓	✓
Factory certificate					
Acc. to EN 10204-2.2	C14	✓	✓	✓	✓
Acceptance 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 1/2-14 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			
Further designs			HART	PA	FF
Add "-Z" to Article No. and specify Order code.					
Use on zone 1D / 2D³⁾ (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 casing and cover (PU on epoxy)		G10	✓	✓	✓
Replacement of process connection side		H01	✓	✓	✓

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level

1

Selection and Ordering data		Order code		
Further designs		HART	PA	FF
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			
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, 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 ₂ O ^{*)} , inH ₂ O ^{*)} , ftH ₂ O ^{*)} , 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 units²⁾ 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	J 0 A
	PN 63/100/160	Z	J 0 B
DN 40	PN 10/16/25/40	Z	J 0 C
	PN 63/100	Z	J 0 D
	PN 160	Z	J 0 E
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	J 6 A
	class 300	Z	J 6 B
	class 400/600	Z	J 6 C
	class 900/1500	Z	J 6 D
1½ inch	class 150	Z	J 6 E
	class 300	Z	J 6 F
	class 400/600	Z	J 6 G
	class 900/1500	Z	J 6 H
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	J 7 A
	20 K 316L	Z	J 7 B
JIS DN 80	10 K 316L	Z	J 7 C
	20 K 316L	Z	J 7 D
Other version, add Order code and plain text: Nominal diameter: ...; Nominal press.: ...		Z	J 1 Y
Wetted parts materials			
<ul style="list-style-type: none"> Stainless steel 316L <ul style="list-style-type: none"> Coated with PFA Coated with PTFE Coated with ECTFE¹⁾ 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 (max. 150 °C (302 °F)) Nickel 201 (max. 260 °C (500 °F)) Duplex 2205, mat. no. 1.4462 Duplex 2205, mat. no. 1.4462, incl. main body Stainless steel 316L, gold plated, thickness approx. 25 µm 		A D E F G J U V K L M Q R S	0
Tube length			
<ul style="list-style-type: none"> without tube 			0
Other version: add Order code and plain text: material of parts in contact with medium:, tubus length:		Z 8	K 1 Y

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			
<ul style="list-style-type: none"> Wetted parts materials: Stainless steel without foil 			
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	
<ul style="list-style-type: none"> Wetted parts materials: Stainless steel coated with ECTFE 			
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	
<ul style="list-style-type: none"> Wetted parts materials: Stainless steel coated with PFA 			
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	
<ul style="list-style-type: none"> Wetted parts materials: 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	
<ul style="list-style-type: none"> Wetted parts materials: 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	
<ul style="list-style-type: none"> Wetted parts materials: 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	
Filling liquid			
<ul style="list-style-type: none"> Silicone oil M5 Silicone oil M50 High-temperature oil Halocarbon oil (for O₂-measurement)²⁾ Food oil (FDA-listed) 			
Other version, add Order code and plain text: filling liquid: ...		9	M 1 Y

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.

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

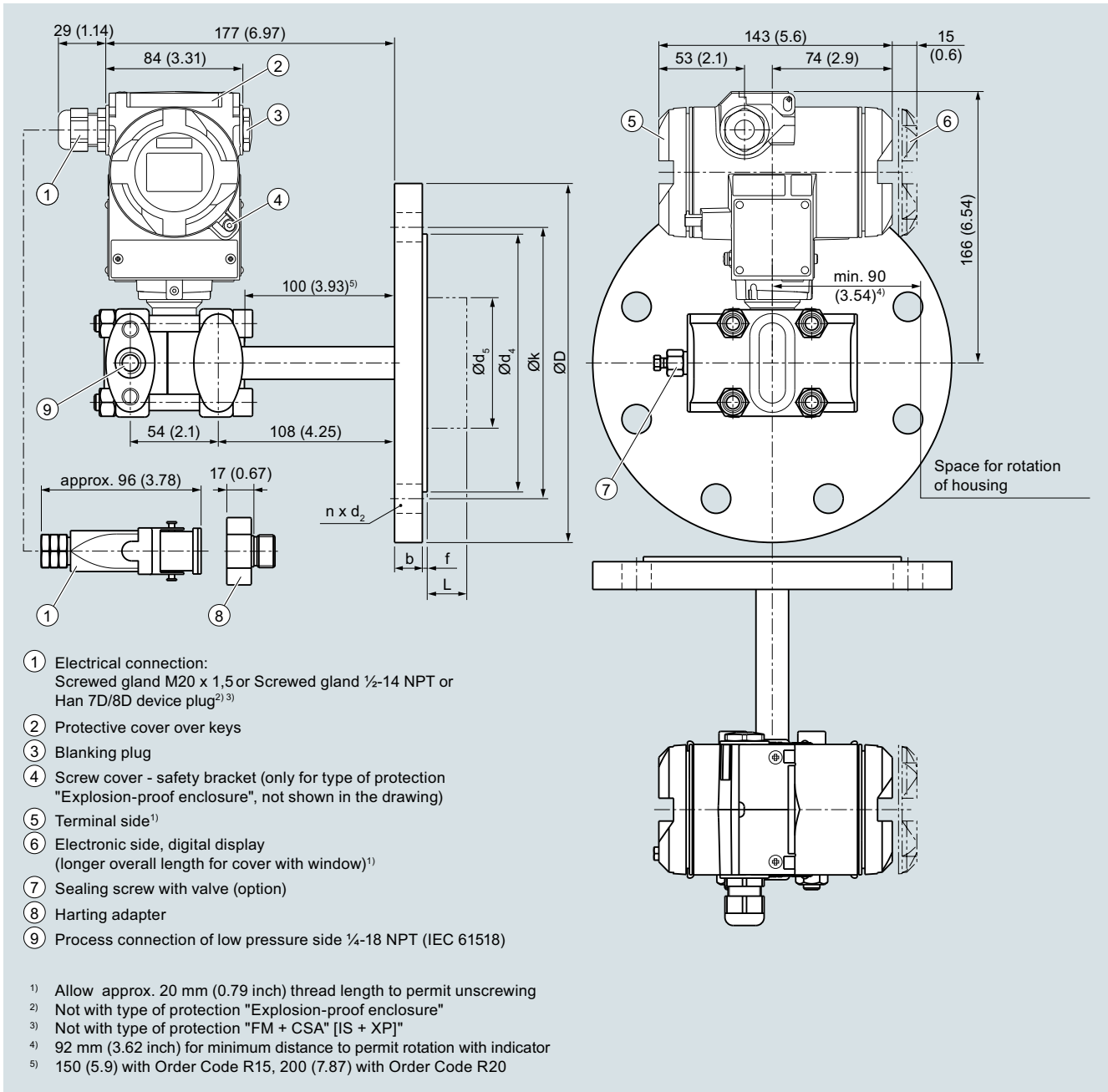
for level

1

Selection and Ordering data		Order code			
Further designs			HART	PA	FF
Add "-Z" to Article No. and specify Order code.					
Customer-specific tubus length	Y44	✓	✓	✓	
Select range, enter desired length in plain text (No entry = standard length)					
Spark arrester	A01	✓	✓	✓	
For mounting on zone 0 (incl. documentation)					
Remote seal nameplate	B20	✓	✓	✓	
attached out of stainless steel, contains Article No. and order number of the remote seal supplier					
Oil- and grease-free cleaned version	C10	✓	✓	✓	
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					
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11	✓	✓	✓	
Inspection certificate	C12	✓	✓	✓	
Acc. to EN 10204-3.1					
2.2 Certificate of FDA approval of fill oil	C17	✓	✓	✓	
Only in conjunction with filling liquid "Food oil" (FDA listed)"					
"Functional safety (SIL2)" certificate to IEC 61508	C20	✓	✓		
(only for conjunction with the Order code "C20" in the case of SITRANS P DS III transmitter)					
"Functional safety (SIL2/3)" certificate to IEC 61508	C23	✓	✓		
(only for conjunction with the Order code "C23" in the case of SITRANS P DS III transmitter)					
Certification acc. to NACE MR-0175	D07	✓	✓	✓	
Includes acceptance test certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)					
Certification acc. to NACE MR-0103	D08	✓	✓	✓	
Includes acceptance test certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)					
Oil- and grease-free cleaned version	E10	✓	✓	✓	
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					
Epoxy painting	E15	✓	✓	✓	
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.					

Selection and Ordering data		Order code			
Further designs			HART	PA	FF
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)	J11	✓	✓	✓	
previously DIN 2501, form E					
Sealing surface groove, EN 1092-1, form D	J14	✓	✓	✓	
instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)					
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	J12	✓	✓	✓	
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)					
Sealing surface RJF (groove, previously RTJ) ASME B16.5	J24	✓	✓	✓	
instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)					
Elongated pipe, 150 mm instead of 100 mm,	R15	✓	✓	✓	
max. medium temperature 250 °C, observe the maximum permissible media temperature of the filling liquid.					
Elongated pipe, 200 mm instead of 100 mm,	R20	✓	✓	✓	
max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.					
Negative pressure service					
for use in the low-pressure measuring range for transmitter for level Note: suffix "Y01" required with pressure transmitter		V04	✓	✓	✓
Extended negative pressure service					
for use in the low-pressure measuring range for transmitter for level Note: suffix "Y01" required with pressure transmitter ✓ = available		V54	✓	✓	✓

Dimensional drawings



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

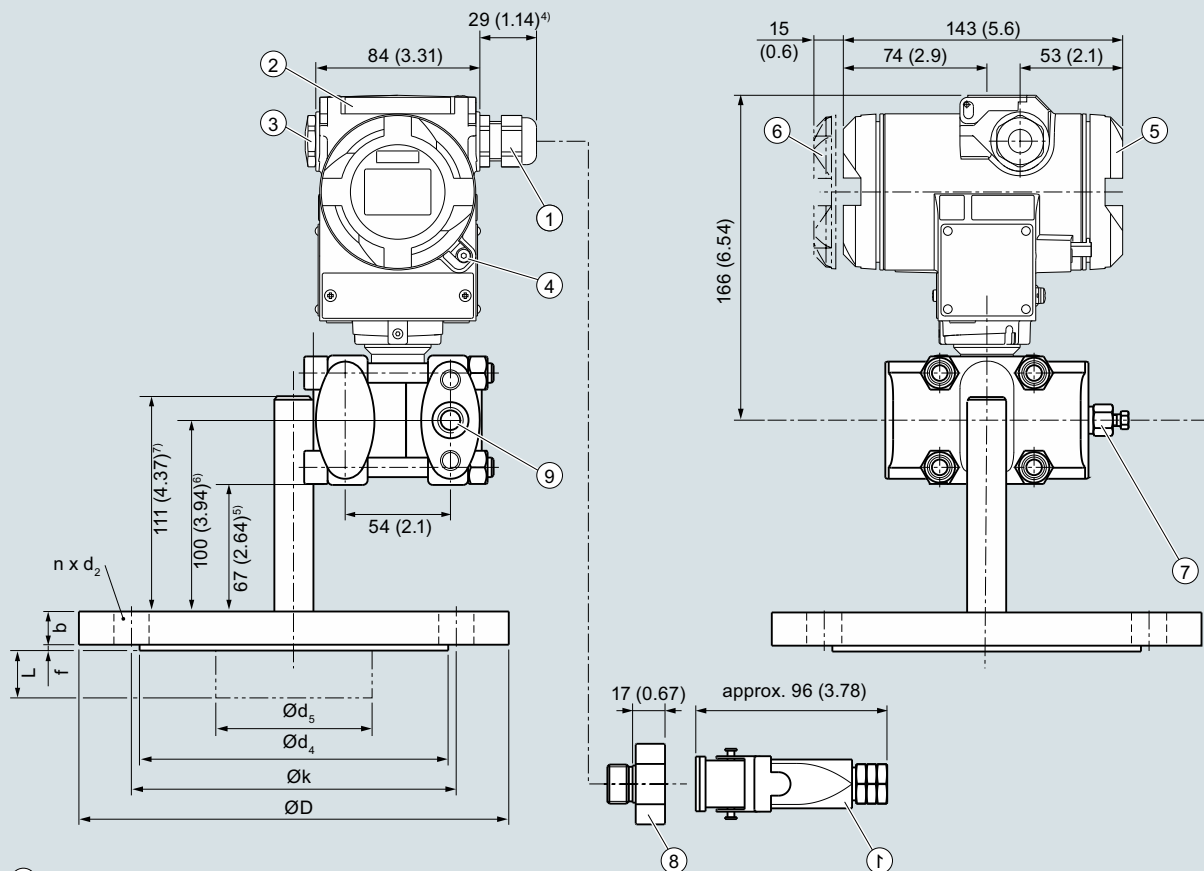
Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

for level



- 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 side¹⁾
- 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)

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)	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 diameter¹⁾ 59 mm = 2.32 inch with tube length L=0.²⁾ 89 mm = 3½ inch with tube length L=0.

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

Accessories/Spare Parts

1

Selection and Ordering data		Article No.
Replacement measuring cell for pressure for SITRANS P DS III		7MF4990 - 0 - 0 DB 0
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		
<ul style="list-style-type: none"> • Connection shank G$\frac{1}{2}$B to EN 837-1 • Female thread $\frac{1}{2}$-14 NPT • Oval flange made of stainless steel, max. span 160 bar (2320 psi) <ul style="list-style-type: none"> - Mounting thread $\frac{7}{16}$-20 UNF to IEC 61518/DIN EN 61518 - Mounting thread M10 to DIN 19213 		0 1 2 3
Further designs		Order code
Please add "-Z" to Article No. and specify Order code.		
Inspection certificate		C12
to EN 10204-3.1		

Selection and Ordering data		Article No.
Replacement measuring cell for absolute pressure for SITRANS P DS III (from the pressure series)		7MF4992 - 0 - 0 DB 0
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		
<ul style="list-style-type: none"> • Connection shank G$\frac{1}{2}$B to EN 837-1 • Female thread $\frac{1}{2}$-14 NPT • Oval flange made of stainless steel, max. span 160 bar (2320 psi) <ul style="list-style-type: none"> - Mounting thread $\frac{7}{16}$-20 UNF to IEC 61518/DIN EN 61518 - Mounting thread M10 to DIN 19213 		0 1 2 3
Further designs		Order code
Please add "-Z" to Article No. and specify Order code.		
Inspection certificate		C12
to EN 10204-3.1		

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 - - 0 DC 0
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)	KE
Wetted parts materials	
Seal diaphragm Parts of measuring cell	
Stainless steel Stainless steel	A
Hastelloy Stainless steel	B
Hastelloy Hastelloy	C
Tantalum Tantalum	E
Monel Monel	H
Gold Gold	L
Process connection	
Female thread 1/4-18 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	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
• FFP (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 G1/2B	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 1/2-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible	K04

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

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 - - 0 DC 0
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 ₂ O)	B
PN 160 (MAWP 2320 psi)	
1 ... 60 mbar (0.4 ... 24 inH ₂ O)	C
2.5 ... 250 mbar (1 ... 100 inH ₂ O)	D
6 ... 600 mbar (2.4 ... 240 inH ₂ O)	E
16 ... 1600 mbar (6.4 ... 642 inH ₂ O)	F
50 ... 5000 mbar (20 ... 2000 inH ₂ O)	G
0.3 ... 30 bar (4.35 ... 435 psi)	H
Wetted parts materials (stainless steel process flanges)	
Seal diaphragm Parts of measuring cell	
Stainless steel Stainless steel	A
Hastelloy Stainless steel	B
Hastelloy Hastelloy	C
Tantalum ²⁾ Tantalum	E
Monel ²⁾ Monel	H
Gold ²⁾ Gold	L
Process connection	
Female thread 1/4-18 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	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
• FFP (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 1/2-14 NPT inner process connection on the side in the middle of the process flange, vent valve not possible	K04

1) Not suitable for connection of remote seal

2) Only together with max. spans 250, 1600, 5000 and 30000 mbar (100 inH₂O, 642 inH₂O, 2000 inH₂O and 435 psi).

Pressure Measurement


Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

Accessories/Spare Parts

1

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		7MF4995 -  - 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
Measured span (min. ... max.)		
2.5 ... 250 mbar	(1 ... 100 inH ₂ O)	
6 ... 600 mbar	(2.4 ... 240 inH ₂ O)	D
16 ... 1600 mbar	(6.4 ... 642 inH ₂ O)	E
50 ... 5000 mbar	(20 ... 2000 inH ₂ O)	F
0.3 ... 30 bar	(4.35 ... 435 psi)	G
		H
Wetted parts materials		
(stainless steel process flanges)		
Seal diaphragm	Parts of measuring cell	
Stainless steel	Stainless steel	A
Hastelloy	Stainless steel	B
Gold ¹⁾	Gold	L
Process connection		
Female thread 1/4-18 NPT with flange connection		
• Sealing screw opposite process connection		
- Mounting thread 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. span 600 mbar (240 inH₂O)

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
Spare parts/Accessories		Digital indicator	7MF4997-1BR
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 • made of stainless steel 304/1.4301 • made of stainless steel 316L/1.4404	7MF4997-1AB 7MF4997-1AH 7MF4997-1AP	Including mounting material for SITRANS P DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus	
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 • made of stainless steel 304/1.4301 • made of stainless steel 316L/1.4404	7MF4997-1AC 7MF4997-1AJ 7MF4997-1AQ	Measuring point label • without inscription (5 units) • Printed (1 unit) Data according to Y01 or Y02, Y15, Y16 and Y99 (see "Pressure transmitters")	7MF4997-1CA 7MF4997-1CB-Z Y...:
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 • made of stainless steel 304/1.4301 • made of stainless steel 316L/1.4404	7MF4997-1AD 7MF4997-1AK 7MF4997-1AR	Mounting screws For measuring point label, grounding and connection terminals or for display (50 units)	7MF4997-1CD
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 • made of stainless steel 304/1.4301 • made of stainless steel 316L/1.4404	7MF4997-1AE 7MF4997-1AL 7MF4997-1AS	Sealing screws (1 set = 2 units) for process flange • made of stainless steel • made of Hastelloy	7MF4997-1CG 7MF4997-1CH
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 • made of stainless steel 304/1.4301 • made of stainless steel 316L/1.4404	7MF4997-1AF 7MF4997-1AM 7MF4997-1AT	Sealing screws with vent valve Complete (1 set = 2 units) • made of stainless steel • made of Hastelloy	7MF4997-1CP 7MF4997-1CQ
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 • with window	7MF4997-1BB 7MF4997-1BE	Application electronics • for SITRANS P DS III with HART • for SITRANS P DS III with PROFIBUS PA • for SITRANS P DS III with FOUNDATION Fieldbus	7MF4997-1DK 7MF4997-1DL 7MF4997-1DM
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 • with window	7MF4997-1BC 7MF4997-1BF	Connection board • for SITRANS P DS III • for SITRANS P DS III PROFIBUS PA and FOUNDATION Fieldbus	7MF4997-1DN 7MF4997-1DP
		O-rings for process flanges made of: • FPM (Viton) • PTFE (Teflon) • FEP (with silicone core, approved for food) • FFPM (Kalrez) • NBR (Buna N)	7MF4997-2DA 7MF4997-2DB 7MF4997-2DC 7MF4997-2DD 7MF4997-2DE
		Sealing ring for process connection	see "Fittings"
		Weldable sockets for PMC connection • PMC Style Standard: Thread 1½" • PMC Style Minibolt: front-flush 1"	7MF4997-2HA 7MF4997-2HB
		Gaskets for PMC connection (packing unit = 5 units) • PTFE seal for PMC Style Standard: Thread 1½" • Gasket made of Viton for PMC Style Minibolt: front-flush 1"	7MF4997-2HC 7MF4997-2HD
		Weldable socket for TG52/50 and TG52/150 connection • TG52/50 connection • TG52/150 connection	7MF4997-2HE 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 Material FKM (Viton); temperature range: -20 ... +200 °C (-4 ... +392 °F), 10 units • DN 25, PN 40 (M11) • 1", class 150 (M40)	7MF4997-2HH 7MF4997-2HK

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

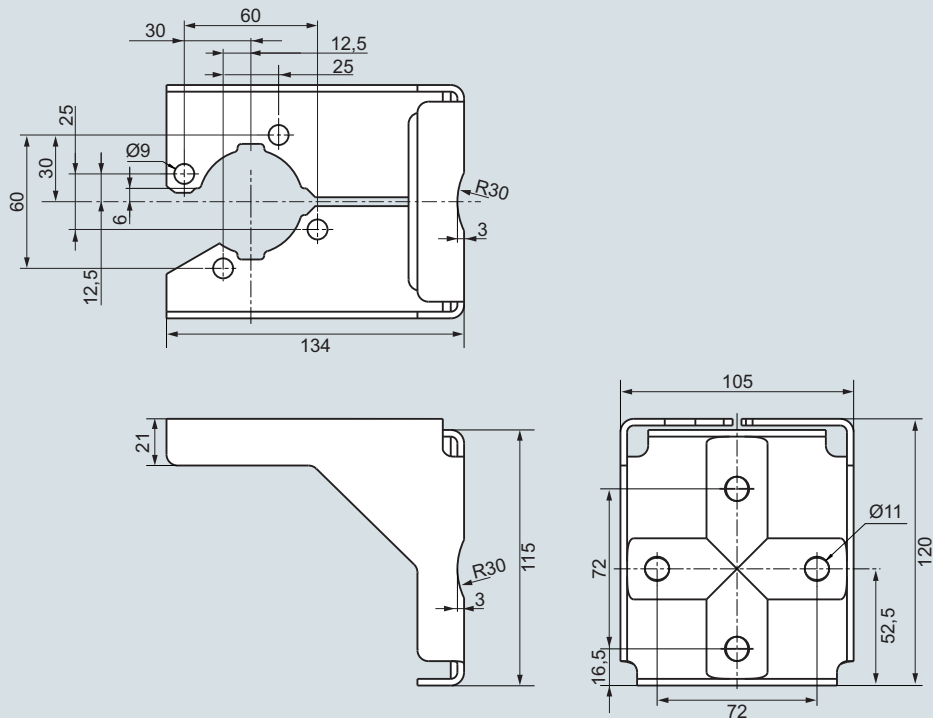
Accessories/Spare Parts

1

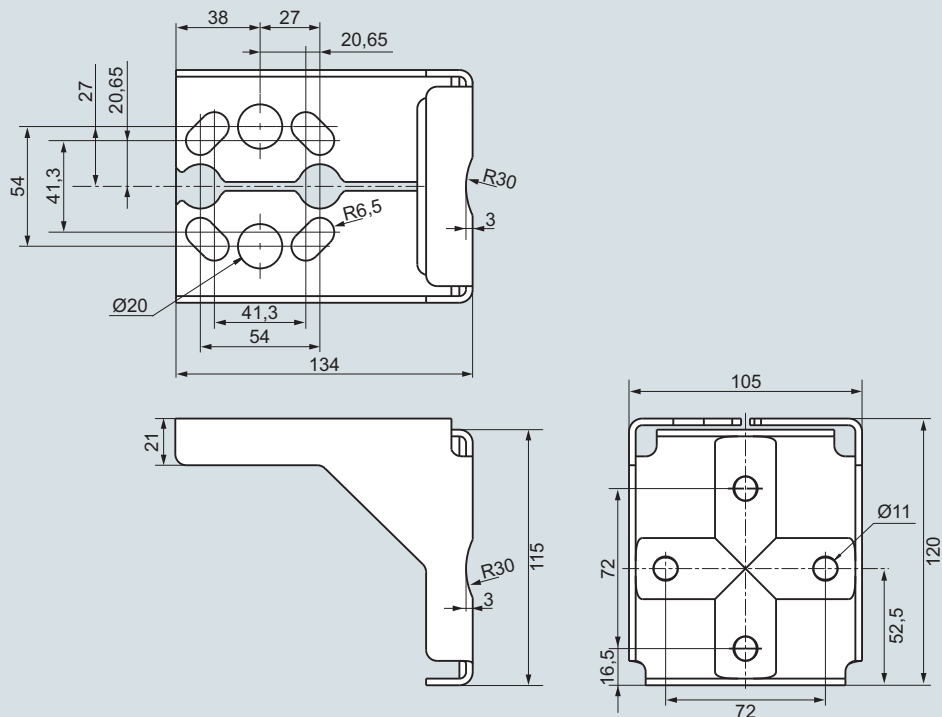
Selection and Ordering data	Article No.
Documentation The entire documentation is available for download free-of-charge in various languages at: http://www.siemens.com/processinstrumentation/documentation Compact operating instructions SITRANS P DS III/P410 • English, German, Spanish, French, Italian,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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P DS III

Factory-mounting of valve manifolds on transmitters

Overview

SITRANS P transmitters

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

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

- 7MF9011-4EA 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 gaskets made of PTFE between 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 sealing rings between the transmitter and the valve manifold.

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

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

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

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

Selection and Ordering data

7MF9411-5AA valve manifold for relative and absolute pressure transmitters



Add „-Z“ to the Article No. of the transmitter and add order codes.

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-pressure test certified by factory certificate according to EN 10204-2.2

Additional versions:

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)

Supplied acceptance test certificate to EN 10204- 3.1 for transmitters and mounted valve manifold

With manufacturer declaration according to NACE, MR-0175

Order code

T05

A02

C12

D07

7MF9411-5AA valve manifold for relative and absolute pressure transmitters



Add „-Z“ to the Article No. of the transmitter and add order codes.

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-pressure test certified by factory certificate according to EN 10204-2.2

Additional versions:

Delivery includes mounting brackets and mounting clips made of stainless steel (instead of the mounting bracket supplied with the transmitter)

Supplied acceptance test certificate to EN 10204- 3.1 for transmitters and mounted valve manifold

With manufacturer declaration according to NACE, MR-0175

Order code

T06

A02

C12

D07

Factory-mounting of valve manifolds on transmitters

1

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

Add **-Z** to the Article No. of the transmitter and add Order codes

SITRANS P DSIII
7MF403-...1-..., 7MF423-...1-...
With process connection
female thread 1/2-14 NPT
in-sealed with PTFE sealing tape
Delivery incl. high-pressure test certified
by test report to EN 10204-2.2

Order
code**T03****Further designs:**

Delivery includes mounting brackets and
mounting clips made of stainless steel
(instead of the mounting bracket supplied
with the transmitter)

A02

Supplied acceptance test certificate to
EN 10204- 3.1 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

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

Order
code**T02****Alternative sealing material:**

- Soft iron
- Stainless steel, Mat. No. 14571
- copper

A70**A71****A72**

Delivery incl. high-pressure test certified
by test report to EN 10204-2.2

Further designs:

Delivery includes mounting brackets and
mounting clips made of stainless steel
(instead of the mounting bracket supplied
with the transmitter)

A02

Supplied acceptance test certificate to
EN 10204- 3.1 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

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 test report to EN 10204-2.2

Order
code**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**

Supplied acceptance test certificate to
EN 10204-3.1 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

SITRANS P DSIII
7MF443-... and 7MF453-...¹⁾
mounted with gaskets made of PTFE and
screws made of
• chromized steel
• Stainless steel
Delivery incl. high-pressure test certified
by test report to EN 10204-2.2

Order
code**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**

Supplied acceptance test certificate to
EN 10204-3.1 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

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P DS III

Factory-mounting of valve manifolds on transmitters

Dimensional drawings

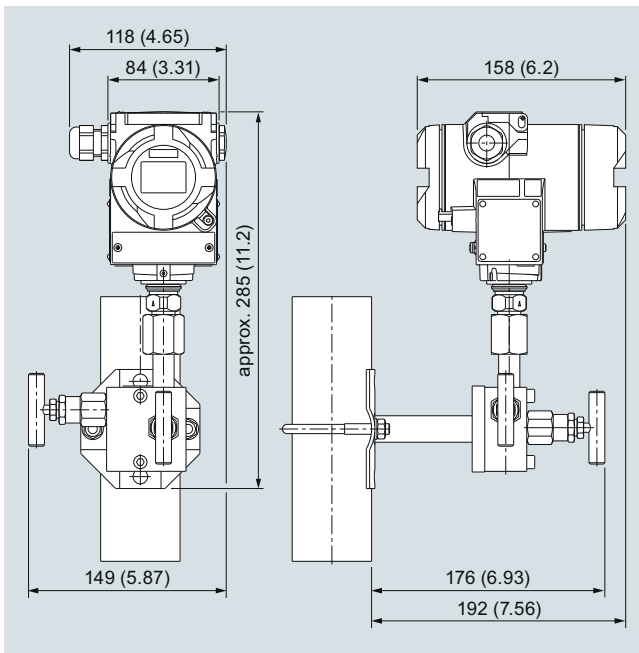
Valve manifolds mounted on SITRANS P DS III



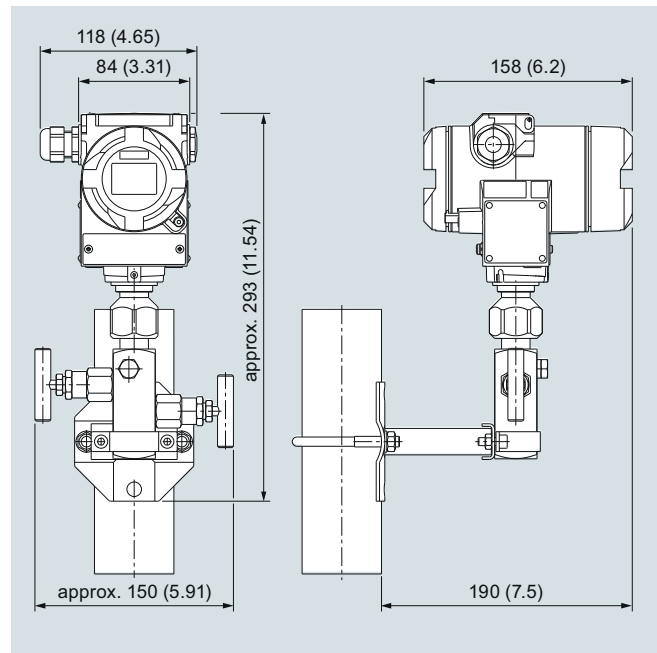
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters



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



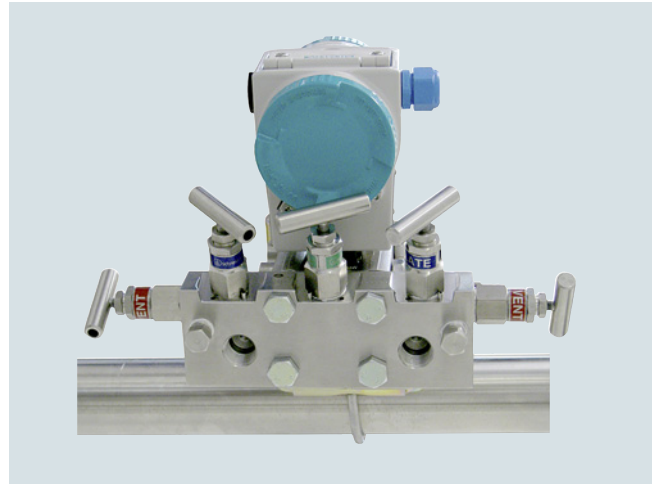
7MF9011-4EA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)



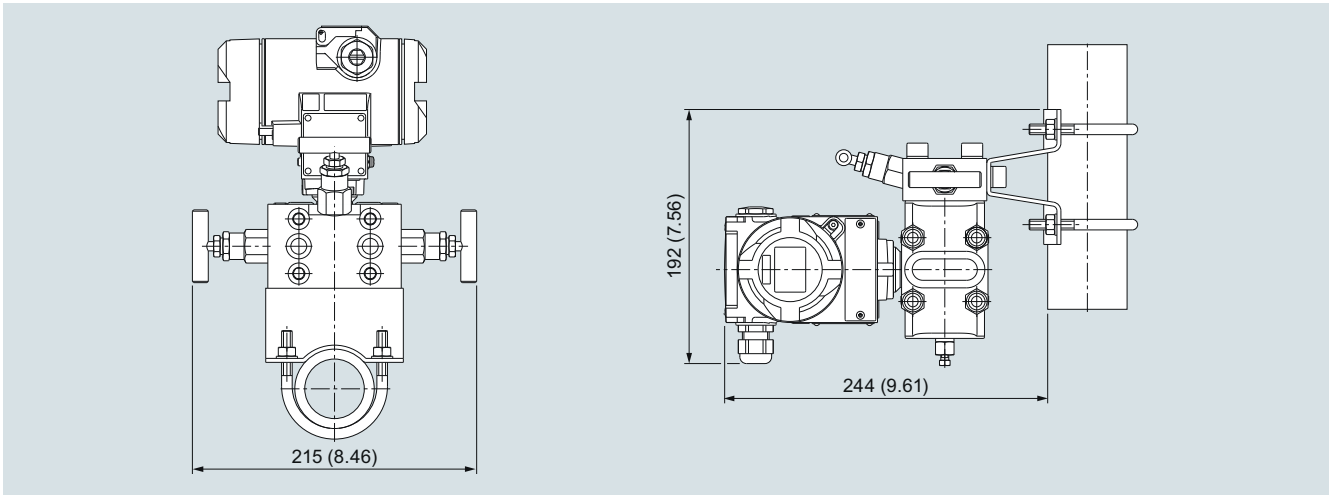
7MF9011-4FA valve manifold with mounted gauge pressure and absolute pressure transmitters, dimensions in mm (inch)



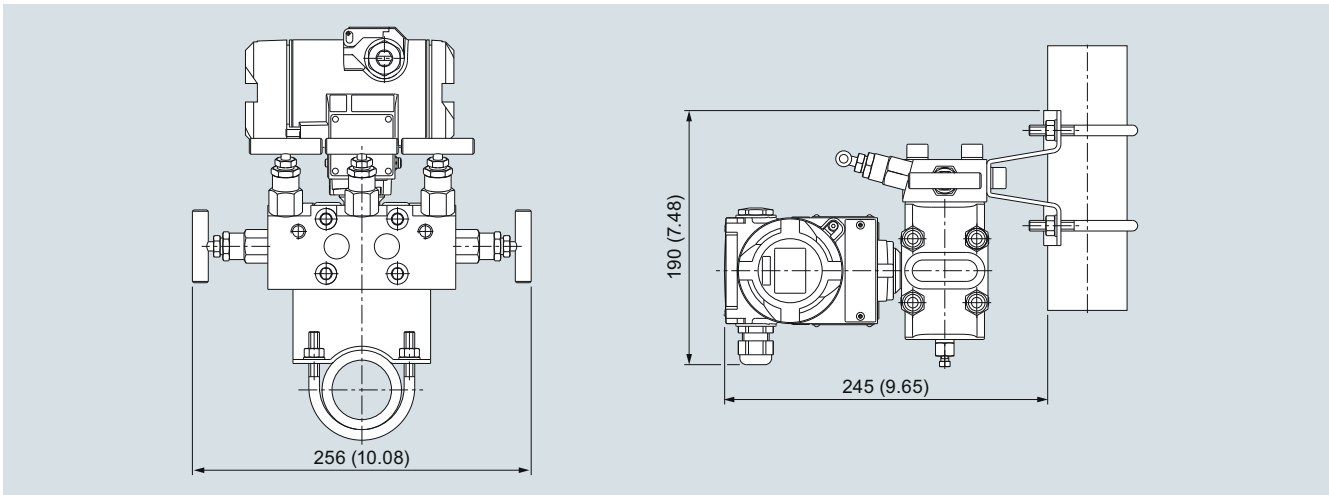
7MF9411-5BA valve manifold with mounted differential pressure transmitter



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)

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

Technical description

1

Overview



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

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

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

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

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

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

Benefits

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

Application

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

Pressure transmitters with type of protection "Flameproof enclosure" may be installed in hazardous areas (zone 1) or in zone 0. The pressure transmitters are provided with an EC type examination certificate and comply with the corresponding harmonized European standards (ATEX).

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

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

The pressure transmitter can be operated locally over 3 input buttons or programmed externally over HART or over PROFIBUS PA or FOUNDATION Fieldbus interface.

Pressure transmitter for gauge pressure

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

Span (infinitely adjustable)

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

Nominal measuring range

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

Pressure transmitters for differential pressure and flow

Measured variables:

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

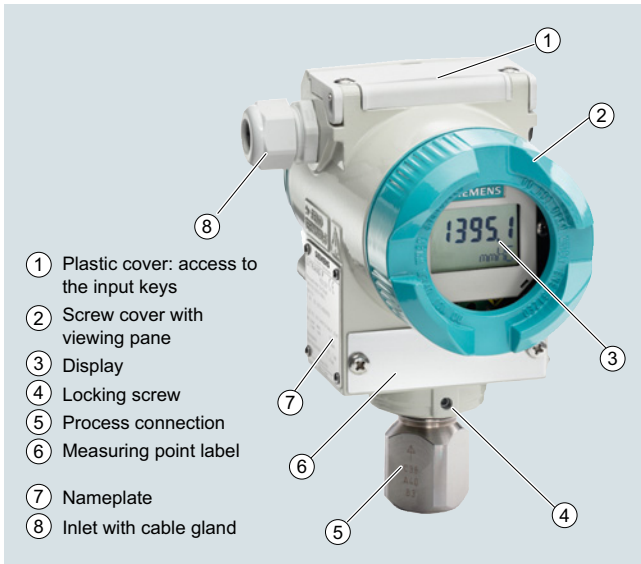
Span (infinitely adjustable)

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

Nominal measuring range

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

Design



Front view

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

The rating plate (7, Figure "Front view") with the Article No. is located on the side of the housing. The specified number together with the ordering information provide details on the optional design details and on the possible measuring range (physical properties of built-in sensor element).

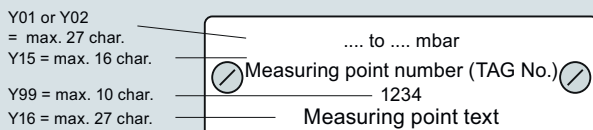
The approval label is located on the opposite side.

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

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

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

Example for an attached measuring point label



Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

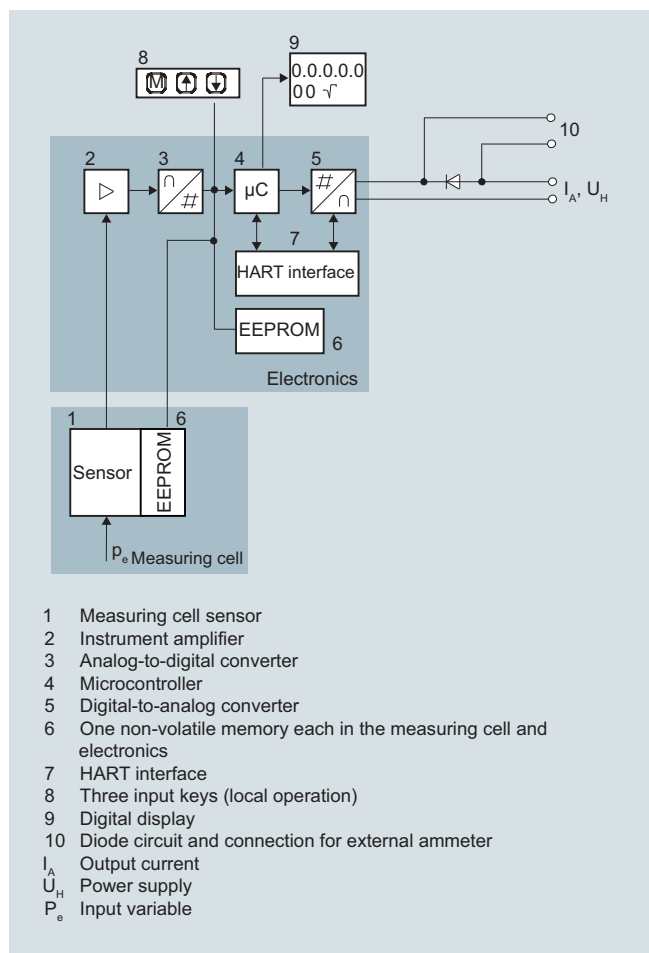
SITRANS P410

Technical description

1

Function

Operation of electronics with HART communication



Function diagram of electronics

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

The diode circuit (10) protects against incorrect polarity.

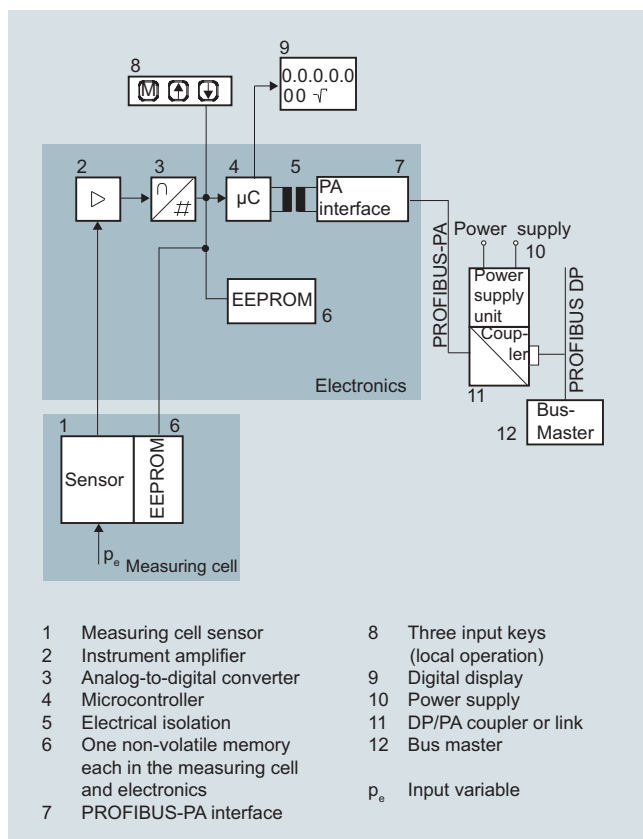
The data specific to the measuring cell, the electronics data, and the parameter data are stored in the two non-volatile memories (6). The one memory is coupled to the measuring cell, the other to the electronics. As the result of this modular design, the electronics and the measuring cell can be replaced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

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

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

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

Operation of electronics with PROFIBUS PA communication



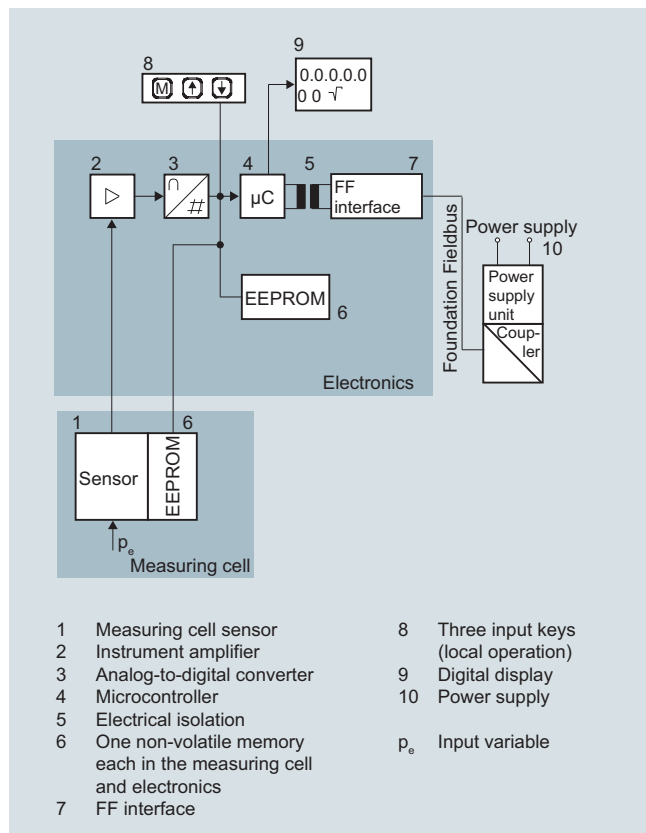
Function diagram of electronics

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

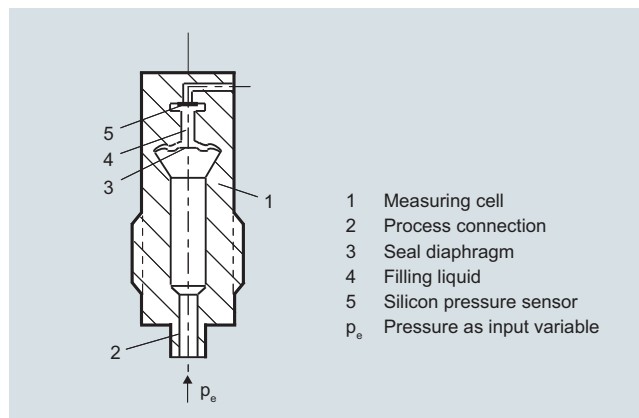
Function diagram of electronics

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.

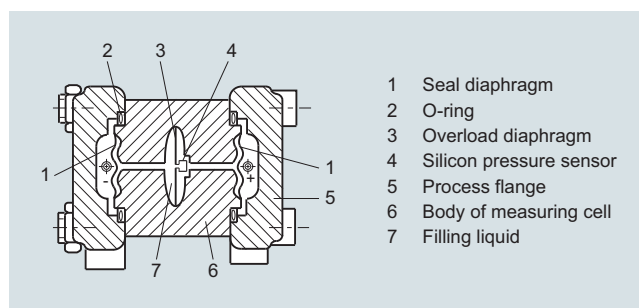
Using the three input buttons (8) you can parameterize the pressure transmitter directly at the measuring point. The input buttons can also be used to control the view of the results, the error messages and the operating modes on the display (9).

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 cellsMeasuring cell for gauge pressure

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

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.

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

Technical description

Parameterization SITRANS P410

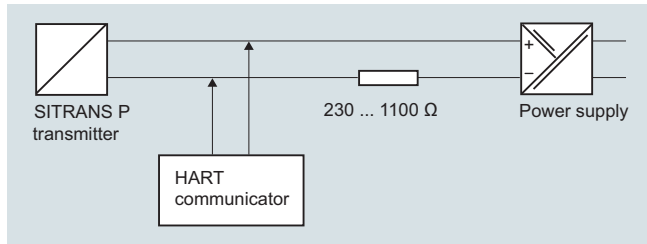
Depending on the version, there are a range of options for parameterizing the pressure transmitter and for setting or scanning the parameters.

Parameterization using the input buttons (local operation)

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

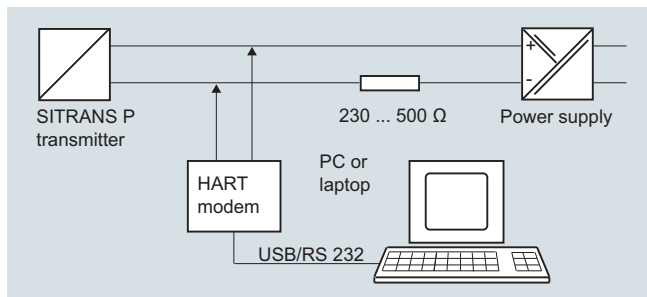
Parameterization using HART

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



Communication between a HART Communicator and a pressure transmitter

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



HART communication between a PC communicator and a pressure transmitter

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

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

Adjustable parameters, SITRANS P410 with HART

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

¹⁾ Cancel apart from write protection

²⁾ Only differential pressure

Diagnostic functions for SITRANS P410 with HART

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

Available physical units of display for SITRANS P410 with HART

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, bar, mbar, torr, atm, psi, g/cm ² , kg/cm ² , inH ₂ O, inH ₂ O (4 °C), mmH ₂ O, ftH ₂ O (20 °C), inHg, mmHg
Level (height data)	m, cm, mm, ft, in
Volume	m ³ , dm ³ , hl, yd ³ , ft ³ , in ³ , US gallon, Imp. gallon, bushel, barrel, barrel liquid
Mass	g, kg, t, lb, Ston, Lton, oz
volume flow	m ³ /d, m ³ /h, m ³ /s, l/min, l/s, ft ³ /d, ft ³ /min, ft ³ /s, US gallon/min, US gallon/s
Mass flow	t/d, t/h, t/min, kg/d, kg/h, kg/min, kg/s, g/d, g/h, g/min, g/s, lb/d, lb/h, lb/min, lb/s, Lton/d, Lton/h, Ston/d, Ston/h, Ston/min
Temperature	K, °C, °F, °R
Miscellaneous	%, mA

Parameterization through PROFIBUS PA interface

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

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

Parameterization through FOUNDATION Fieldbus interface

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

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

Adjustable parameters for SITRANS P410 with PROFIBUS PA and FOUNDATION Fieldbus

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

Diagnostic functions for SITRANS P410 with PROFIBUS PA and FOUNDATION Fieldbus

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

Physical dimensions available for the display

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

1

Technical specifications

SITRANS P410 for gauge pressure

Input

Measured variable

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

Gauge pressure

HART

PROFIBUS PA/ FOUNDATION Fieldbus

Span

Nominal measuring range

Max. operating pressure MAWP (PS)

Max. perm. test pressure

0.01 ... 1 bar
1 ... 100 kPa
0.15 ... 14.5 psi

1 bar
100 kPa
14.5 psi

4 bar
400 kPa
58 psi

6 bar
600 kPa
87 psi

0.04 ... 4 bar
4 ... 400 kPa
0.58 ... 58 psi

4 bar
400 kPa
58 psi

7 bar
0.7 MPa
102 psi

10 bar
1 MPa
145 psi

0.16 ... 16 bar
16 ... 1600 kPa
2.3 ... 232 psi

16 bar
1600 kPa
232 psi

21 bar
2.1 MPa
305 psi

32 bar
3.2 MPa
464 psi

0.63 ... 63 bar
63 ... 6300 kPa
9.1 ... 914 psi

63 bar
6300 kPa
914 psi

67 bar
6.7 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

Lower measuring limit

- Measuring cell with silicone oil filling

30 mbar a/3 kPa a/0.44 psi a

Upper measuring limit

100 % of max. span

Output

Output signal

4 ... 20 mA

Digital PROFIBUS PA and FOUNDATION Fieldbus signal

- Lower limit (infinitely adjustable)
- Upper limit (infinitely adjustable)

3.55 mA, factory preset to 3.84 mA
23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA

-

-

Load

- Without HART

$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$
 U_H : Power supply in V

-

- With HART

$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or
 $R_B = 230 \dots 1100 \Omega$ (HART Communicator)

-

Physical bus

-

IEC 61158-2

Protection against polarity reversal

Protected against short-circuit and polarity reversal. Each connection against the other with max. supply voltage.

Electrical damping (step width 0.1 s)

Set to 2 s (0 ... 100 s)

SITRANS P410 for gauge pressure**Measuring accuracy**

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

• Linear characteristic

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi

$$r \leq 5 : \leq 0.04 \%$$

$$5 < r \leq 100 : \leq (0.004 \cdot r + 0.045) \%$$
Influence of ambient temperature
(in percent 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
- 160 bar/16 MPa/2321 psi

$$\leq (0.05 \cdot r + 0.1) \%$$

$$\leq (0.025 \cdot r + 0.125) \%$$
Long-term stability (temperature change ± 30 °C (± 54 °F))

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi

$$\leq (0.25 \cdot r) \% \text{ in 5 years}$$

$$\leq (0.125 \cdot r) \% \text{ in 5 years}$$

Effect of mounting position

$$\leq 0.05 \text{ mbar}/0.005 \text{ kPa}/0.000725 \text{ psi per } 10^\circ \text{ inclination}$$

(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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

1

SITRANS P410 for gauge pressure

Rated conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

Type 4X

Temperature of medium

- Measuring cell with silicone oil filling
- Measuring cell with inert filling liquid
- In conjunction with dust explosion protection

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F)

-20 ... +60 °C (-4 ... +140 °F)

Ambient conditions

- 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-AISI 12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

- Connection shank
- Oval flange
- Seal diaphragm

Stainless steel, mat. no. 1.4404/316L or Hastelloy C4, mat. no. 2.4602

Stainless steel, mat. no. 1.4404/316L

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
- Stainless steel 304
- Stainless steel 316L

Sheet-steel, Mat. No. 1.0330, chrome-plated

Sheet stainless steel, mat. no. 1.4301 (SS 304)

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

Power supply U_H

Terminal voltage on transmitter

10.5 ... 45 V DC
10.5 ... 30 V DC in intrinsically-safe mode

PROFIBUS PA/ FOUNDATION Fieldbus

-

Power supply

Supplied through bus

Separate 24 V power supply necessary

-

No

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

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"

- Marking
- Permissible ambient temperature

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-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:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$

FISCO supply unit:

 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:

 $U_o = 24 \text{ V}$, $I_o = 174 \text{ mA}$, $P_o = 1 \text{ W}$

- Effective internal inductance/capacitance

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

• Explosion-proof "d"

- Marking
- Permissible ambient temperature

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

- Connection

To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$ To circuits with values: $U_H = 9 \dots 32 \text{ V DC}$

• Dust explosion protection for zone 20 (pending)

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da
 Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)

120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$

FISCO supply unit:

 $U_o = 17.5 \text{ V}$, $I_o = 380 \text{ mA}$, $P_o = 5.32 \text{ W}$

Linear barrier:

 $U_o = 24 \text{ V}$, $I_o = 250 \text{ mA}$, $P_o = 1 \text{ W}$

- Effective internal inductance/capacitance

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

• Dust explosion protection for zone 21/22 (pending)

- Marking
- Connection

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values:
 $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\max} = 1.2 \text{ W}$

To circuits with values:

 $U_H = 9 \dots 32 \text{ V DC}$; $P_{\max} = 1 \text{ W}$

• Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connections (Ex ic)

PTB 13 ATEX 2007 X

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

 $U_m = 45 \text{ V}$

To circuits with values:
 $U_i = 45 \text{ V}$

 $U_m = 32 \text{ V}$

FISCO supply unit ic:

 $U_o = 17.5 \text{ V}$, $I_o = 570 \text{ mA}$

Linear barrier:

 $U_o = 32 \text{ V}$, $I_o = 132 \text{ mA}$, $P_o = 1 \text{ W}$

- Effective internal inductance/capacitance

 $L_i = 0.4 \text{ mH}$, $C_i = 6 \text{ nF}$ $L_i = 7 \mu\text{H}$, $C_i = 1.1 \text{ nF}$

• Explosion protection acc. to FM (pending)

- Identification (XP/DIP) or (IS); (NI)

Certificate of Compliance 3008490

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)

- Identification (XP/DIP) or (IS)

Certificate of Compliance 1153651

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

Pressure Measurement

Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P410

for gauge pressure

HART communication

HART	230 ... 1100 Ω
Protocol	HART Version 5.x
Software for computer	SIMATIC PDM

PROFIBUS PA communication

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

FOUNDATION Fieldbus communication

Function blocks

- Analog input
 - Adaptation to customer-specific process variables
 - Electrical damping, adjustable
 - Simulation function
 - Failure mode
 - Limit monitoring
 - Square-rooted characteristic for flow measurement

• PID

• Physical block

Transducer blocks

- Pressure transducer block
 - Can be calibrated by applying two pressures
 - Monitoring of sensor limits
 - Simulation function: Measured pressure value, sensor temperature and electronics temperature

3 function blocks analog input, 1 function block PID

Yes, linearly rising or falling characteristic

0 ... 100 s

Output/input (can be locked within the device with a bridge)

parameterizable (last good value, substitute value, incorrect value)

Yes, one upper and lower warning limit and one alarm limit respectively

Yes

Standard FOUNDATION Fieldbus function block

1 resource block

1 transducer block Pressure with calibration, 1 transducer block LCD

Yes

Yes

Constant value or over parameterizable ramp function

Selection and Ordering data		Article No.	Order code
Pressure transmitter for gauge pressure, SITRANS P410 with HART		7MF4033-	-Z C41
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring cell filling	Measuring cell cleaning		
Silicone oil	normal	1	
Measuring span (min. ... max.)			
0.01 ... 1 bar	(0.15 ... 14.5 psi)	B	
0.04 ... 4 bar	(0.58 ... 58 psi)	C	
0.16 ... 16 bar	(2.32 ... 232 psi)	D	
0.63 ... 63 bar	(9.14 ... 914 psi)	E	
1.6 ... 160 bar	(23.2 ... 2320 psi)	F	
Wetted parts materials			
Seal diaphragm	Process connection		
Stainless steel	Stainless steel	A	
Hastelloy	Stainless steel	B	
Hastelloy	Hastelloy	C	
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT"		Y 1	
(recommended version) 1) 2) 3) 4)			
Version for diaphragm seals in conjunction with process connector "G½B connection shank" 1) 2) 3) 4)		Y 0	
Process connection			
• Connection shank G½B to EN 837-1		0	
• Female thread ½-14 NPT		1	
• Stainless steel oval flange with process connection (Oval flange has no female thread)			
- Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518		2	
- Mounting thread M10 to DIN 19213		3	
- Mounting thread M12 to DIN 19213		4	
• Male thread M20 x 1.5		5	
• Male thread ½-14 NPT		6	
Non-wetted parts materials			
• Housing made of die-cast aluminium		0	
• Housing stainless steel precision casting ⁵⁾		3	
Version			
• Standard version, German plate inscription, setting for pressure unit: bar		1	
• International version, English plate inscription, setting for pressure unit: bar		2	
• Chinese version, English plate inscription, setting for pressure unit: Pascal		3	
All versions include DVD with compact operating instructions in various EU languages.			
Explosion protection			
• None			A
• With ATEX, Type of protection:			
- "Intrinsic safety (Ex ia)"			B
- "Explosion-proof (Ex d)" ⁶⁾			D
- "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d) ⁷⁾			P
- "Ex nA/ic (Zone 2)" ⁸⁾			E
- "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)" ⁷⁾⁹⁾			R
• FM + CSA intrinsic safe (is) (pending) ¹⁰⁾			F
• FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D ⁷⁾⁹⁾¹⁰⁾			S
• With FM + CSA, Type of protection:			
- "Intrinsic Safe and Explosion Proof (is + xp)" ⁶⁾¹⁰⁾			NC
Electrical connection / cable entry			
• Screwed gland M20 x1 .5			B
• Screwed gland ½-14 NPT			C
• Device plug Han 7D (plastic housing) incl. mating connector ¹¹⁾			D
• Device plugs M12 (stainless steel) ¹¹⁾¹²⁾			F

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

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Selection and Ordering data

Article No.

Order code

Pressure transmitter for gauge pressure, SITRANS P410 with HART

7MF4033-

-

-Z C41

Display

- Without display
- Without visible display (display concealed, setting: mA)
- With visible display (setting: mA)
- with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)

0

1

6

7

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

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

- 1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-...Y... and 7MF4900-1...-B
- 4) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
- 5) Not in conjunction with Electrical connection "device plug Han 7D".
- 6) Without cable gland, with blanking plug
- 7) With enclosed cable gland Ex ia and blanking plug
- 8) Configurations with device plugs Han and M12 are only available in Ex ic.
- 9) Only in connection with IP66.
- 10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 11) Only in connection with Ex approval A, B or E.
- 12) M12 delivered without cable socket

Selection and Ordering data		Article No.	Order code
Pressure transmitter for gauge pressure			
SITRANS P410 with PROFIBUS PA (PA)		7MF4034-	-Z C41
SITRANS P410 with FOUNDATION Fieldbus (FF)		7MF4035-	-Z C41
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring cell filling	Measuring cell cleaning		
Silicone oil	normal		
Nominal measuring range			
1 bar	(14.5 psi)		
4 bar	(58 psi)		
16 bar	(232 psi)		
63 bar	(914 psi)		
160 bar	(2320 psi)		
Wetted parts materials			
Seal diaphragm	Process connection		
Stainless steel	Stainless steel		
Hastelloy	Stainless steel		
Hastelloy	Hastelloy		
Version for diaphragm seals in conjunction with process connector "female thread ½-14 NPT"			
(recommended version) ^{1) 2) 3) 4)}			
Version for diaphragm seals in conjunction with process connector "G½B connection shank" ^{1) 2) 3) 4)}			
Process connection			
<ul style="list-style-type: none"> • Connection shank G½B to EN 837-1 • Female thread ½-14 NPT • Stainless steel oval flange with process connection (Oval flange has no female thread) ⁵⁾ <ul style="list-style-type: none"> - Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 - Mounting thread M10 to DIN 19213 - Mounting thread M12 to DIN 19213 • Male thread M20 x 1.5 • Male thread ½ -14 NPT 			
Non-wetted parts materials			
<ul style="list-style-type: none"> • Housing made of die-cast aluminium • Housing stainless steel precision casting 			
Version			
<ul style="list-style-type: none"> • Standard version, German label inscription, setting of pressure unit: bar • International version, English label inscription, setting of pressure unit: psi • Chinese version, English label inscription, setting of pressure unit: kPa 			
All versions include DVD with compact operating instructions in various EU languages.			
Explosion protection			
<ul style="list-style-type: none"> • None • With ATEX, Type of protection: <ul style="list-style-type: none"> - "Intrinsic safety (Ex ia)" - "Explosion-proof (Ex d)"⁶⁾ - "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)⁷⁾ - "Ex nA/ic (Zone 2)"⁸⁾ - "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"^{7) 9)} • FM + CSA intrinsic safe (is)¹⁰⁾ • FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D⁷⁾⁹⁾¹⁰⁾ • With FM + CSA, Type of protection: <ul style="list-style-type: none"> - "Intrinsic Safe and Explosion Proof (is + xp)"⁶⁾¹⁰⁾ 			
Electrical connection/cable entry			
<ul style="list-style-type: none"> • Screwed gland M20 x 1.5 • Screwed gland ½-14 NPT • Device plugs M12 (stainless steel)^{11) 12)} 			

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

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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
- Without visible display (display concealed, setting: bar)
- With visible display (setting: bar)
- with customer-specific display (setting as specified, Order code "Y21" required)

0

1

6

7

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

- 1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF403-...Y.-... and 7MF4900-1...-B
- 4) The standard measuring cell filling of configurations with remote seals (Y) is silicone oil.
- 5) M10 fastening thread: Max. span 160 bar (2320 psi)
7/16-20 UNF and M12 fastening thread: Max. span 400 bar (5802 psi)
- 6) Without cable gland, with blanking plug.
- 7) With enclosed cable gland Ex ia and blanking plug.
- 8) Configurations with device plugs Han and M12 are only available in Ex ic.
- 9) Only in connection with IP66.
- 10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 11) M12 delivered without cable socket.
- 12) Only in connection with Ex approval A, B, E or F.

Selection and Ordering data	Order code			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
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 plugs¹⁾				
• 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 ₂ O and/or psi	B21	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2²⁾	C11	✓	✓	✓
Inspection certificate³⁾ Acc. to EN 10204-3.1	C12	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2	C14	✓	✓	✓
Acceptance certificate (EN 10204-3.1) PMI test of parts in contact with medium	C15	✓	✓	✓
Functional safety (SIL2) (pending) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓		
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓		
Increased measuring accuracy (mandatory specification for SITRANS P410)	C41	✓	✓	✓
PED for Russia with initial calibration mark	C99	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA	D05	✓		
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009)	D07	✓	✓	✓
Degree of protection IP66/IP68 (only for M20x1.5 and ½-14 NPT)	D12	✓	✓	✓
Supplied with oval flange (1 item), PTFE packing and screws in thread of oval flange	D37	✓	✓	✓
Capri cable gland 4F CrNi and clamping device (848699 + 810634) included	D59	✓	✓	✓
TAG plate empty (no inscription)	D61	✓	✓	✓

Selection and Ordering data	Order code			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
Use in or on zone 1D/2D⁴⁾ (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)	E01	✓	✓	✓
CRN approval Canada (Canadian Registration Number)	E22 ⁵⁾	✓	✓	✓
Dual seal	E24	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)	E55 ⁶⁾	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)	E56 ⁶⁾	✓	✓	✓
Ex protection "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)	E57 ⁶⁾	✓	✓	✓
Ex protection „Ex ia“, „Ex d" and „Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-R..)	E58 ⁶⁾	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (pending) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 ⁶⁾	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)	E80	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)	E81	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	E82	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	E83	✓	✓	✓
Two coats of lacquer on casing and cover (PU on epoxy)	G10	✓	✓	✓
Transient protector 6 kV (lightning protection)	J01	✓	✓	✓
Oval flange NAM (ASTAVA)	J06	✓	✓	✓
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓	✓
• Lloyds Register (LR)	S11	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	S12	✓	✓	✓
• American Bureau of Shipping (ABS)	S14	✓	✓	✓
• Russian Maritime Register (RMR)	S16	✓	✓	✓
• Korean Register of Shipping (KR)	S17	✓	✓	✓

Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/254).

1) Device plug Han IP65

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

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

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

5) Cannot be ordered with remote seal.

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for gauge pressure

1

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 ₂ O [*] , inH ₂ O [*] , ftH ₂ O [*] , 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 units²⁾ 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	✓		

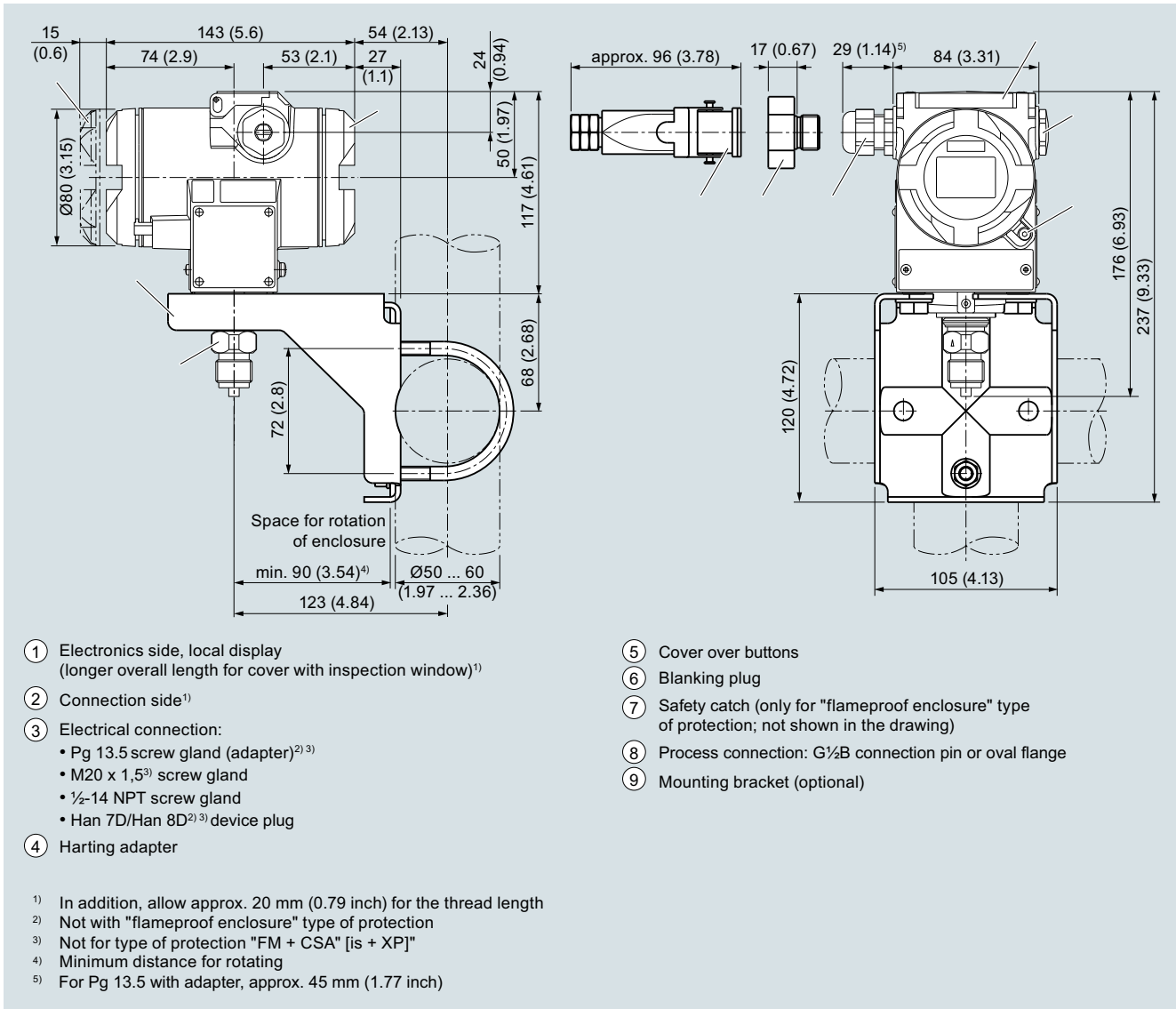
✓ = available

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

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

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Technical specifications

SITRANS P410 for differential pressure and flow

Input		Differential pressure and flow	
Measured variable		HART	PROFIBUS PA/ FOUNDATION Fieldbus
Span (fully adjustable) or measuring range, max. operating pressure (in accordance with 2014/68/EU Pressure Equipment Directive)		Span	Max. operating pressure MAWP (PS)
		2.5 ... 250 mbar 0.2 ... 25 kPa 1 ... 100 inH ₂ O	250 mbar 25 kPa 100 inH ₂ O
		6 ... 600 mbar 0.6 ... 60 kPa 2.4 ... 240 inH ₂ O	600 mbar 60 kPa 240 inH ₂ O
		16 ... 1600 mbar 1.6 ... 160 kPa 6.4 ... 642 inH ₂ O	1600 mbar 160 kPa 642 inH ₂ O
		50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH ₂ O	5000 mbar 500 kPa 2000 inH ₂ O
		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 ₂ O	600 mbar 60 kPa 240 inH ₂ O
		16 ... 1600 mbar 1.6 ... 160 kPa 6.4 ... 642 inH ₂ O	1600 mbar 160 kPa 642 inH ₂ O
		50 ... 5000 mbar 5 ... 500 kPa 20 ... 2000 inH ₂ O	5000 mbar 500 kPa 2000 inH ₂ O
		0.3 ... 30 bar 0.03 ... 3 MPa 4.35 ... 435 psi	30 bar 3 MPa 435 psi
Lower measuring limit		-100 % of max. span (-33 % with measuring cell 30 bar/3 MPa/435 psi) or 30 mbar a/3 kPa a/0.44 psi a	
• Measuring cell with silicone oil filling			
Upper measuring limit		100 % of max. span	
Start of scale value		Between the measuring limits (fully adjustable)	
Output		HART	PROFIBUS PA/ FOUNDATION Fieldbus
Output signal		4 ... 20 mA	Digital PROFIBUS PA and FOUNDATION Fieldbus signal
• Lower limit (infinitely adjustable)		3.55 mA, factory preset to 3.84 mA	-
• Upper limit (infinitely adjustable)		23 mA, factory preset to 20.5 mA or optionally set to 22.0 mA	-
Load		$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A}$ in Ω , U_H : Power supply in V	-
• Without HART		$R_B = 230 \dots 500 \Omega$ (SIMATIC PDM) or $R_B = 230 \dots 1100 \Omega$ (HART Communicator)	-
• With HART			
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**

Reference conditions

Acc. to IEC 60770-1

- Increasing characteristic
- Start-of-scale value 0 bar/kPa/psi
- Stainless steel seal diaphragm
- Silicone oil filling
- Room temperature 25 °C (77 °F)

Measuring span ratio r (spread, Turn-Down) $r = \text{max. measuring span/set measuring span or nom. pressure range}$

Error in measurement at limit setting incl. hysteresis and reproducibility

• Linear characteristic

- 250 mbar/25 kPa/3.63 psi
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi
- 30 bar/3 MPa/435 psi

 $r \leq 5 : \leq 0.04 \%$
 $5 < r \leq 100 : \leq (0.004 \cdot r + 0.045) \%$

• 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

 $r \leq 5 : \leq 0.04 \%$
 $5 < r \leq 100 : \leq (0.004 \cdot r + 0.045) \%$

• 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

 $r \leq 5 : \leq 0.08 \%$
 $5 < r \leq 100 : \leq (0.008 \cdot r + 0.09) \%$

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

 $\leq (0.025 \cdot r + 0.125) \%$

Influence of static pressure

• on the zero point (PKN)

- 250 mbar/25 kPa/3.63 psi
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi

 $\leq (0.1 \cdot r) \% \text{ per } 70 \text{ bar}$
 (zero offset is possible with position error adjustment)

- 5 bar/500 kPa/72.5 psi
- 30 bar/3 MPa/435 psi

 $\leq (0.2 \cdot r) \% \text{ per } 70 \text{ bar}$
 (zero offset is possible with position error adjustment)

• on the span (PKS)

- 250 mbar/25 kPa/3.63 psi
- 600 mbar/60 kPa/8.7 psi
- 1600 mbar/160 kPa/23.21 psi
- 5 bar/500 kPa/72.5 psi
- 30 bar/3 MPa/435 psi

 $\leq 0.14 \% \text{ per } 70 \text{ bar}$ Long-term stability (temperature change $\pm 30 \text{ °C}$ ($\pm 54 \text{ °F}$))

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

 $\leq (0.125 \cdot r) \% \text{ in } 5 \text{ years}$

- 30 bar/3 MPa/435 psi

 $\leq (0.25 \cdot r) \% \text{ in } 5 \text{ years}$

Effect of mounting position (in pressure per change in angle)

 $\leq 0.7 \text{ mbar}/0.07 \text{ kPa}/0.028 \text{ inH}_2\text{O} \text{ per } 10^\circ \text{ inclination}$
 (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

Pressure Measurement

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for applications with advanced requirements (Advanced)

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for differential pressure and flow

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SITRANS P410 for differential pressure and flow

Rated conditions

Degree of protection

- according to EN 60529
- according to NEMA 250

IP66 (optional IP66/IP68)

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-AISI12 or stainless steel precision casting, mat. no. 1.4408

Wetted parts materials

- Seal diaphragm
- Process flanges and sealing screw
- O-Ring

Stainless steel, mat. no. 1.4404/316L or Hastelloy C276, mat. no. 2.4819

Stainless steel, mat. no. 1.4408, Hastelloy C4, mat. no. 2.4602

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 1/4-18 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
- Stainless steel 304
- Stainless steel 316L

Sheet-steel, Mat. No. 1.0330, chrome-plated

Sheet stainless steel, mat. no. 1.4301 (SS 304)

Sheet stainless steel, mat. no. 1.4404 (SS 316L)

Power supply U_H

Terminal voltage on transmitter

10.5 ... 45 V DC

10.5 ... 30 V DC in intrinsically-safe mode

PROFIBUS PA/ FOUNDATION Fieldbus

-

Power supply

Supplied through bus

Separate 24 V power supply necessary

-

No

Bus voltage

- Not Ex
- With intrinsically-safe operation

-

9 ... 32 V

-

9 ... 24 V

Current consumption

- Basic current (max.)
- Start-up current ≤ basic current
- Max. current in event of fault

-

12.5 mA

-

Yes

-

15.5 mA

Fault disconnection electronics (FDE) available

-

Yes

SITRANS P410 for differential pressure and flow**Certificates and approvals**

Classification according to PED 2014/68/EU

Explosion protection

• Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Connection

- Effective internal inductance/capacitance

• Explosion-proof "d"

- Marking
- Permissible ambient temperature

- Connection

• Dust explosion protection for zone 20 (pending)

- Marking
- Permissible ambient temperature
- Max. surface temperature
- Connection

- Effective internal inductance/capacitance

• Dust explosion protection for zone 21/22 (pending)

- Marking
- Connection

• Type of protection "n" (zone 2)

- Marking
- Connection (Ex nA)
- Connection (Ex ic)

- Effective internal inductance/capacitance

• Explosion protection acc. to FM (pending)

- Identification (XP/DIP) or (IS); (NI)

• Explosion protection to CSA (pending)

- Identification (XP/DIP) or (IS)

HART

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

PTB 13 ATEX 2007 X

Ex II 1/2 G Ex ia/ib IIC T4/T5/T6 Ga/Gb

-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

To certified intrinsically-safe circuits with peak values:
 $U_i = 30\text{ V}$, $I_i = 100\text{ mA}$, $P_i = 750\text{ mW}$;
 $R_i = 300\ \Omega$

 $L_i = 0.4\text{ mH}$, $C_i = 6\text{ nF}$

PTB 99 ATEX 1160

Ex II 1/2 G Ex d IIC T4/T6 Ga/Gb

-40 ... +85 °C (-40 ... +185 °F) temperature class T4;
 -40 ... +60 °C (-40 ... +140 °F) temperature class T6

To circuits with values: $U_H = 10.5 \dots 45\text{ V}$ DC

PTB 01 ATEX 2055

Ex II 1 D Ex ta IIIC T120°C Da

Ex II 1/2 D Ex ta/tb IIIC T120°C Da/Db

-40 ... +85 °C (-40 ... +185 °F)
 120 °C (248 °F)

To certified intrinsically-safe circuits with peak values:
 $U_i = 30\text{ V}$, $I_i = 100\text{ mA}$,
 $P_i = 750\text{ mW}$, $R_i = 300\ \Omega$

 $L_i = 0.4\text{ mH}$, $C_i = 6\text{ nF}$

PTB 01 ATEX 2055

Ex II 2 D Ex tb IIIC T120°C Db

To circuits with values: $U_H = 10.5 \dots 45\text{ V}$ DC; $P_{\max} = 1.2\text{ W}$

PTB 13 ATEX 2007 X

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

 $U_m = 45\text{ V}$ To circuits with values:
 $U_i = 45\text{ V}$ $L_i = 0.4\text{ mH}$, $C_i = 6\text{ nF}$

Certificate of Compliance 3008490

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

Certificate of Compliance 1153651

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

PROFIBUS PA/ FOUNDATION FieldbusFISCO supply unit:
 $U_o = 17.5\text{ V}$, $I_o = 380\text{ mA}$, $P_o = 5.32\text{ W}$ Linear barrier:
 $U_o = 24\text{ V}$, $I_o = 250\text{ mA}$, $P_o = 1.2\text{ W}$ $L_i = 7\ \mu\text{H}$, $C_i = 1.1\text{ nF}$ To circuits with values: $U_H = 9 \dots 32\text{ V}$ DCFISCO supply unit:
 $U_o = 17.5\text{ V}$, $I_o = 380\text{ mA}$, $P_o = 5.32\text{ W}$ Linear barrier:
 $U_o = 24\text{ V}$, $I_o = 250\text{ mA}$, $P_o = 1\text{ W}$ $L_i = 7\ \mu\text{H}$, $C_i = 1.1\text{ nF}$ To circuits with values: $U_H = 9 \dots 32\text{ V}$ DC;
 $P_{\max} = 1\text{ W}$ $U_m = 32\text{ V}$ FISCO supply unit ic:
 $U_o = 17.5\text{ V}$, $I_o = 570\text{ mA}$ Linear barrier:
 $U_o = 32\text{ V}$, $I_o = 132\text{ mA}$, $P_o = 1\text{ W}$ $L_i = 7\ \mu\text{H}$, $C_i = 1.1\text{ nF}$

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

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HART communication		FOUNDATION Fieldbus communication	
HART	230 ... 1100 Ω	Function blocks	3 function blocks analog input, 1 function block PID
Protocol	HART Version 5.x		
Software for PC	SIMATIC PDM		
PROFIBUS PA communication			
Simultaneous communication with master class 2 (max.)	4	• Analog input	Yes, linearly rising or falling characteristic
The address can be set using	Configuration tool or local operation (standard setting address 126)	- Adaptation to customer-specific process variables	0 ... 100 s
Cyclic data usage		- Electrical damping, adjustable	Output/input (can be locked within the device with a bridge)
• Output byte	5 (one measured value) or 10 (two measured values)	- Simulation function	parameterizable (last good value, substitute value, incorrect value)
• Input byte	0, 1, or 2 (register operating mode and reset function for metering)	- Failure mode	Yes, one upper and lower warning limit and one alarm limit respectively
Internal preprocessing		- Limit monitoring	Yes
Device profile	PROFIBUS PA Profile for Process Control Devices Version 3.0, class B	- Square-rooted characteristic for flow measurement	
Function blocks	2	• PID	Standard FOUNDATION Fieldbus function block
• Analog input		• Physical block	1 resource block
- Adaptation to customer-specific process variables	Yes, linearly rising or falling characteristic	Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
- Electrical damping, adjustable	0 ... 100 s		
- Simulation function	Input /Output	• Pressure transducer block	
- Failure mode	parameterizable (last good value, substitute value, incorrect value)	- Can be calibrated by applying two pressures	Yes
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively	- Monitoring of sensor limits	Yes
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output	- Simulation function: Measured pressure value, sensor temperature and electronics temperature	Constant value or over parameterizable ramp function
- 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		

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 ₂ O)	D	
6 ... 600 mbar	(2.409 ... 240.9 inH ₂ O)	E	
16 ... 1600 mbar	(6.424 ... 642.4 inH ₂ O)	F	
50 ... 5000 mbar	(20.08 ... 2008 inH ₂ O)	G	
0.3 ... 30 bar	(4.35 ... 435 psi)	H	
Wetted parts materials			
(stainless steel process flanges)			
Seal diaphragm	Parts of measuring cell		
Stainless steel	Stainless steel	A	
Hastelloy	Stainless steel	B	
Hastelloy	Hastelloy	C	
Version for diaphragm seal ^{1) 2) 3) 4)}		Y	
Process connection			
Female thread 1/4-18 NPT with flange connection			
<ul style="list-style-type: none"> Sealing screw opposite process connection <ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M10 to DIN 19213 (only for replacement requirement) Vent on side of process flange⁵⁾ <ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M10 to DIN 19213 (only for replacement requirement) 		2	
		0	
		6	
		4	
Non-wetted parts materials			
process flange screws	Electronics housing		
Stainless steel	Die-cast aluminum	2	
Stainless steel	Stainless steel precision casting ⁶⁾	3	
Version			
<ul style="list-style-type: none"> Standard version, German plate inscription, setting for pressure unit: bar International version, English plate inscription, setting for pressure unit: bar Chinese version, English plate inscription, setting for pressure unit: Pascal All versions include DVD with compact operating instructions in various EU languages.		1	
		2	
		3	
Explosion protection			
<ul style="list-style-type: none"> None With ATEX, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety (Ex ia)" "Explosion-proof (Ex d)"⁷⁾ "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)⁸⁾ "Ex nA/ic (Zone 2)"⁹⁾ "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia+ Ex d + Zone 1D/2D)"⁸⁾¹⁰⁾ FM + CSA intrinsic safe (is) (pending)¹¹⁾ FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D⁸⁾¹⁰⁾¹¹⁾ With FM + CSA, Type of protection: <ul style="list-style-type: none"> "Intrinsic Safe and Explosion Proof (is + xp)"⁷⁾¹¹⁾ 		A	
		B	
		D	
		P	
		E	
		R	
		F	
		S	
		NC	

Pressure Measurement


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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 <ul style="list-style-type: none"> • Screwed gland M20 x 1.5 • Screwed gland ½-14 NPT • Device plug Han 7D (plastic housing) incl. mating connector¹²⁾¹³⁾ • Device plugs M12 (stainless steel)¹⁴⁾¹⁵⁾ 		B C D F
Display <ul style="list-style-type: none"> • Without display • Without visible display (display concealed, setting: mA) • With visible display (setting: mA) • with customer-specific display (setting as specified, Order code "Y21" or "Y22" required) 		0 1 6 7

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

Included in delivery of the device:

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

- 1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 3) The diaphragm seal is to be specified with a separate order number and must be included with 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 mm²
- 14) Only in connection with Ex approval A, B, E or F.
- 15) M12 delivered without cable socket.

Selection and Ordering data		Article No.	Order code
Pressure transmitters for differential pressure and flow PN 160 (MAWP 2320 psi)			
SITRANS P410 with PROFIBUS PA (PA)		7MF4434-	-Z C41
SITRANS P410 with FOUNDATION Fieldbus (FF)		7MF4435-	-Z C41
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring cell filling	Measuring cell cleaning		
Silicone oil	normal		
Nominal measuring range			
250 mbar (100.4 inH ₂ O)			
600 mbar (240.9 inH ₂ O)			
1600 mbar (642.4 inH ₂ O)			
5 bar (2008 inH ₂ O)			
30 bar (435 psi)			
Wetted parts materials			
(stainless steel process flanges)			
Seal diaphragm	Parts of measuring cell		
Stainless steel	Stainless steel		
Hastelloy	Stainless steel		
Hastelloy	Hastelloy		
Version as diaphragm seal 1) 2) 3) 4)			
Process connection			
Female thread 1/4-18 NPT with flange connection			
<ul style="list-style-type: none"> Sealing screw opposite process connection <ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M10 to DIN 19213 (only for replacement requirement) Venting on side of process flanges 5) <ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M10 to DIN 19213 (only for replacement requirement) 			
Non-wetted parts materials			
process flange screws	Electronics housing		
Stainless steel	Die-cast aluminum		
Stainless steel	Stainless steel precision casting		
Version			
<ul style="list-style-type: none"> Standard version, German plate inscription, setting for pressure unit: bar International version, English plate inscription, setting for pressure unit: bar Chinese version, English plate inscription, setting for pressure unit: Pascal All versions include DVD with compact operating instructions in various EU languages.			
Explosion protection			
<ul style="list-style-type: none"> None With ATEX, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety (Ex ia)" "Explosion-proof (Ex d)"⁶⁾ "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)⁷⁾ "Ex nA/ic (Zone 2)"⁸⁾ "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)^{7) 9)} (not for DS III FF) FM + CSA intrinsic safe (is) (pending)¹⁰⁾ FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D⁷⁾⁹⁾¹⁰⁾ With FM + CSA, Type of protection: <ul style="list-style-type: none"> "Intrinsic Safe and Explosion Proof (is + xp)⁸⁾¹⁰⁾ 			
Electrical connection/cable entry			
<ul style="list-style-type: none"> Screwed gland M20 x 1.5 Screwed gland 1/2-14 NPT Device plugs M12 (stainless steel)^{11) 12)} 			

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for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

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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
- Without visible display (display concealed, setting: bar)
- With visible display (setting: bar)
- With customer-specific display (setting as specified, Order code "Y21" required)

0
1
6
7

Included in delivery of the device:

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

- 1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 3) The diaphragm seal is to be specified with a separate order number and must be included with the transmitter order number, for example 7MF443-...Y...-... and 7MF4900-1...-B
- 4) The standard measuring cell filling for configurations with remote seals (Y) is silicone oil.
- 5) Not suitable for connection of remote seal. Position of the top vent valve in the process flange (see dimensional drawing).
- 6) Without cable gland, with blanking plug.
- 7) With enclosed cable gland Ex ia and blanking plug.
- 8) Configurations with device plugs Han and M12 are only available in Ex ic.
- 9) Only in connection with IP66.
- 10) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 11) Only in connection with Ex approval A, B, E or F.
- 12) M12 delivered without cable socket

Selection and Ordering data	Order code			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
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	✓	✓	✓
• FFP (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	✓
• NBR (Buna N)	A23	✓	✓	✓
Device plugs¹⁾				
• Han 7D (metal)	A30	✓		
• Han 8D (instead of Han 7D)	A31	✓		
• Angled	A32	✓		
• Han 8D (metal)	A33	✓		
Sealing screws (2 units) ¼-18 NPT, with valve in mat. of process flanges	A40	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))	A50	✓	✓	✓
Rating plate inscription (instead of German)				
• English	B11	✓	✓	✓
• French	B12	✓	✓	✓
• Spanish	B13	✓	✓	✓
• Italian	B14	✓	✓	✓
English rating plate Pressure units in inH ₂ O and/or psi	B21	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2²⁾	C11	✓	✓	✓
Inspection certificate³⁾ to EN 10204-3.1	C12	✓	✓	✓
Factory certificate to EN 10204-2.2	C14	✓	✓	✓
Acceptance certificate (EN 10204-3.1) PMI test of parts in contact with medium	C15	✓	✓	✓
Functional safety (SIL2) (pending) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C20	✓		
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration	C23	✓		
Increased measuring accuracy (mandatory specification for SITRANS P410)	C41	✓	✓	✓
PED for Russia with initial calibration mark	C99	✓	✓	✓

Selection and Ordering data	Order code			
Further designs Add "-Z" to Article No. and specify Order code.		HART	PA	FF
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/2D⁴⁾ (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)	E01	✓	✓	✓
Dual seal	E24	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)	E55 ⁵⁾	✓	✓	✓
Explosion protection "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)	E56 ⁵⁾	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)	E57 ⁵⁾	✓	✓	✓
Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China) (only for transmitter 7MF4...-.....-R..)	E58 ⁵⁾	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (pending) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)	E70 ⁵⁾	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)	E80	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)	E81	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)	E82	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)	E83	✓	✓	✓
Two coats of lacquer on casing and cover (PU on epoxy)	G10	✓	✓	✓
Interchanging of process connection side	H01	✓	✓	✓
Vent on side for gas measurements	H02	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines (not together with K01, K02 and K04) ⁶⁾	H03	✓	✓	✓

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

1

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)⁷⁾	J08	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)⁷⁾	J09	✓	✓	✓
Marine approvals				
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓	✓
• Lloyds Register (LR)	S11	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	S12	✓	✓	✓
• American Bureau of Shipping (ABS)	S14	✓	✓	✓
• Russian Maritime Register (RMR)	S16	✓	✓	✓
• Korean Register of Shipping (KR)	S17	✓	✓	✓

Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/254).

✓ = available

1) Device plug Han IP65

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

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

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

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

6) Not suitable for connection of remote seal.

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

Selection and Ordering data	Order code			
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: • in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi • in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	Y01 Y02	✓ ✓	✓ 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 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 ₂ O ⁺ , inH ₂ O ⁺ , ftH ₂ O ⁺ , 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 units²⁾ 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 ³⁾ + Y01 or Y02	✓		
Preset bus address possible between 1 and 126 Specify in plain text: Y25:	Y25		✓	✓
Damping adjustment in seconds (0 ... 100 s)	Y30	✓	✓	✓

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

✓ = available

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

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

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

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

1

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
- Without visible display (display concealed, setting: mA)
- With visible display (setting: mA)
- with customer-specific display (setting as specified, Order code "Y21" or "Y22" required)

0
1
6
7

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

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

- 1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) If the acceptance test certificate 3.1 is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 3) The diaphragm seal is to be specified with a separate order number and must be included with 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 mm²
- 13) Only in connection with Ex approval A, B, E or F.
- 14) M12 delivered without cable socket.

Selection and Ordering data		Article No.	Order Code
Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)			
SITRANS P410 with PROFIBUS PA (PA)		7MF4534-	-Z C41
SITRANS P410 with FOUNDATION Fieldbus (FF)		7MF4535-	-Z C41
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Measuring cell filling	Measuring cell cleaning		
Silicone oil	normal	1	
Nominal measuring range			
600 mbar	(240 inH ₂ O)	E	
1600 mbar	(642 inH ₂ O)	F	
5 bar	(2000 inH ₂ O)	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 1/4-18 NPT with flange connection			
<ul style="list-style-type: none"> Sealing screw opposite process connection <ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M12 to DIN 19213 (only for replacement requirement) Venting on side of process flanges, location of vent valve at top of process flanges (see dimensional drawing). <ul style="list-style-type: none"> Mounting thread 7/16-20 UNF to IEC 61518/DIN EN 61518 Mounting thread M12 to DIN 19213 (only for replacement requirement) 		3 1	
		7 5	
Non-wetted parts materials			
Process flange screws	Electronics housing		
Stainless steel	Die-cast aluminum	2	
Stainless steel	Stainless steel precision casting	3	
Version			
<ul style="list-style-type: none"> Standard version, German plate inscription, setting for pressure unit: bar International version, English plate inscription, setting for pressure unit: bar Chinese version, English plate inscription, setting for pressure unit: Pascal All versions include DVD with compact operating instructions in various EU languages.		1 2 3	
Explosion protection			
<ul style="list-style-type: none"> None With ATEX, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety (Ex ia)" "Explosion-proof (Ex d)"⁵⁾ "Intrinsic safety and flameproof enclosure" (Ex ia + Ex d)⁶⁾ "Ex nA/ic (Zone 2)"⁷⁾ "Intrinsic safety, explosion-proof enclosure and dust explosion protection (Ex ia + Ex d + Zone 1D/2D)"⁶⁾⁸⁾ FM + CSA intrinsic safe (is) (pending)⁹⁾ FM + CSA (is + ep) + Ex ia + Ex d (ATEX) + Zone 1D/2D⁶⁾⁷⁾⁹⁾ With FM + CSA, Type of protection: <ul style="list-style-type: none"> "Intrinsic safety and explosion-proof (is + xp)"⁶⁾⁹⁾, max PN 360 			A B D P E R F S NC
Electrical connection/cable entry			
<ul style="list-style-type: none"> Screwed gland M20 x 1.5 Screwed gland 1/2-14 NPT Device plugs M12 (stainless steel)^{10) 11)} 			B C F

Pressure Measurement





Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

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

Included in delivery of the device:

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

- 1) When the manufacture's certificate (calibration certificate) has to be ordered for transmitters with diaphragm seals according to IEC 60770-2, it is recommended only to order this certificate exclusively with the diaphragm seals. The measuring accuracy of the total combination is certified here.
- 2) If the acceptance test certificate 3.1. is ordered for the transmitter with mounted diaphragm seals this certificate must also be ordered with the respective remote seals.
- 3) The diaphragm seal is to be specified with a separate order number and must be included with 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) Without cable gland, with blanking plug.
- 6) With enclosed cable gland Ex ia and blanking plug.
- 7) Configurations with device plugs Han and M12 are only available in Ex ic.
- 8) Only in connection with IP66.
- 9) Explosion protection acc. to FM/CSA: suitable for installations according to NEC 500/505.
- 10) Only in connection with Ex approval A, B, E or F.
- 11) M12 delivered without cable socket

Selection and Ordering data		Order code			
Further designs			HART	PA	FF
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	✓	✓	✓	✓
• FFP (Kalrez, for measured medium temperatures -15 ... 100 °C (5 ... 212 °F))	A22	✓	✓	✓	✓
• NBR (Buna N)	A23	✓	✓	✓	✓
Device plugs¹⁾					
• Han 7D (metal)	A30	✓			
• Han 8D (instead of Han 7D)	A31	✓			
• Angled	A32	✓			
• Han 8D (metal)	A33	✓			
Sealing screws (2 units) 1/4-18 NPT, with valve in mat. of process flanges		A40	✓	✓	✓
Cable sockets for device plugs M12 (metal (CuZn))		A50	✓	✓	✓
Rating plate inscription (instead of German)					
• English	B11	✓	✓	✓	✓
• French	B12	✓	✓	✓	✓
• Spanish	B13	✓	✓	✓	✓
• Italian	B14	✓	✓	✓	✓
English rating plate Pressure units in inH ₂ O and/or psi		B21	✓	✓	✓
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2		C11	✓	✓	✓
Inspection certificate Acc. to EN 10204-3.1		C12	✓	✓	✓
Factory certificate Acc. to EN 10204-2.2		C14	✓	✓	✓
Functional safety (SIL2) (pending) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration		C20	✓		
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511. Includes SIL conformity declaration		C23	✓		
Increased measuring accuracy (mandatory specification for SITRANS P410)		C41	✓	✓	✓
PED for Russia with initial calibration mark		C99	✓	✓	✓
Setting of the upper saturation limit of the output signal to 22.0 mA		D05	✓		
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)		D07	✓	✓	✓
Degree of protection IP66/IP68 (only for M20 x 1.5 and 1/2-14 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			
Further designs			HART	PA	FF
Add "-Z" to Article No. and specify Order code.					
Use in or on zone 1D/2D²⁾ (only together with type of protection "Intrinsic safety" (transmitter 7MF4...-.....-B.. Ex ia) and IP66)		E01	✓	✓	✓
Dual seal		E24	✓	✓	✓
Explosion-proof "Intrinsic safety" to NEPSI (China) (only for transmitter 7MF4...-.....-B..)		E55 ³⁾	✓	✓	✓
Ex prot. "Explosion-proof" to NEPSI (China) (only for transmitter 7MF4...-.....-D..)		E56 ³⁾	✓	✓	✓
Explosion-proof "Zone 2" to NEPSI (China) (only for transmitter 7MF4...-.....-E..)		E57 ³⁾	✓	✓	✓
Ex protection „Ex ia“, „Ex d“ and „Zone 2“ to NEPSI (China) (only for transmitter 7MF4...-.....-R..)		E58 ³⁾	✓	✓	✓
"Intrinsic safety" and "Explosion-proof" explosion protection acc. to Kosha (Korea) (pending) (only for transmitter 7MF4...-.....-[B, D]..-Z + E11)		E70 ³⁾	✓	✓	✓
Ex-protection Ex ia according to EAC Ex (Russia)		E80	✓	✓	✓
Ex-protection Ex d according to EAC Ex (Russia)		E81	✓	✓	✓
Ex-protection Ex nA/ic (Zone 2) according to EAC Ex (Russia)		E82	✓	✓	✓
Ex-protection Ex ia + Ex d + Zone 1D/2D according to EAC Ex (Russia)		E83	✓	✓	✓
Two coats of lacquer on casing and cover (PU on epoxy)		G10	✓	✓	✓
Interchanging of process connection side		H01	✓	✓	✓
Vent on side for gas measurements		H02	✓	✓	✓
Stainless steel process flanges for vertical differential pressure lines		H03	✓	✓	✓
Transient protector 6 kV (lightning protection)		J01	✓	✓	✓
Chambered graphite gasket for process flange		J02	✓	✓	✓
Chambered PTFE graphite gasket		J03	✓	✓	✓
EPDM O-rings for process flange with approval (WRC/WRAS)		J05	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on right when viewing the display)⁴⁾		J08	✓	✓	✓
Vent valve or blanking plug of process flange welded-in (orientation: on left when viewing the display)⁴⁾		J09	✓	✓	✓
Marine approvals					
• Det Norske Veritas Germanischer Lloyd (DNV-GL)	S10	✓	✓	✓	✓
• Lloyds Register (LR)	S11	✓	✓	✓	✓
• French marine classification society Bureau Veritas (BV)	S12	✓	✓	✓	✓
• American Bureau of Shipping (ABS)	S14	✓	✓	✓	✓
• Russian Maritime Register (RMR)	S16	✓	✓	✓	✓
• Korean Register of Shipping (KR)	S17	✓	✓	✓	✓

Factor valve block mounting for SITRANS P410 is possible. Depending on the available P410 variants, please see the configuration options for SITRANS P DS III (page 1/254).

1) Device plug Han IP65

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

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

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow

1

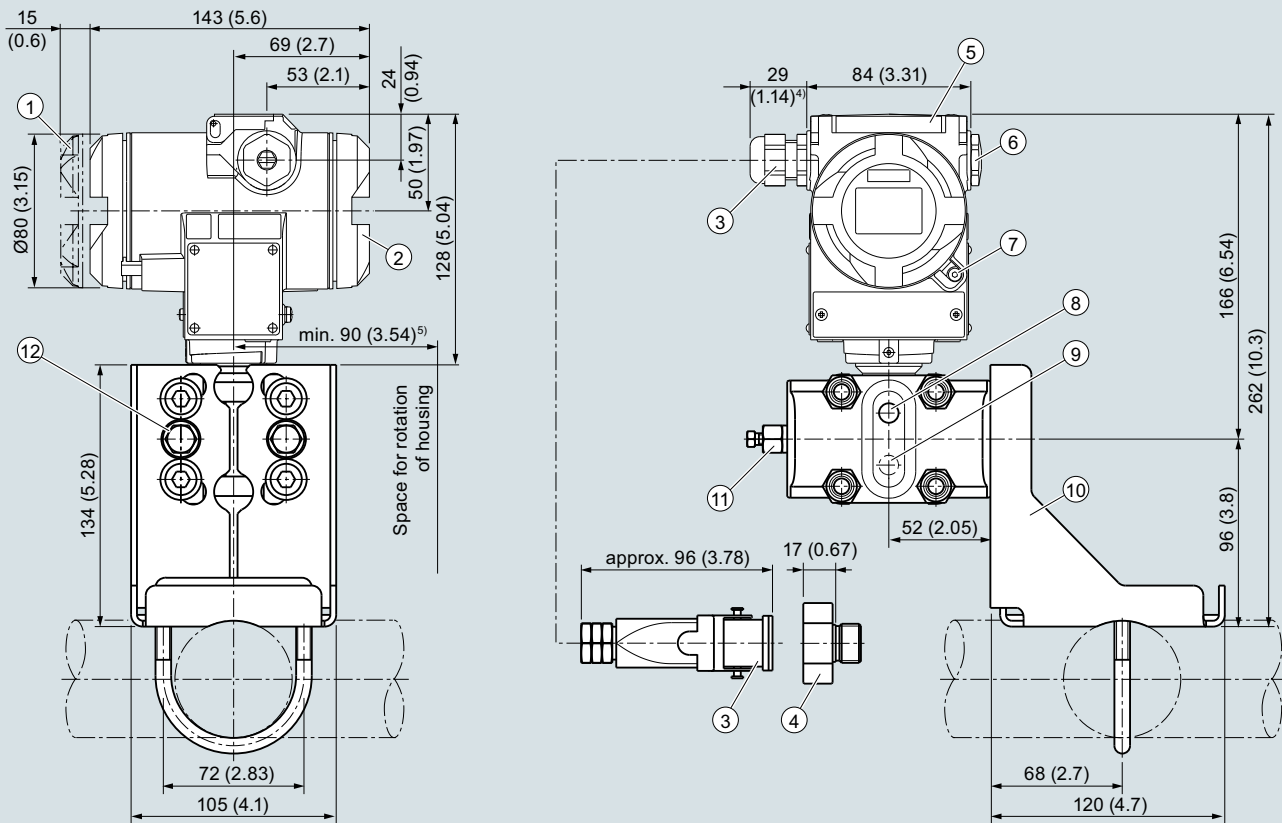
Selection and Ordering data	Order code			
Additional data		HART	PA	FF
Please add "-Z" to Article No. and specify Order code(s) and plain text.				
Measuring range to be set Specify in plain text: • in the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi • in the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi	Y01 Y02	✓ ✓	✓ 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 ₂ O [*] , inH ₂ O [*] , ftH ₂ O [*] , 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 units²⁾ 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 side¹⁾
- 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)

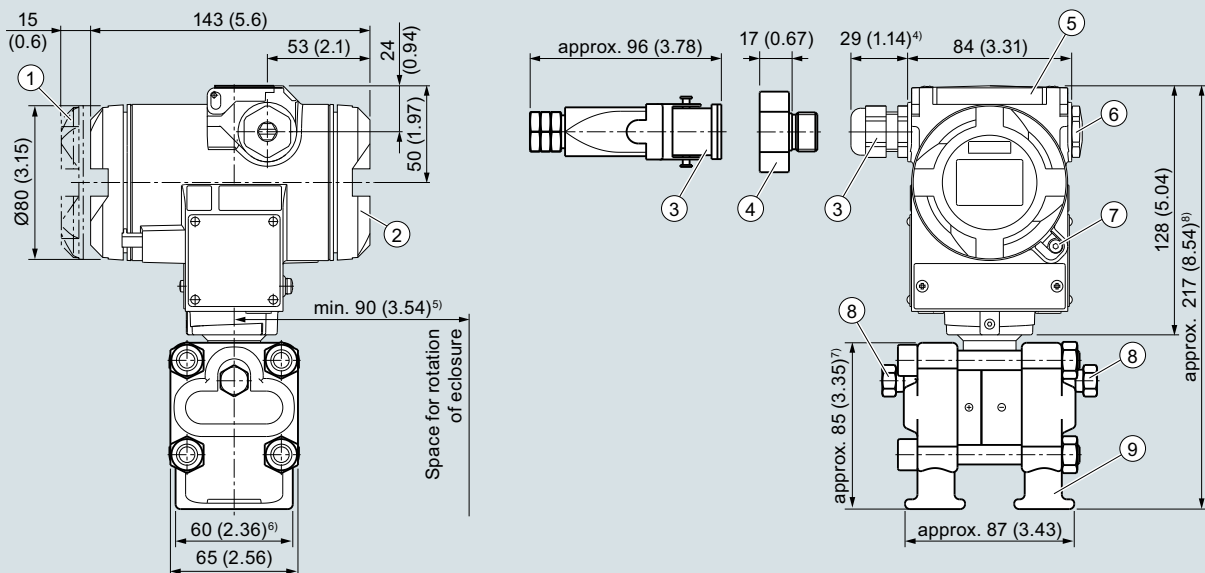
Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

for differential pressure and flow



- ① Electronics side, local display (longer overall length for cover with inspection window)¹⁾
- ② Connection side¹⁾
- 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 8D²⁾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 + XPI]
- ⁴⁾ For Pg 13.5 with adapter, approx. 45 mm (1.77 inch)
- ⁵⁾ 92 mm (3.62 inch) minimum distance for rotating with indicator
- ⁶⁾ 74 mm (2.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
- ⁷⁾ 91 mm (3.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)
- ⁸⁾ 219 mm (8.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

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



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

Selection and Ordering data	Article No.	Selection and Ordering data	Article No.
Accessories/Spare parts		Mounting screws	
Mounting bracket and fastening parts for pressure transmitters SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF403-.....C.)		For measuring point label, grounding and connection terminals or for display (50 units)	7MF4997-1CD
<ul style="list-style-type: none"> made of steel made of stainless steel 304/1.4301 made of stainless steel 316L/1.4404 	7MF4997-1AB 7MF4997-1AH 7MF4997-1AP	Sealing screws (1 set = 2 units) for process flange	
		<ul style="list-style-type: none"> made of stainless steel made of Hastelloy 	7MF4997-1CG 7MF4997-1CH
Mounting bracket and fastening parts for pressure transmitters SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus (7MF403-.....A., ..B., ..D. and ..F.)		Sealing screws with vent valve Complete (1 set = 2 units)	
<ul style="list-style-type: none"> made of steel made of stainless steel 304/1.4301 made of stainless steel 316L/1.4404 	7MF4997-1AC 7MF4997-1AJ 7MF4997-1AQ	<ul style="list-style-type: none"> made of stainless steel made of Hastelloy 	7MF4997-1CP 7MF4997-1CQ
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-....)		Connection board	
<ul style="list-style-type: none"> made of steel made of stainless steel 304/1.4301 made of stainless steel 316L/1.4404 	7MF4997-1AD 7MF4997-1AK 7MF4997-1AR	<ul style="list-style-type: none"> for SITRANS P410 for SITRANS P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus 	7MF4997-1DN 7MF4997-1DP
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-....)		O-rings for process flanges made of:	
<ul style="list-style-type: none"> made of steel made of stainless steel 304/1.4301 made of stainless steel 316L/1.4404 	7MF4997-1AE 7MF4997-1AL 7MF4997-1AS	<ul style="list-style-type: none"> FPM (Viton) PTFE (Teflon) FEP (with silicone core, approved for food) FFPM (Kalrez) NBR (Buna N) 	7MF4997-2DA 7MF4997-2DB 7MF4997-2DC 7MF4997-2DD 7MF4997-2DE
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-....)		Sealing ring for process connection	see "Fittings"
<ul style="list-style-type: none"> made of steel made of stainless steel 304/1.4301 made of stainless steel 316L/1.4404 	7MF4997-1AF 7MF4997-1AM 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			
<ul style="list-style-type: none"> without window with window 	7MF4997-1BB 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			
<ul style="list-style-type: none"> without window with window 	7MF4997-1BC 7MF4997-1BF 7MF4997-1BR		
Digital indicator Including mounting material, for SITRANS P410 with HART, P410 with PROFIBUS PA and P410 with FOUNDATION Fieldbus			
Measuring point label			
<ul style="list-style-type: none"> without inscription (5 units) Printed (1 unit) Data according to Y01 or Y02, Y15, Y16 and Y99 (see "Pressure transmitters") 	7MF4997-1CA 7MF4997-1CB-Z Y..:		

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P410

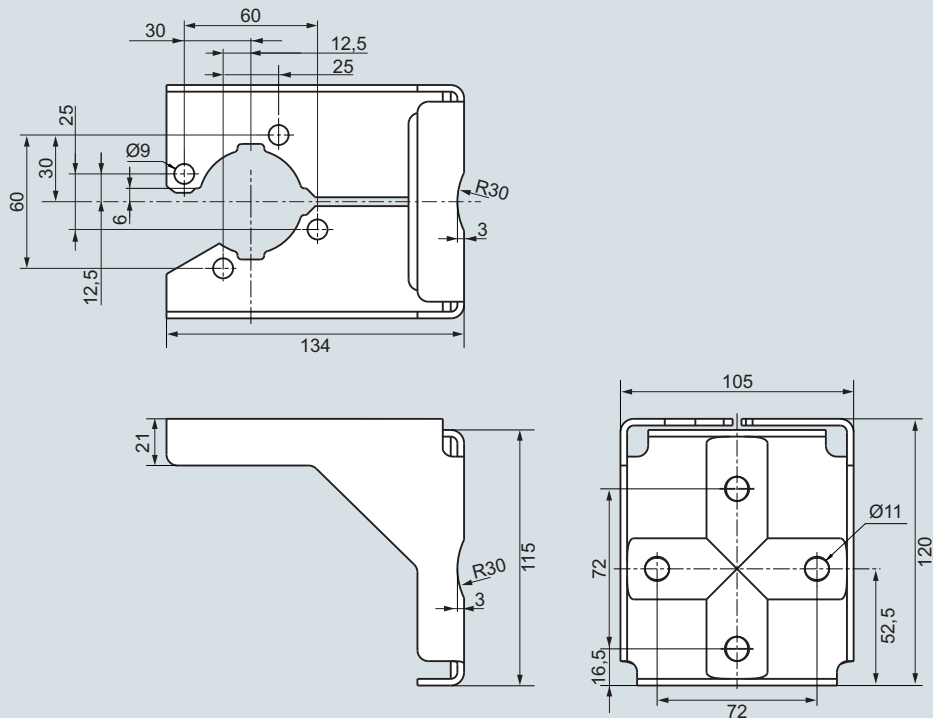
Accessories/Spare parts

1

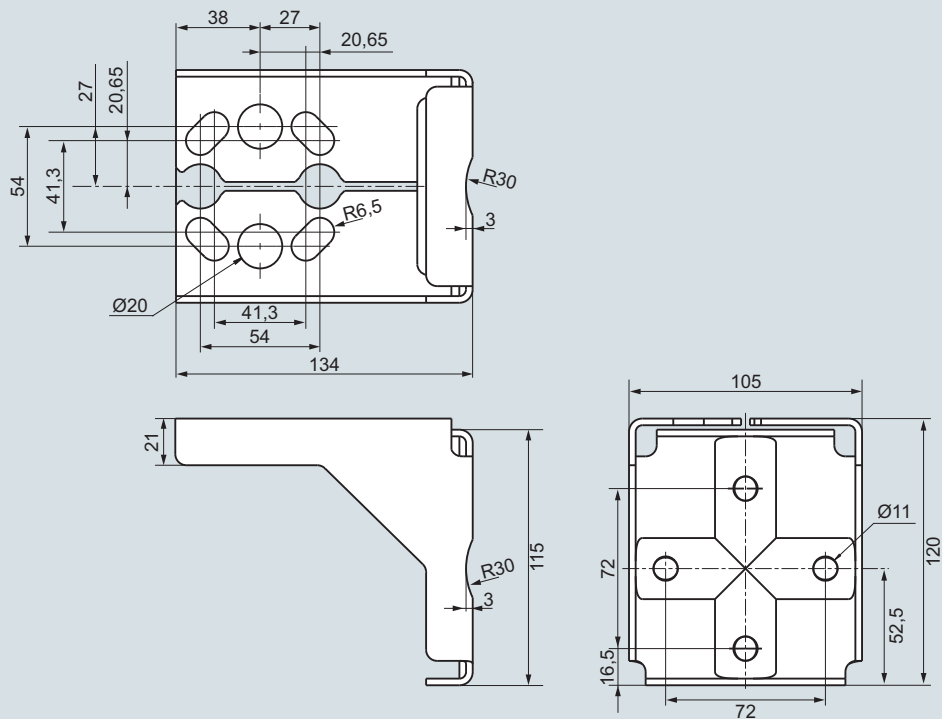
Selection and Ordering data	Article No.
Documentation The entire documentation is available for download free-of-charge in various languages at: http://www.siemens.com/processinstrumentation/documentation Compact operating instructions SITRANS P DS III/P410 • English, German, Spanish, French, Italian,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

Pressure Measurement

Pressure transmitters
for applications with highest requirements (Premium)
SITRANS P500

Technical description

Overview



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

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

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

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

The SITRANS P500 pressure transmitters can be configured to measure:

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

Benefits

- High measuring accuracy
- Very fast response time
- Extremely good long-term stability
- High reliability even under extreme chemical and mechanical loads
- For aggressive and non-aggressive gases, vapors and liquids
- Extensive diagnosis and simulation functions which can be used both on site as well as via HART.
- Optional separate replacement of measuring cell and electronics without recalibration.
- Extremely low conformity error values

- Infinitely adjustable spans of 1 mbar to 32 bar (0.0145 to 465 psi; 0.4 to 12860 inH₂O)
- Extremely good total performance and conformity error values with no loss of performance up to a turndown of 10 guaranteed.
- Additional integrated sensor for static pressure
- Parameterization via on-site control keys or HART
- Short process flanges nable space-saving installation.

Application

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

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

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

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

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

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

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 element (see Chapter "Flow Meters"))
- Span (freely adjustable)
for SITRANS P500: 1 mbar to 32 bar (0.0145 to 465 psi; 0.4 to 12860 inH₂O)

Pressure transmitters for level

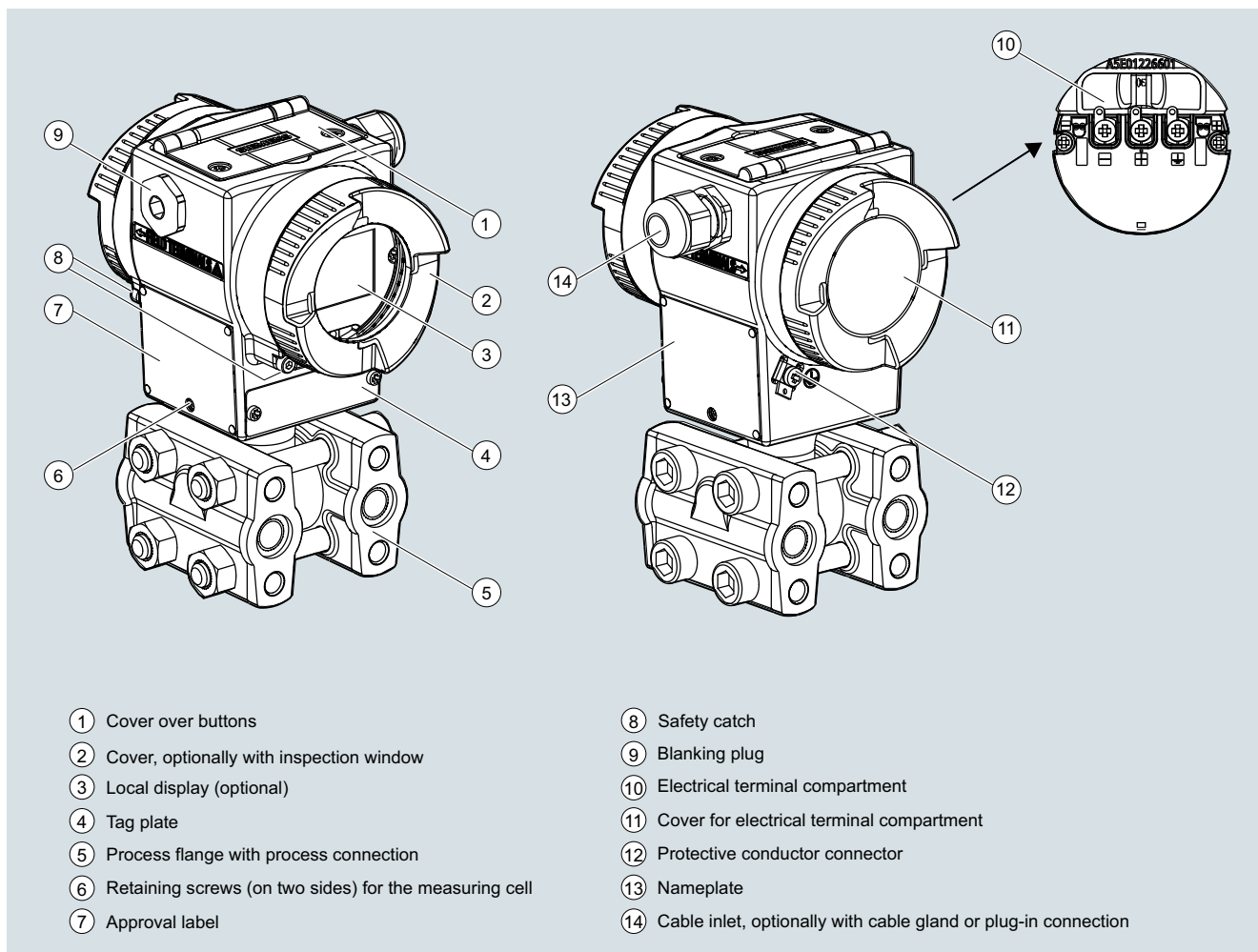
- Measured variable: Level of aggressive and non-aggressive liquids in open and closed vessels.
- Span (freely adjustable)
for SITRANS P500: 1.25 to 6250 mbar (0.5 to 2509 inH₂O)

- 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**View of transmitter**

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

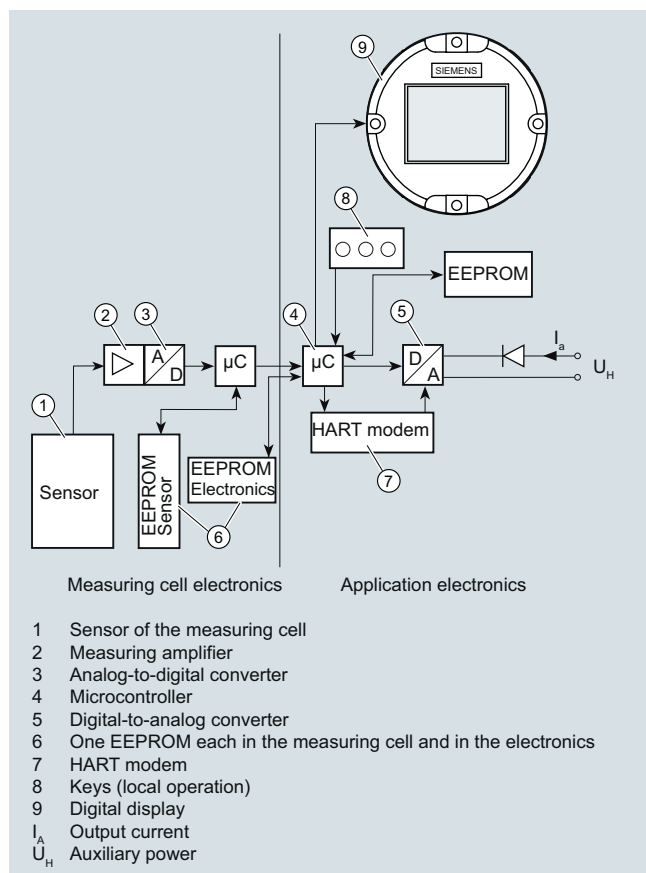
Pressure Measurement

Pressure transmitters
for applications with highest requirements (Premium)
SITRANS P500

Technical description

Function

Operation of electronics with HART communication



Function diagram of electronics

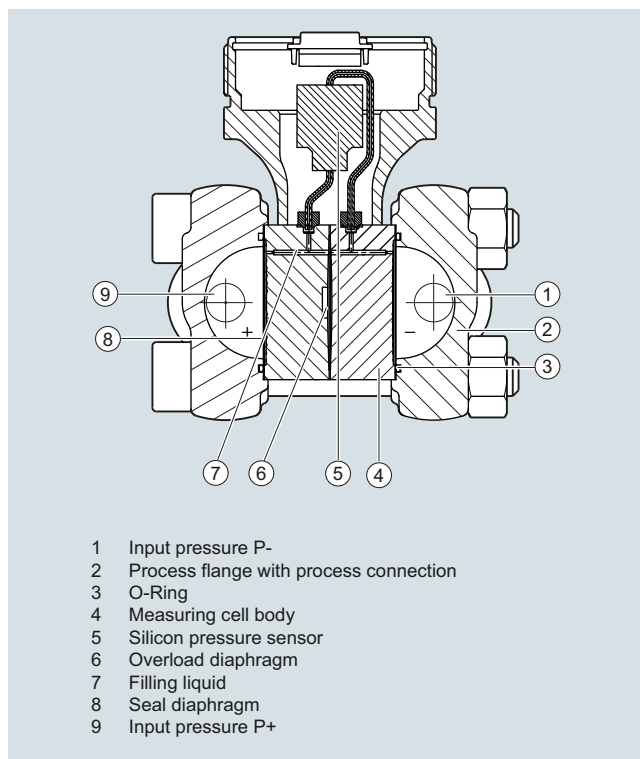
- The input pressure is converted into an electrical signal by the sensor.
- This signal is amplified by the measuring amplifier and digitized in an analog-to-digital converter.
- The digital signal is analyzed in a microcontroller and corrected according to linearity and thermal characteristics.
- In 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.

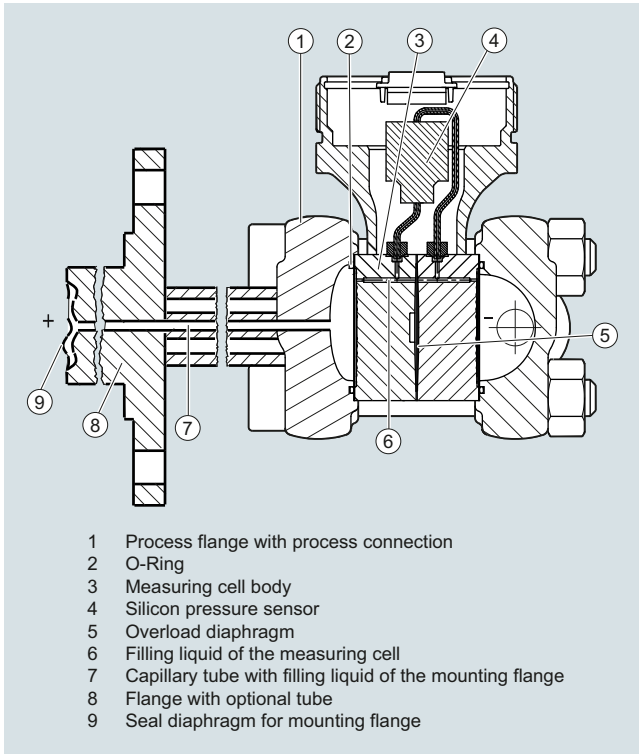
Mode of operation of the measuring cells

Measuring cell for differential pressure and flow



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.

Measuring cell for level

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.

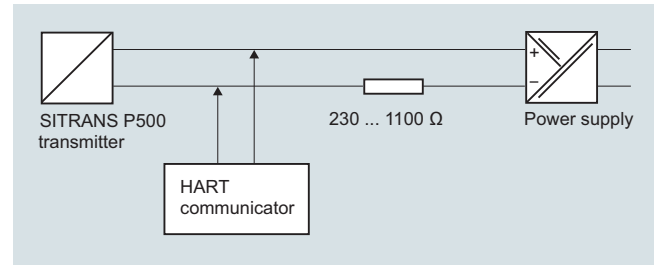
Configuration using the pushbuttons (local operation)

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.

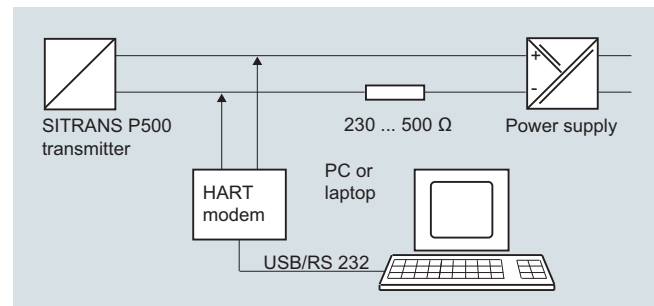
Configuration using HART

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

Pressure Measurement

Pressure transmitters

for applications with highest requirements (Premium)

SITRANS P500

Technical description

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 ₂ O (4 °C), inH ₂ O (4 °C), inH ₂ O (20 °C), mmH ₂ O, mmH ₂ O (4 °C), ftH ₂ O (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		Measuring accuracy	
Measured variable	Differential pressure and flow		<div>Reference conditions (in accordance with IEC 60770-1)</div> <div>All error information always refers to the set span.</div> <div>Error in measurement at limit setting incl. hysteresis and reproducibility</div> <div>r: Span ratio (r: Span ratio (r = max. span / set span))</div> <div>Linear characteristic</div> <div>• 50 mbar (20 inH₂O)</div> <div>• 250 mbar (100 inH₂O)</div> <div>1250 mbar (502 inH₂O)</div> <div>6250 mbar (2509 inH₂O)</div> <div>32 bar (465 psi)</div> <div>Square-rooted characteristic</div> <div>• Flow > 50 %</div> <div>- 50 mbar (20 inH₂O)</div> <div>- 250 mbar (100 inH₂O)</div> <div>1250 mbar (502 inH₂O)</div> <div>6250 mbar (2509 inH₂O)</div> <div>32 bar (465 psi)</div> <div>• Flow 25 % ... 50 %</div> <div>- 50 mbar (20 inH₂O)</div> <div>- 250 mbar (100 inH₂O)</div> <div>1250 mbar (502 inH₂O)</div> <div>6250 mbar (2509 inH₂O)</div> <div>32 bar (465 psi)</div> <div>Influence of ambient temperature per 28 °C (50 °F)</div> <div>• 50 mbar (20 inH₂O)</div> <div>• 250 mbar (100 inH₂O)</div> <div>• 1250 mbar (502 inH₂O)</div> <div>6250 mbar (2509 inH₂O)</div> <div>32 bar (465 psi)</div> <div>Influence of static pressure</div> <div>• At the start of scale value (PKN)</div> <div>- 50 mbar (20 inH₂O)</div> <div>- 250 mbar (100 inH₂O)</div> <div>- 1250 mbar (502 inH₂O)</div> <div>6250 mbar (2509 inH₂O)</div> <div>32 bar (465 psi)</div> <div>• On the span (PKS)</div> <div>- 50 mbar (20 inH₂O)</div> <div>- 250 mbar (100 inH₂O)</div> <div>1250 mbar (502 inH₂O)</div> <div>- 6250 mbar (2509 inH₂O)</div> <div>- 32 bar (465 psi)</div>
Span (infinitely adjustable)	<div>Span (min. ... max.)</div> <div>Maximum operating pressure (static pressure)</div>		
	<div>1.00 ... 50 mbar (0.4 ... 20 inH₂O)</div> <div>1.25 ... 250 mbar (0.5 ... 100 inH₂O)</div> <div>6.25 ... 1250 mbar (2.5 ... 502 inH₂O)</div> <div>31.25 ... 6250 mbar (12.54 ... 2509 inH₂O)</div> <div>0.16 ... 32 bar (2.33 ... 465 psi)</div>	160 bar (2320 psi)	
Lower range limit			
• Measuring cell with silicone oil filling	-100 % of max. span and/or 30 mbar a (0.44 psi a)		
Upper range limit	100 % of max. span		
Start of scale	Between measuring limits (freely adjustable)		
Output			
Output current signal	4 ... 20 mA		
• Lower current limit (freely adjustable)	3.55 mA, factory setting 3.8 mA		
• Upper current limit (freely adjustable)	23 mA, factory setting 20.5 mA		
• Ripple (without HART communication)	I _{pp} ≤ 0.4 % of max. output current		
• adjustable damping	0... 100 s in steps of 0.1 s, factory-setting: 2 s		
• current transmitter	3.55 ... 23 mA		
• Failure signal	<div>adjustable within limits::</div> <div>• Bottom: 3.55 ... 3.7 mA (default value: 3.6 mA)</div> <div>• Top: 21.0 ... 23 mA (default value: 22.8 mA)</div>		
Load			
• Without HART communication	$R_B \leq (U_H - 10.5 \text{ V})/0.023 \text{ A in } \Omega$ U_H : Power supply in V		
• With HART communication			
- HART Communicator	$R_B = 230 \dots 1100 \Omega$		
- HART modem	$R_B = 230 \dots 500 \Omega$		
Characteristic curve	Linearly rising, linearly falling, square rooted characteristic rising, bidirectional square rooted characteristic and user-specific		

Pressure Measurement

Pressure transmitters

for applications with highest requirements (Premium)

SITRANS P500

for differential pressure and flow

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Total Performance¹⁾			Design	
• Linear characteristic	$r \leq 5$	$5 < r \leq 10$	Weight (without options)	Approx. 3.3 kg (7.3 lb)
- 50 mbar (20 inH ₂ O)	$\leq 0.27 \%$	$\leq 0.46 \%$	Material of parts in contact with the medium	
- 250 mbar (100 inH ₂ O)	$\leq 0.14 \%$	$\leq 0.27 \%$	• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Hastelloy C276, Monel 400
- 1250 mbar (502 inH ₂ O)	$\leq 0.09 \%$	$\leq 0.14 \%$	• Process connection and sealing screw	PN 160: stainless steel, mat.-No. 1.4404/316L
6250 mbar (2509 inH ₂ O)			• Sealing material in the process connections	
32 bar (465 psi)			- O-Ring	• Standard: Viton (FKM (FPM))
Square rooted characteristic				• Optional: NBR
• Flow > 50 %	$r \leq 5$	$5 < r \leq 10$		PTFE (virginal)
- 50 mbar (20 inH ₂ O)	$\leq 0.27 \%$	$\leq 0.46 \%$		PTFE (glass fiber-reinforced)
- 250 mbar (100 inH ₂ O)	$\leq 0.14 \%$	$\leq 0.27 \%$		FFPM (Kalrez) ²⁾
- 1250 mbar (502 inH ₂ O)	$\leq 0.09 \%$	$\leq 0.14 \%$		Graphite
6250 mbar (2509 inH ₂ O)				
32 bar (465 psi)				
• Flow 25 % ... 50 %	$r \leq 5$	$5 < r \leq 10$		
- 50 mbar (20 inH ₂ O)	$\leq 0.54 \%$	$\leq 0.92 \%$	Material of parts not in contact with media	
- 250 mbar (100 inH ₂ O)	$\leq 0.28 \%$	$\leq 0.54 \%$	Die-cast aluminum housing	• Low copper die-cast aluminum AC-AlSi12 (Fe) or AC-AlSi 10 Mg (Fe) to DIN EN 1706
- 1250 mbar (502 inH ₂ O)	$\leq 0.18 \%$	$\leq 0.28 \%$		• Lacquer on polyurethane base, optional epoxy-based primer
6250 mbar (2509 inH ₂ O)				• Stainless steel name plates (mat. no. 1.4404/316L)
32 bar (465 psi)				
Step response time T_{63} without electrical damping			Stainless steel precision cast housing	Stainless steel, mat. no. 1.4404/316L
• 50 mbar (20 inH ₂ O)	≤ 140 ms, contains a dead time of ≤ 45 ms		Process connection screws	Stainless steel, mat. no. 1.4404/316L
• 250 mbar (100 inH ₂ O)	≤ 88 ms, contains a dead time of ≤ 45 ms		Mounting bracket	Steel or stainless steel mat. no. 1.4301
1250 mbar (502 inH ₂ O)				
6250 mbar (2509 inH ₂ O)			Measuring cell filling	Silicone oil
32 bar (465 psi)			Process connection	1/4-18 NPT female thread and flange connection with M10 to DIN 19213 or 7/16-20 UNF mounting thread to IEC 61518/DIN EN 61518
Long-term stability	$\leq (0.05 \cdot r) \%$ per 5 years			
	$\leq (0.08 \cdot r) \%$ per 10 years		Electrical connection	• Screw terminals
Influence of power supply	$\leq 0.005 \%$ /1 V			• Cable entry via the following screwed glands:
Rated conditions				- M20 x 1.5
Mounting position	Any			- 1/2-14 NPT
Ambient conditions				- Device plug Han 7D/Han 8D
• Ambient temperature (Note: Observe the temperature class in areas subject to explosion hazard.)				- Device plug M12
- Total device	-40 ... +85 °C (-40 ... +185 °F)		Displays and controls	
- Readable display	-20 ... +85 °C (-4 ... +185 °F)		Pushbuttons	3 for local programming directly on transmitter
- Storage temperature	-50 ... +90 °C (-58 ... +194 °F)		Display	• With or without integrated display
Climatic class				• Cover with or without window
• Condensation	Relative humidity 0 ... 100 % (condensation permissible)			
Degree of protection (to IEC 60529)	IP66/IP 68 and NEMA 4X (with corresponding cable gland)		Auxiliary power supply	
Electromagnetic Compatibility			Terminal voltage on transmitter	• DC 10.6 ... 44 V
• Emitted interference and interference immunity	Acc. to IEC 61326 and NAMUR NE 21			• With intrinsically-safe operation DC 10.6 ... 30 V
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)			

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"
 - Marking PTB 09 ATEX 2004 X
 - Permissible ambient temperature Ex II 1/2 G Ex ia/ib IIC T4
-40 ... +85 °C (-40 ... +185 °F)
 - Connection To certified intrinsically-safe circuits
with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$;
 $R_i = 300 \Omega$
 $L_i = 400 \mu\text{H}$
 - Effective internal inductance: $C_i = 6 \text{ nF}$
 - Effective inner capacitance: $C_i = 6 \text{ nF}$
- Explosion-proof "d"
 - Marking BVS 09 ATEX E 027
 - Permissible ambient temperature Ex II 1/2 G Ex db ia IIC T4/T6 Ga/Gb
-40 ... +85 °C (-40 ... +185 °F)
temperature class T4;
-40 ... +60 °C (-40 ... +140 °F)
temperature class T6
 - Connection To circuits with values:
 $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
- Dust explosion protection for zone 20
 - Marking BVS 09 ATEX E 027
 - Permissible ambient temperature Ex II 1 D Ex ta ia IIC T120°C Da
-40 ... +85 °C (-40 ... +185 °F)
 - Max. surface temperature 120 °C (248 °F)
 - Connection To certified intrinsically-safe circuits
with peak values:
 $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$
 $L_i = 400 \mu\text{H}$
 - Effective internal inductance: $C_i = 6 \text{ nF}$
 - Effective inner capacitance: $C_i = 6 \text{ nF}$
- Dust explosion protection for zone 21/22
 - Marking BVS 09 ATEX E 027
 - Connection Ex II 2D Ex tb ia IIC T120°C Db
To circuits with values:
 $U_m = 10.5 \dots 45 \text{ V DC}$; $P_{\text{max}} = 1.2 \text{ W}$
- Type of protection "n" (zone 2)
 - Marking PTB 09 ATEX 2004 X
 - "nA" connection Ex II 3 G Ex nA II T4/T6
 - "nL, ic" connection Ex II 2/3 G Ex ib/nL IIC T4/T6
 - Effective internal inductance: Ex II 2/3 G Ex ib/ic IIC T4/T6
 $U_m = 45 \text{ V DC}$
 - Effective inner capacitance: $U_i = 45 \text{ V}$
 $L_i = 400 \mu\text{H}$
 $C_i = 6 \text{ nF}$

Explosion protection for USA
(to FM)

Certificate of Compliance

- Identification (XP/DIP) or (IS)

- Permissible Ambient Temperature

- Entity parameters

- Marking (NI/NO)

- Permissible Ambient Temperature

- (NI/S) parameters

Explosion protection for
Canada (to cCSA US)

Certificate of Compliance

- Marking (XP/DIP)

- Permissible ambient temperature

- Entity parameters

- Marking (ia/ib)

- Permissible ambient temperature

- Entity parameters

- Marking (NI/n)

- Permissible ambient temperature

- NI/nA parameters

- nL parameters

No. 3033013

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

$T_a = \text{T4: } -40 \dots +85 \text{ °C}$
 $(-40 \dots +185 \text{ °F})$
 $T_a = \text{T6: } -40 \dots +60 \text{ °C}$
 $(-40 \dots +140 \text{ °F})$

According to "control drawing":
A5E02189134N

$U_m = 30 \text{ V}$, $I_m = 100 \text{ mA}$,
 $P_i = 750 \text{ mW}$, $L_i = 400 \mu\text{H}$, $C_i = 6 \text{ nF}$

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

$T_a = \text{T4: } -40 \dots +85 \text{ °C}$
 $(-40 \dots +185 \text{ °F})$
 $T_a = \text{T6: } -40 \dots +60 \text{ °C}$
 $(-40 \dots +140 \text{ °F})$

According to "control drawing":
A5E02189134N

$U_m = 45 \text{ V}$, $L_i = 400 \mu\text{H}$, $C_i = 6 \text{ nF}$

No. 2280963

CL I, DIV 1, GP ABCD T4 /T6;
CL II, DIV 1, GP EFG T4/T6

$T_a = \text{T4: } -40 \dots +85 \text{ °C } (-40 \dots +185 \text{ °F})$
 $T_a = \text{T6: } -40 \dots +60 \text{ °C } (-40 \dots +140 \text{ °F})$

According to "control drawing":
A5E02189134N
 $U_m = 45 \text{ V}$

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

$T_a = \text{T4: } -40 \dots +85 \text{ °C}$
 $(-40 \dots +185 \text{ °F})$

$U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$,
 $R_i = 300 \Omega$, $L_i = 400 \mu\text{H}$, $C_i = 6 \text{ nF}$

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

$T_a = \text{T4: } -40 \dots +85 \text{ °C } (-40 \dots +185 \text{ °F})$
 $T_a = \text{T6: } -40 \dots +60 \text{ °C } (-40 \dots +140 \text{ °F})$

According to "control drawing":
A5E02189134N
 $U_m = 45 \text{ V}$

According to "control drawing":
A5E02189134N
 $U_i = 45 \text{ V}$, $I_i = 100 \text{ mA}$, $L_i = 400 \mu\text{H}$,
 $C_i = 6 \text{ nF}$

Pressure Measurement

Pressure transmitters

for applications with highest requirements (Premium)

SITRANS P500

for differential pressure and flow

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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: $U_i = 30 \text{ V}$ $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$
- Effective internal inductance	$L_i = 400 \text{ mH}$
- Effective inner capacitance	$C_i = 6 \text{ nF}$
• 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: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
• Dust explosion protection for zone 21/22	GYJ111112
- Marking	DIP A21 TA,T120 °C IP68 D21
- Connection	To circuits with values: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
• Type of protection "n" (zone 2)	GYJ111111X
- Marking	Ex nL IIB/IIC T4/T6 Ex nA II T4/T6
- Connection	$U_i = 45 \text{ V DC}$
- Effective internal inductance	$L_i = 400 \text{ mH}$
- Effective inner capacitance	$C_i = 6 \text{ nF}$

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 with span "G".

HART communication

Load with connection of	
• HART communicator	$R_B = 230 \dots 1100 \Omega$
• HART modem	$R_B = 230 \dots 500 \Omega$
Cable	2 wire shielded: $\leq 3.0 \text{ km}$ (1.86 miles), multiwire shielded: $\leq 1.5 \text{ km}$ (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.

**Pressure transmitters for differential pressure and flow,
SITRANS P500 HART, PN 160 (MAWP 2320 psi)****7MF54-00**

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

Enclosure**Thread for cable gland¹⁾**

Die-cast aluminum, dual compartment

M20x1.5

Die-cast aluminum, dual compartment

½-14 NPT

Stainless steel precision casting, two-chamber housing

M20x1.5

Stainless steel precision casting, two-chamber housing

½-14 NPT

Output

4 ... 20 mA, HART

Measuring cell filling**Measuring cell cleaning**

Silicone oil

normal

Measuring span1.00 ... 50 mbar (0.4 ... 20 inH₂O)1.25 ... 250 mbar (0.5 ... 100.4 inH₂O)6.25 ... 1250 mbar (2.5 ... 502 inH₂O)31.25 ... 6250 mbar (12.54 ... 2509 inH₂O)

0.16 ... 32 bar (2.33 ... 465 psi)

Wetted parts materials

Seal diaphragm

Process flange

Stainless steel 1.4404/316L

Stainless steel 1.4404/316L

Hastelloy C276²⁾

Stainless steel 1.4404/316L

Monel 400²⁾

Stainless steel 1.4404/316L

Hastelloy

Hastelloy

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
- Mounting thread M10 to DIN 19213

• Vent on side of process flange³⁾

- Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518
- Mounting thread M10 to DIN 19213

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).

Pressure Measurement

Pressure transmitters

for applications with highest requirements (Premium)

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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 casing / cover version

Two coats of lacquer on casing, cover (PU on epoxy) **A20**

Electrical connection and cable entry

(Standard: no cable gland, only dust protection caps)

Cable gland made of plastic (IP66/68)⁴⁾ **A50**

Cable glands made of metal (IP66/68) **A51**

Cable glands made of stainless steel (IP66/68) **A52**

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 adapters⁴⁾ **A82**

Language for labels, quick-start guide, menu language default⁹⁾

(instead of English as standard)

German **B10**

French **B12**

Spanish **B13**

Italian **B14**

Chinese **B15**

Russian **B16**

Japanese **B17**

English with units psi/inH₂O/°F **B21**

Special version: Supplementary menu languages

(Standard: English, German, French, Spanish, Italian)

Asia language package (in addition: Chinese, Japanese, Russian) **B80**

Certificates

(available online for downloading)¹⁾

Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2²⁾ **C11**

Acceptance test certificate according to EN 10204-3.1³⁾ **C12**

Acceptance 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 (cCSA_{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 (cCSA_{US})(T4/T6) **E22**

Ex d explosion-proof (NEPSI)(T4/T6) **E26**

Degree of protection approvals: n/Nl

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 (cCSA_{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 (cCSA_{US}) **E72**

IS protection and XP and DIP (FM/cCSA_{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 approval⁵⁾ **E85**

Export approval Korea **E86**

Special process connection versions (diff. pressure)

Side vents for gas measurements⁹⁾ **L32**

Swap process connection: high-pressure side at front **L33**

Mosquito protection

4 pcs. for 1/4-18 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 1/4- 18 NPT, in material of process flanges) **L80**

Remote seals

Transmitters with connection of remote seal⁶⁾ (For premounted valve manifolds see page 1/322) **V00**

¹⁾ Enclosed in print or as DVD: see page 1/320.

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

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

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

⁵⁾ Only in conjunction with FM and/or cCSA_{US}

⁶⁾ Please select a remote seal separately. Also refer to the information under footnote 2). Remote seals see page 1/402.

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".

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:	
<ul style="list-style-type: none"> In the case of linear characteristic curve (max. 5 characters): Y01: ... up to ... mbar, bar, kPa, MPa, psi 	Y01
<ul style="list-style-type: none"> In the case of square rooted characteristic (max. 5 characters): Y02: ... up to ... mbar, bar, kPa, MPa, psi 	Y02
Measuring point number and measuring point identifier (only standard ASCII character set) Specify in plain text:	
Measuring point number (TAG No.), max. 16 characters Y15:	Y15
Measuring point text (max. 27 char.) Y16:	Y16
Entry of HART address (TAG), max. 32 characters Y17:	Y17
Setting of pressure indication in pressure units	Y21
Specify in plain text (standard setting: mbar) Y21: bar, kPa, MPa, psi, ... Note: The following pressure units are selectable: bar, mbar, mm H ₂ O*, in H ₂ O*, ftH ₂ O*, 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 units¹⁾ Specify in plain text:	Y22 + Y01 or Y02
Y22: ... up to ... l/min, m ³ /h, m, USgpm, ... (specification of measuring range in pressure units "Y01" is essential, unit with max. 5 characters)	
Customer-specific settings	
Damping setting (range: 0 ... 100 s) (Standard setting: 2 s)	Y30

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

Pressure Measurement

Pressure transmitters

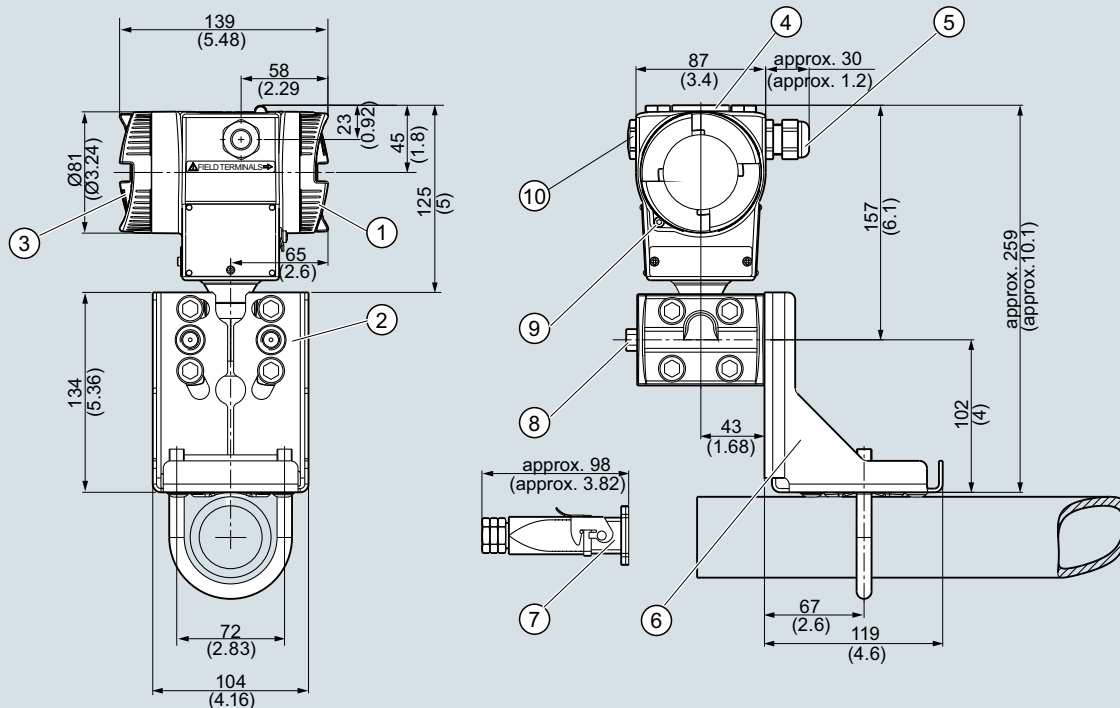
for applications with highest requirements (Premium)

SITRANS P500

for differential pressure and flow

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Dimensional drawings



① Connection side¹⁾

② Process connection: 1/4-18 NPT (IEC 61518)

③ Electronics side, local display¹⁾

④ Cover over buttons

⑤ Electrical connection:

- M20 x 1,5 or 1/2-14 NPT screw gland
- Han 7D/Han 8D^{2) 3)} or M12³⁾ 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			Long-term stability	≤ (0.05 · r) % per 5 years ≤ (0.08 · r) % per 10 years
Measured variable	Level			
Span (infinitely adjustable)	Span (min. ... max.)	Maximum operating pressure	Influence of ambient temperature per 28 °C (50 °F) ¹⁾	
	1.25 ... 250 mbar (0.5 ... 100 inH ₂ O)	See "Mounting flange"	• 250 mbar (100 inH ₂ O)	≤ (0.025 · r + 0.014) %
	6.25 ... 1250 mbar (2.5 ... 500 inH ₂ O)		• 1250 mbar (502 inH ₂ O) 6250 mbar (2509 inH ₂ O)	≤ (0.006 · r + 0.03) %
	31.25 ... 6250 mbar (12.54 ... 2509 inH ₂ O)		Influence of static pressure	
Lower range limit			• At the start of scale value (PKN) ^{1) 2)}	
• Measuring cell with silicone oil filling	-100 % of max. 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)		- 250 mbar (100 inH ₂ O)	≤ (0.035 · r) % je 70 bar (1015 psi) correction via zero point correction
Upper range limit	100% of max. span		- 1250 mbar (502 inH ₂ O) 6250 mbar (2509 inH ₂ O)	≤ (0.007 · r) % je 70 bar (1015 psi) correction via zero point correction
Start of scale	Between measuring limits (freely adjustable)		• On the span (PKS) ¹⁾	
			- 250 mbar (100 inH ₂ O) 1250 mbar (502 inH ₂ O)	≤ 0.03 % je 70 bar (1015 psi)
			- 6250 mbar (2509 inH ₂ O)	≤ 0.09 % je 70 bar (1015 psi)
			Influence of power supply	≤ 0.005 %/1 V
Output			Rated conditions	
Output current signal	4 ... 20 mA		Mounting position	Defined by flange
• Lower current limit (freely adjustable)	3.55 mA, factory setting 3.8 mA		Ambient conditions	
• Upper current limit (freely adjustable)	23 mA, factory setting 20.5 mA		• Ambient temperature (Note: Observe the temperature class in areas subject to explosion hazard.)	
• Ripple (without HART communication)	I _{pp} ≤ 0.4 of max. output current		- total device	-40 ... +85 °C (-40 ... +185 °F)
• adjustable damping	0... 100 s in steps of 0.1 s, factory setting 2 s		- Readable display	-20 ... +85 °C (-4 ... +185 °F)
• current transmitter	3.55 ... 23 mA		- Storage temperature	-50 ... +90 °C (-58 ... +194 °F)
• 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)		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} ≥ 1 bar	-40 ... +175 ³⁾ °C (-40 ... +347 ³⁾ °F)
			- p _{abs} < 1 bar	-40 ... +80 °C (-40 ... +176 °F)
Measuring accuracy			Design	
Reference conditions (in accordance with IEC 60770-1)	• Rising characteristic curve • Start of scale 0 bar • Stainless steel seal diaphragm • Measuring cell with silicone oil filling • Room temperature (25 °C (77 °F))		Weight	
All error information always refers to the set span.			• To EN (pressure transmitter with mounting flange, without tube)	approx. 9.8 ... 11.8 kg (21.6... 26.0 (lb))
Error in measurement at limit setting incl. hysteresis and reproducibility			• To ASME (pressure transmitter with mounting flange, without tube)	approx. 9.8 ... 16.8 kg (21.6 ... 37.0 (lb))
r: Span ratio (r = max. span / set span)				
Linear characteristic	r ≤ 10	r ≥ 10		
• 250 mbar (100 inH ₂ O) 1250 mbar (502 inH ₂ O) 6250 mbar (2509 inH ₂ O)	≤ 0.03 %	≤ (0.003 · r) %		

Pressure Measurement

Pressure transmitters
for applications with highest requirements (Premium)
SITRANS P500

for level

Material of wetted parts at the high-pressure side		Auxiliary power supply	
• 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	Terminal voltage on transmitter	<ul style="list-style-type: none"> • DC 10.6 ... 44 V • With intrinsically-safe operation DC 10.6 ... 30 V
• Sealing surface	Smooth to EN 1092-1, Form B1 and/or ASME B16.5 RF 125 ... 250 AA for stainless steel 316L, EN 1092-1 Form B2 and/or ASME B16.5 RFSF in the case of other materials	Certificates and approvals	
• Sealing material in the process connection		Classification according to PED 2014/68/EU	
- O-Ring	<ul style="list-style-type: none"> • Standard: Viton (FKM (FPM)) • Optional: NBR, PTFE (virginal), PTFE (glas fiber-reinforced), FPM (Kalrez), Graphite 	• 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)
- For vacuum application of mounting flange	Copper	Explosion protection	
Material of wetted parts at the low-pressure side		<u>Explosion protection for Europe (to ATEX)</u>	
• Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Hastelloy C276, Monel 400	• Intrinsic safety "i"	PTB 09 ATEX 2004 X
• Process connection and sealing screw	• Stainless steel, mat. no. 1.4404/316L	- Marking	Ex II 1/2 G Ex ia/ib IIC T4
• Sealing material in the process connection	<ul style="list-style-type: none"> • Standard: Viton (FKM (FPM)) • Optional: NBR, PTFE (virginal), PTFE (glas fiber-reinforced), FPM (Kalrez), Graphite 	- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)
- O-Ring		- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$; $R_i = 300 \Omega$
Material of parts not in contact with media		- Effective internal inductance:	$L_i = 400 \mu\text{H}$
Die-cast aluminum housing	<ul style="list-style-type: none"> • 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 	- Effective inner capacitance:	$C_i = 6 \text{ nF}$
Stainless steel precision cast housing	Stainless steel, mat. no. 1.4404/316L	• Explosion-proof "d"	BVS 09 ATEX E 027
Process connection screws	Stainless steel	- Marking	Ex II 1/2 G Ex db ia IIC T4/T6 Ga/Gb
Measuring cell filling	Silicone oil	- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F) temperature class T4; -40 ... +60 °C (-40 ... +140 °F) temperature class T6
• Liquid mounting flange	Silicone oil or other material	- Connection	To circuits with values: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
Process connection		• Dust explosion protection for zone 20	BVS 09 ATEX E 027
• High-pressure side	Flange to EN and ASME	- Marking	Ex II 1 D Ex ta ia IIC T120°C Da
• Low-pressure side	1/4-18 NPT female thread and flange connection with M10 to DIN 19213 or 7/16-20 UNF mounting thread to IEC 61518/DIN EN 61518	- Permissible ambient temperature	-40 ... +85 °C (-40 ... +185 °F)
Electrical connection	<ul style="list-style-type: none"> • Screw terminals • Cable entry via the following screwed glands: <ul style="list-style-type: none"> - M20 x 1.5 - 1/2-14 NPT - Device plug Han 7D/Han 8D - Device plug M12 	- Max. surface temperature	120 °C (248 °F)
Displays and controls		- Connection	To certified intrinsically-safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \Omega$
Push buttons	3; for operation directly on the device	- Effective internal inductance:	$L_i = 400 \mu\text{H}$
Display	<ul style="list-style-type: none"> • With or without integrated display • Cover with or without window 	- Effective inner capacitance:	$C_i = 6 \text{ nF}$
		• Dust explosion protection for zone 21/22	BVS 09 ATEX E 027
		- Marking	Ex II 2 D Ex tb ia IIC T120°C Db
		- Connection	To circuits with values: $U_H = 10.5 \dots 45 \text{ V DC}$; $P_{\text{max}} = 1.2 \text{ W}$
		• 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	$U_m = 45 \text{ V DC}$
		- "nL, ic" connection	$U_i = 45 \text{ V}$
		- Effective internal inductance	$L_i = 400 \mu\text{H}$
		- Effective inner capacitance	$C_i = 6 \text{ nF}$

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	$T_a = T4: -40 \dots +85 \text{ }^{\circ}\text{C}$ (-40 ... +185 °F) $T_a = T6: -40 \dots +60 \text{ }^{\circ}\text{C}$ (-40 ... +140 °F)
- Entity parameters	According to "control drawing": A5E02189134N $U_m = 30 \text{ V}$, $I_m = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $L_i = 400 \text{ } \mu\text{H}$, $C_i = 6 \text{ nF}$
• 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	$T_a = T4: -40 \dots +85 \text{ }^{\circ}\text{C}$ (-40 ... +185 °F) $T_a = T6: -40 \dots +60 \text{ }^{\circ}\text{C}$ (-40 ... +140 °F)
- (NI/S) parameters	According to "control drawing": A5E02189134N $U_m = 45 \text{ V}$, $L_i = 400 \text{ } \mu\text{H}$, $C_i = 6 \text{ nF}$

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	$T_a = T4: -40 \dots +85 \text{ }^{\circ}\text{C}$ (-40 ... +185 °F) $T_a = T6: -40 \dots +60 \text{ }^{\circ}\text{C}$ (-40 ... +140 °F)
- Entity parameters	According to "control drawing": A5E02189134N, $U_m = 45 \text{ V}$
• 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	$T_a = T4: -40 \dots +85 \text{ }^{\circ}\text{C}$ (-40 ... +185 °F)
- Entity parameters	$U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$, $R_i = 300 \text{ } \Omega$, $L_i = 400 \text{ } \mu\text{H}$, $C_i = 6 \text{ nF}$
• 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	$T_a = T4: -40 \dots +85 \text{ }^{\circ}\text{C}$ (-40 ... +185 °F) $T_a = T6: -40 \dots +60 \text{ }^{\circ}\text{C}$ (-40 ... +140 °F)
- NI/nA parameters	According to "control drawing": A5E02189134N, $U_m = 45 \text{ V}$
- nL parameters	According to "control drawing": A5E02189134N, $U_i = 45 \text{ V}$, $I_i = 100 \text{ mA}$, $L_i = 400 \text{ } \mu\text{H}$, $C_i = 6 \text{ nF}$

Explosion protection for China
(acc. to NEPSI)

• Intrinsic safety "i"	GYJ111111X Ex ia/ib IIB/IIC T4 40 ... +85 °C (-40 ... +185 °F)
- Marking	
- Permissible ambient temperature	
- Connection	To certified intrinsically-safe circuits with maximum values: $U_i = 30 \text{ V}$, $I_i = 100 \text{ mA}$, $P_i = 750 \text{ mW}$
- Effective internal inductance	$L_i = 400 \text{ mH}$
- Effective inner capacitance	$C_i = 6 \text{ nF}$
• 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: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
• Dust explosion protection for zone 21/22	GYJ111112
- Marking	DIP A21 TA,T120 °C IP68 D21
- Connection	To circuits with values: $U_m = \text{DC } 10.5 \dots 45 \text{ V}$
• Type of protection "n" (zone 2)	GYJ111111X
- Marking	Ex nL IIB/IIC T4/T6 Ex nA II T4/T6
- Connection	$U_i = 45 \text{ V DC}$
- Effective internal inductance	$L_i = 400 \text{ mH}$
- Effective inner capacitance	$C_i = 6 \text{ nF}$

- 1) Only relevant for the pressure transmitter. The temperature error of the remote seal must be 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	$R_B = 230 \dots 1100 \text{ } \Omega$
• HART modem	$R_B = 230 \dots 500 \text{ } \Omega$
Cable	2 wire shielded: $\leq 3.0 \text{ km}$ (1.86 miles), multiwire shielded: $\leq 1.5 \text{ km}$ (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

Pressure Measurement

Pressure transmitters

for applications with highest requirements (Premium)

SITRANS P500

for level

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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 gland⁹⁾		
Die-cast aluminum, dual compartment	M20x1.5	0	
Die-cast aluminum, dual compartment	½-14 NPT	1	
Stainless steel precision casting, two-chamber housing	M20x1.5	2	
Stainless steel precision casting, two-chamber housing	½-14 NPT	3	
Output		3	
4 ... 20 mA, HART			
Measuring cell filling	Measuring cell cleaning		
Silicone oil	normal	1	
Measuring span (min. ... max.)			
1.25 ... 250 mbar	(0.5 ... 100 inH ₂ O)	D	
6.25 ... 1250 mbar	(2.5 ... 500 inH ₂ O)	E	
31.25 ... 6250 mbar	(12.54 ... 2509 inH ₂ O)	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			
<ul style="list-style-type: none"> Sealing screw opposite process connection <ul style="list-style-type: none"> Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518 Mounting thread M10 to DIN 19213 Vent on side of process flange <ul style="list-style-type: none"> Mounting thread 7/16 - 20 UNF according to IEC 61518/DIN EN 61518 Mounting thread M10 to DIN 19213 		0	
		1	
		4	
		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		9 Y	N 1 Y
Add Order code and plain text:			
Material: ... ; Extension length: ...			
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		Z	
Order code and plain text:			
Nominal diameter: ... ; Nominal pressure: ...			Q 1 Y

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		9
Order code and plain text:		R1Y
Filling liquid: ...		

Pressure Measurement

Pressure transmitters

for applications with highest requirements (Premium)

SITRANS P500

for level

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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/casing

Two coats of lacquer on casing, cover (PU on epoxy)

A20

Electrical connection and cable entry

(Standard: no cable gland, only dust protection caps)

Cable gland made of plastic (IP66/68)⁴⁾

A50

Cable glands made of metal (IP66/68)

A51

Cable glands made of stainless steel (IP66/68)

A52

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 adapters⁴⁾

A82

Language for labels, quick-start guide and menu language default⁸⁾

(instead of English as standard)

German

B10

French

B12

Spanish

B13

Italian

B14

Chinese

B15

Russian

B16

Japanese

B17

English with units: psi/inH₂O

B21

Special version: Supplementary menu languages

(Standard: English, German, French, Spanish, Italian)

Asia language package (in addition: Chinese, Japanese, Russian)

B80

Certificates (available online for downloading)¹⁾

Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2²⁾

C11

Acceptance test certificate according to EN 10204-3.1³⁾

C12

Acceptance 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 approval⁵⁾

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 1/4-18 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 1/4- 18 NPT, in material of process flange)

L80

Vacuum-proof design

Vacuum service

V04

Spark arrester

V05

For mounting on zone 0 (including documentation)

¹⁾ Enclosed in print or as DVD: see page 1/320.

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

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

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

⁵⁾ Only in conjunction with FM and/or C_{CSA}US

⁶⁾ Not recommended for Measuring span "D"

⁷⁾ The 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⁾ Cable glands must be ordered separately from "Further designs" (add "-Z" to Article No. and specify order code).

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 ₂ O*, in H ₂ O*, ftH ₂ O*, 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 units¹⁾ 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.

Pressure Measurement

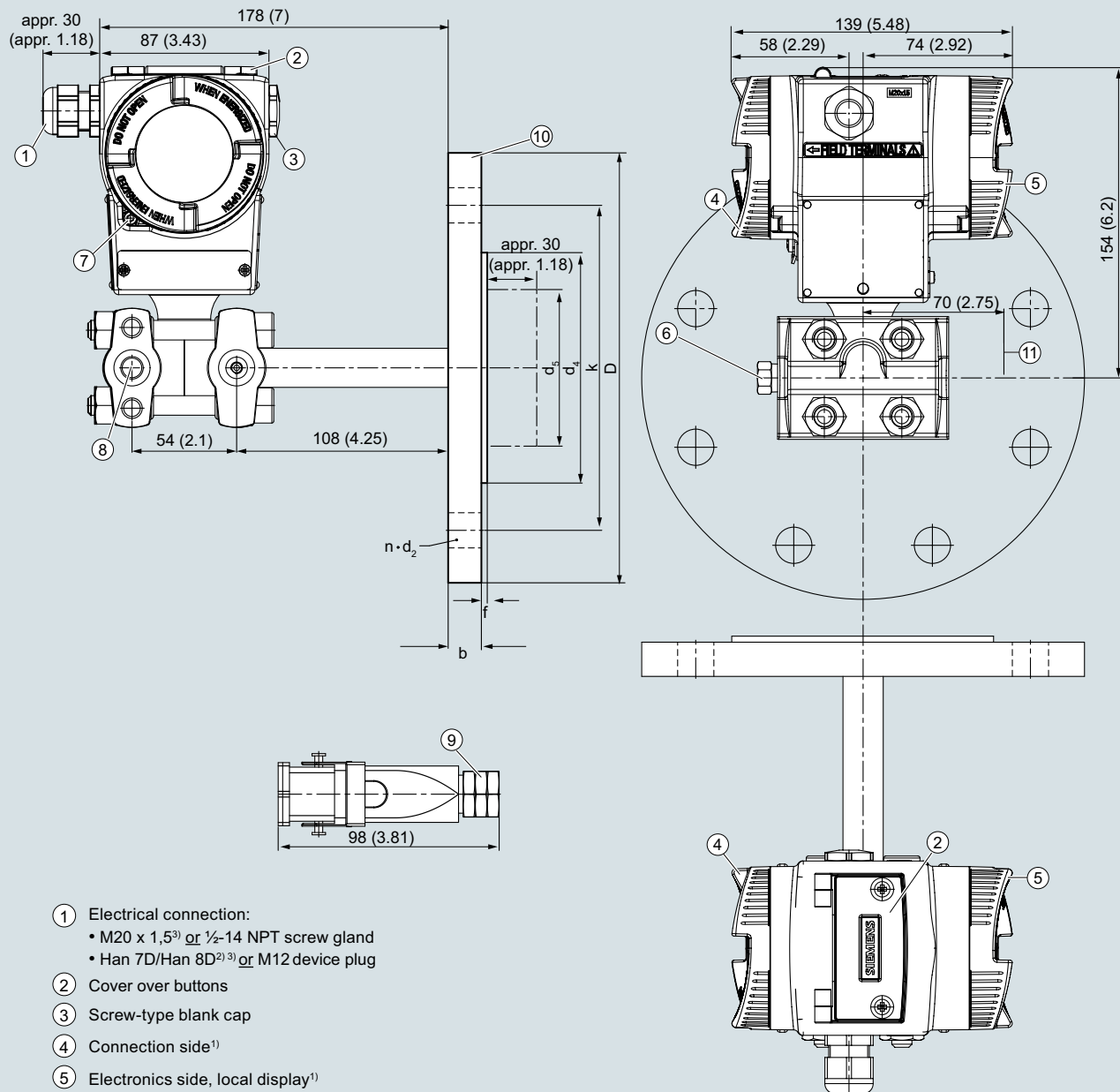
Pressure transmitters

for applications with highest requirements (Premium)

SITRANS P500

for level

Dimensional drawings



- ① Electrical connection:
 - M20 x 1,5³⁾ 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 side¹⁾
- ⑤ Electronics side, local display¹⁾
- 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)

Connection to EN 1092-1

Nominal diameter	Nominal pressure	b mm	D mm	d mm	d ₂ mm	d ₄ mm	d ₅ mm	d _M mm	f mm	k mm	n	L 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 lb/sq.in.	b inch (mm)	D inch (mm)	d ₂ inch (mm)	d ₄ inch (mm)	d ₅ inch (mm)	d _M inch (mm)	f inch (mm)	k inch (mm)	n	L 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
	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	(0, 50, 100, 150 or 200)
	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

d₅: 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.

Pressure Measurement

Pressure transmitters

for applications with highest requirements (Premium)

SITRANS P500

Accessories/Spare parts

1

Selection and Ordering data

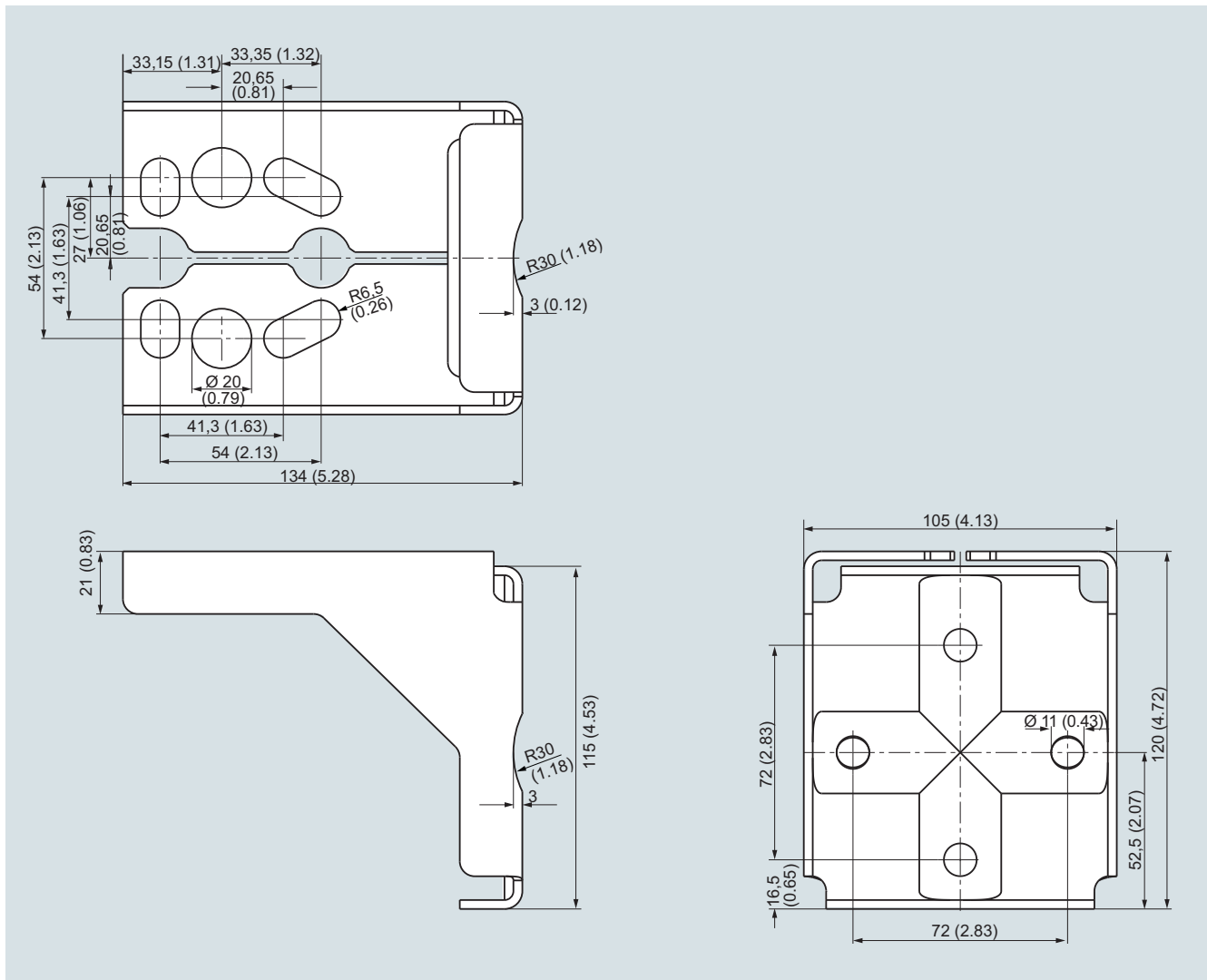
	Article No.
Mounting brackets For differential pressure transmitters with flange thread M10 (7MF54...-...10 and 7MF54...-...50) <ul style="list-style-type: none"> • Made of steel • Made of stainless steel 	7MF5987-1AA 7MF5987-1AD
Mounting brackets for differential pressure transmitter with flange thread 7/16-20 UNF (7MF54...-...00 and 7MF54...-...40) <ul style="list-style-type: none"> • Made of steel • Made of stainless steel 	7MF5987-1AC 7MF5987-1AF
Cover Made of die-cast aluminum, including O-ring <ul style="list-style-type: none"> • Without inspection window • With inspection window Made of stainless steel, including seal	7MF5987-1BE 7MF5987-1BF
Digital indicator Including mounting material	7MF5987-1BR
TAG plate (incl. fastening material) Without inscription (5 pcs.) Printed (1 pc.) Data according to Y01 or Y02, Y15 and Y16 (see "SITRANS P transmitters")	7MF5987-1CA 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) <ul style="list-style-type: none"> • Made of stainless steel • Made of Hastelloy 	7MF4997-1CG 7MF4997-1CH
Screw plugs with valve Complete (1 set = 2 parts) <ul style="list-style-type: none"> • Made of stainless steel • Made of Hastelloy 	7MF4997-1CP 7MF4997-1CQ
Connection board (incl. fastening material) HART, intrinsically safe Ex ia for installation in transmitter casing (observe warranty conditions)	7MF5987-1DM
Push buttons assembly (incl. fastening material) For replacement of operating keys for on-site operation of the transmitter	7MF5987-2AF
Sealing ring for <ul style="list-style-type: none"> • Process connection • NBR sealing ring for screw cover (10 pcs.) • NBR sealing ring for interface measuring cell/housing (10 pcs.) 	See catalog FI01, "Fittings" 7MF4997-2EA 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 <ul style="list-style-type: none"> • German, Spanish, French, Italian, Dutch • Estonian, Latvian, Lithuanian, Polish, Romanian • Bulgarian, Czech, Finnish, Slovakian, Slovenian • Danish, Greek, Portuguese, Swedish, Hungarian • Russian 	A5E02344532 A5E02307339 A5E02307340 A5E02307341 A5E02307338
HART modem With USB interface	7MF4997-1DB
Certificates (order only via SAP) additional to internet download <ul style="list-style-type: none"> • Hard copy (to order) • On DVD (to order) 	A5E03252406 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)

Pressure Measurement

Pressure transmitters

for applications with highest requirements (Premium)

SITRANS P500

Factory-mounting of valve manifolds on transmitters

1

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 sealing rings 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 test report to EN 10204 - 2.2.

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

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

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

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
- Stainless steel

U01

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
- Stainless steel

A01

A02

(instead of the mounting bracket supplied with the transmitter)

Supplied acceptance test certificate to EN 10204-3.1 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
- Stainless steel

U03

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
- Stainless steel

A01

A02

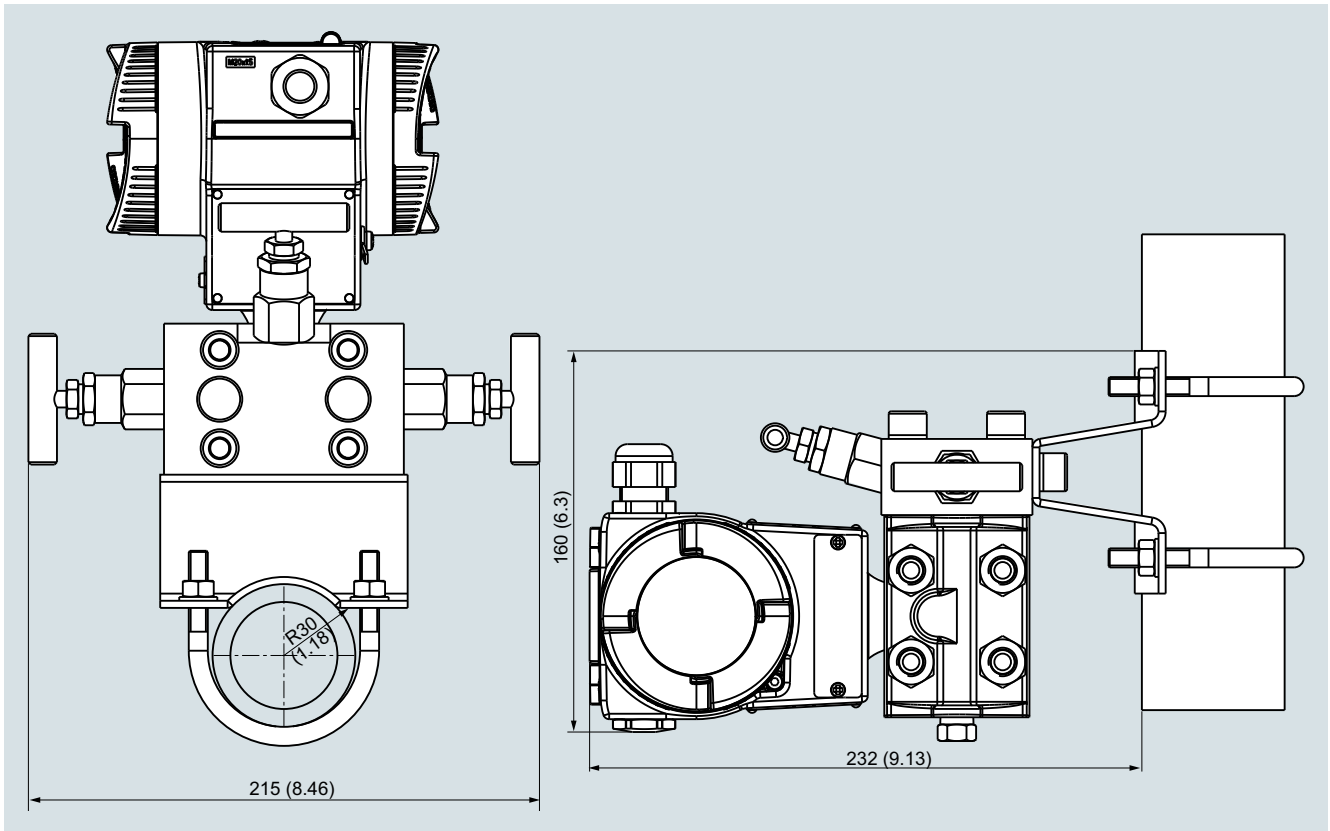
(instead of the mounting bracket supplied with the transmitter)

Supplied acceptance test certificate to EN 10204-3.1 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)

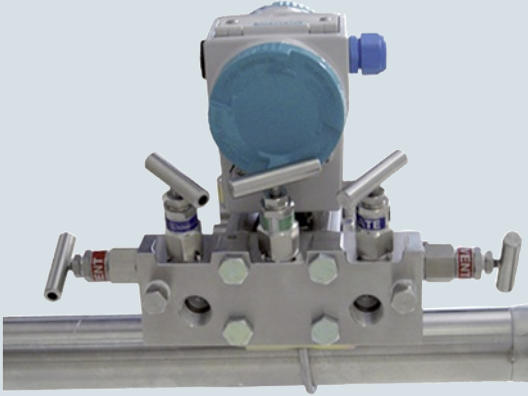
Pressure Measurement

Pressure transmitters

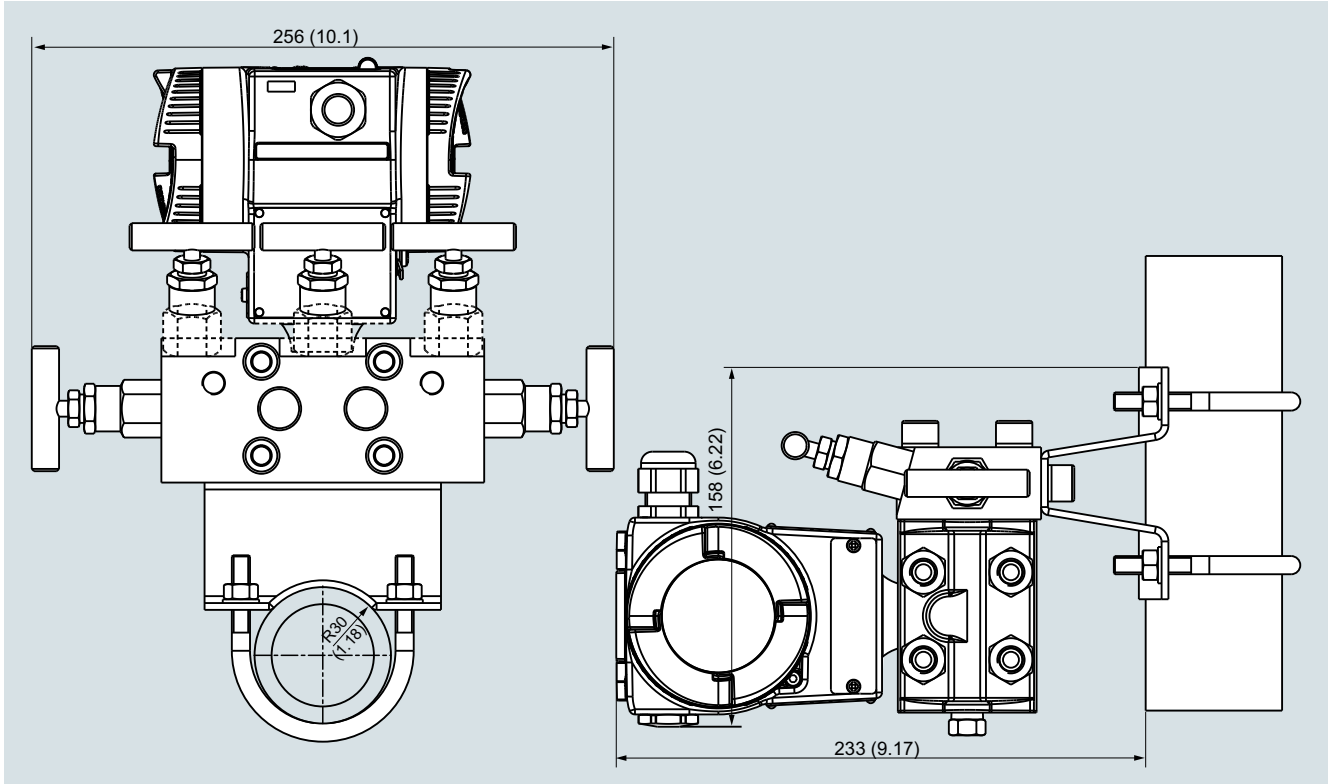
for applications with highest requirements (Premium)

SITRANS P500

Factory-mounting of valve manifolds on transmitters



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)

Overview

In many cases the pressure transmitter and the measured 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 measured 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 volume in contact with the measured medium is terminated by a flat elastic diaphragm lying in a bed. Between the diaphragm and the pressure transmitter is the filling liquid.

In many cases, a capillary has to be connected between the remote seal and the pressure transmitter in order e.g. to minimize temperature effects on the latter when hot media are involved.

However, the capillary influences the response time and the temperature response of the complete remote seal system. Two capillaries of equal length must always be used to connect a remote seal to a pressure transmitter for differential pressure.

The remote seal can be optionally equipped with a projecting diaphragm (tube).

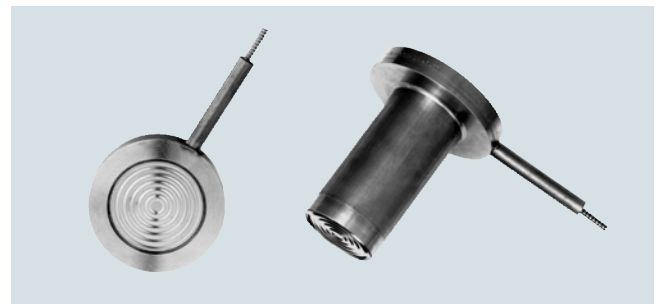
Remote seals of sandwich design are fitted with a dummy flange.

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

Pressure Measurement

Remote seals for pressure transmitters SITRANS P320/P420

1

Technical description

- 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 measured medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismantling is possible for cleaning.

Clamp-on seal



Clamp-on seal with quick-release design (left) and for flange mounting

With clamp-on 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 clamp-on 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 clamp-on seal can be cleaned by a pig.

The following types of clamp-on seals exist:

- Quick-release clamp-on 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.
- Clamp-on seals for flanging to EN or ASME.
- Clamp-on 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 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 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.

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

1

Technical description

Technical specifications of the remote seal filling liquids

Filling liquid	Number in the Article No.	Density at 20°C [kg/dm ³]	Viscosity at 20°C [mm ² /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".

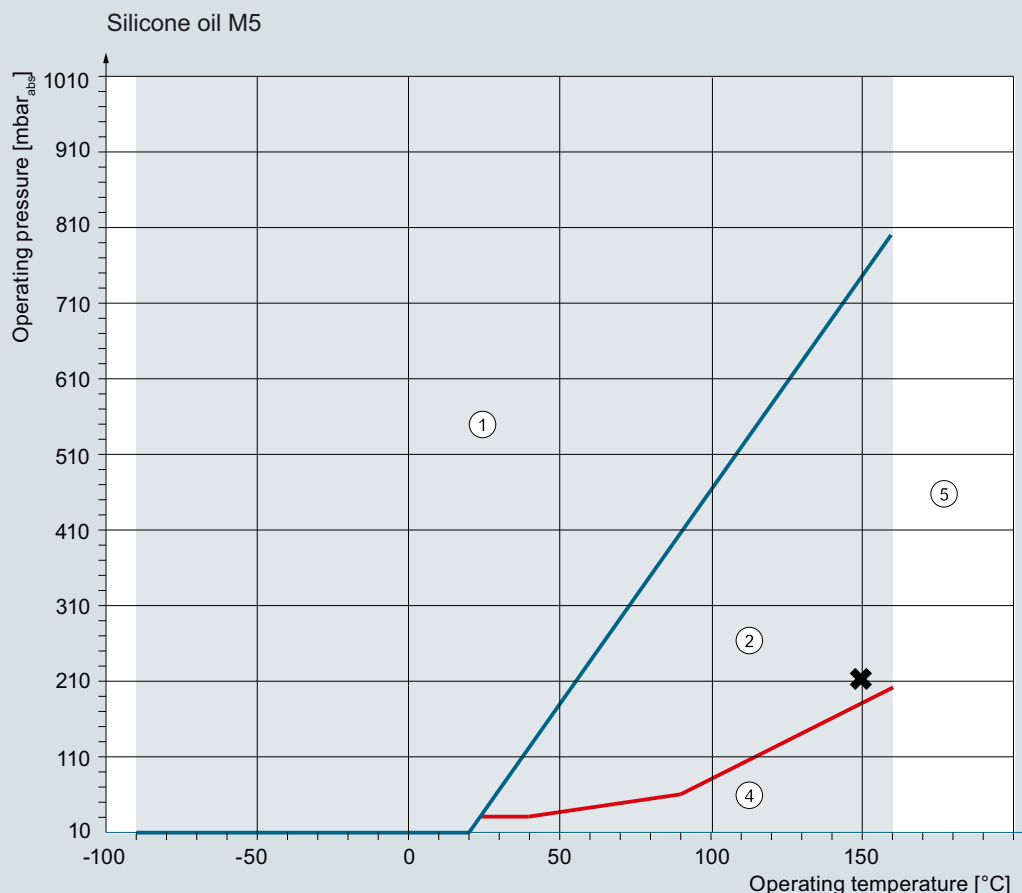
Selection of the required negative pressure service

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 "x" 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.

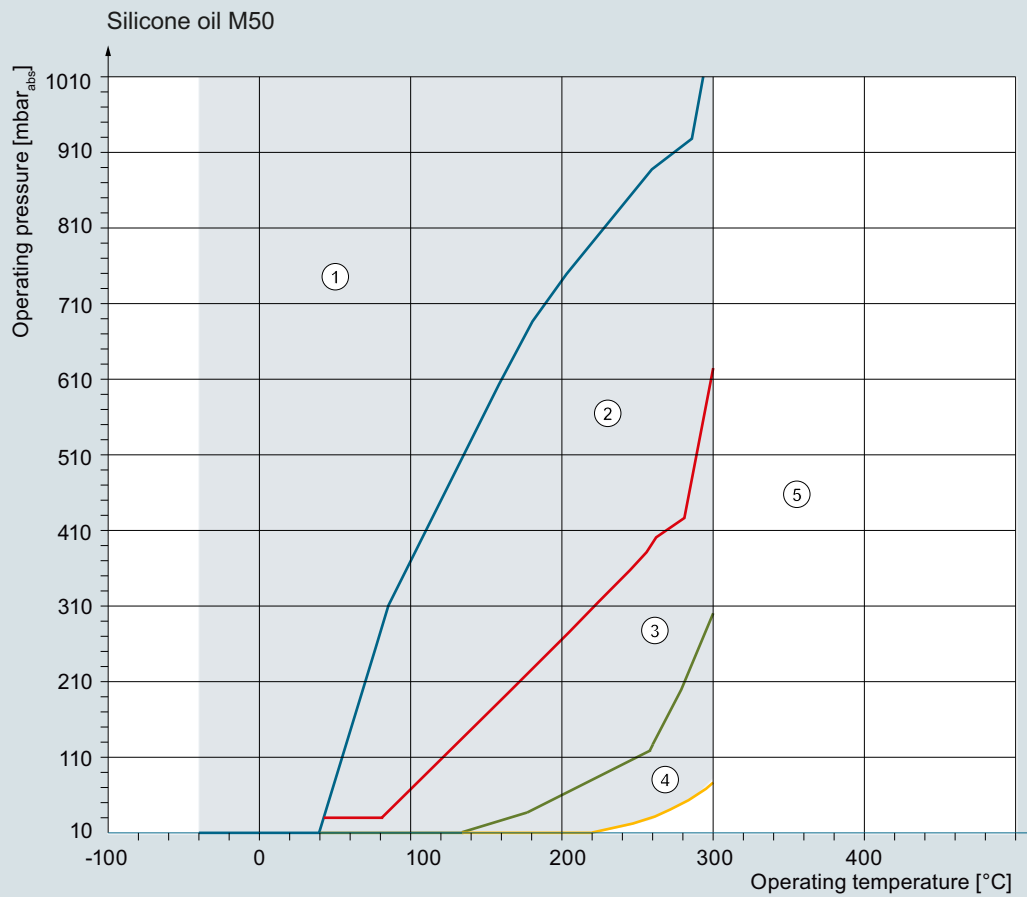
Note:

Note the response times according to the table on page 1/337.



- 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



- 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.

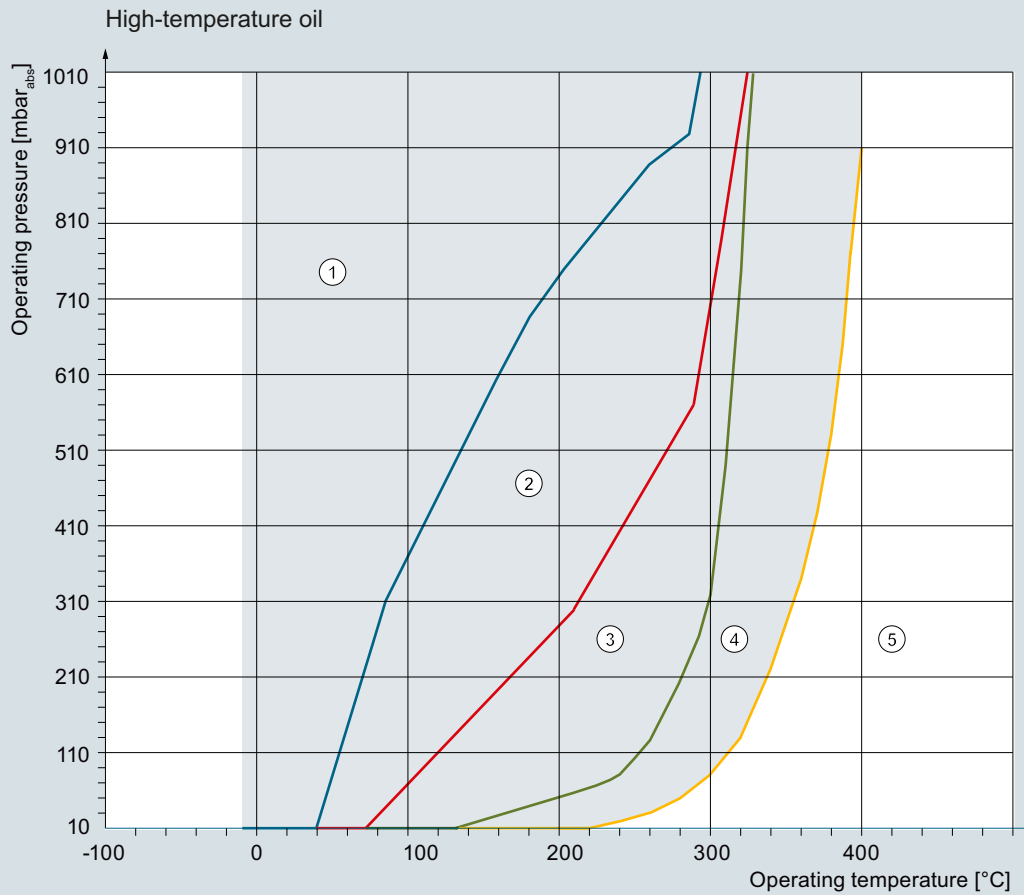
Permissible operating range:
Max. temperature limit: 300 °C
Min. temperature limit: -40 °C

Negative pressure applications with silicone oil M50

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

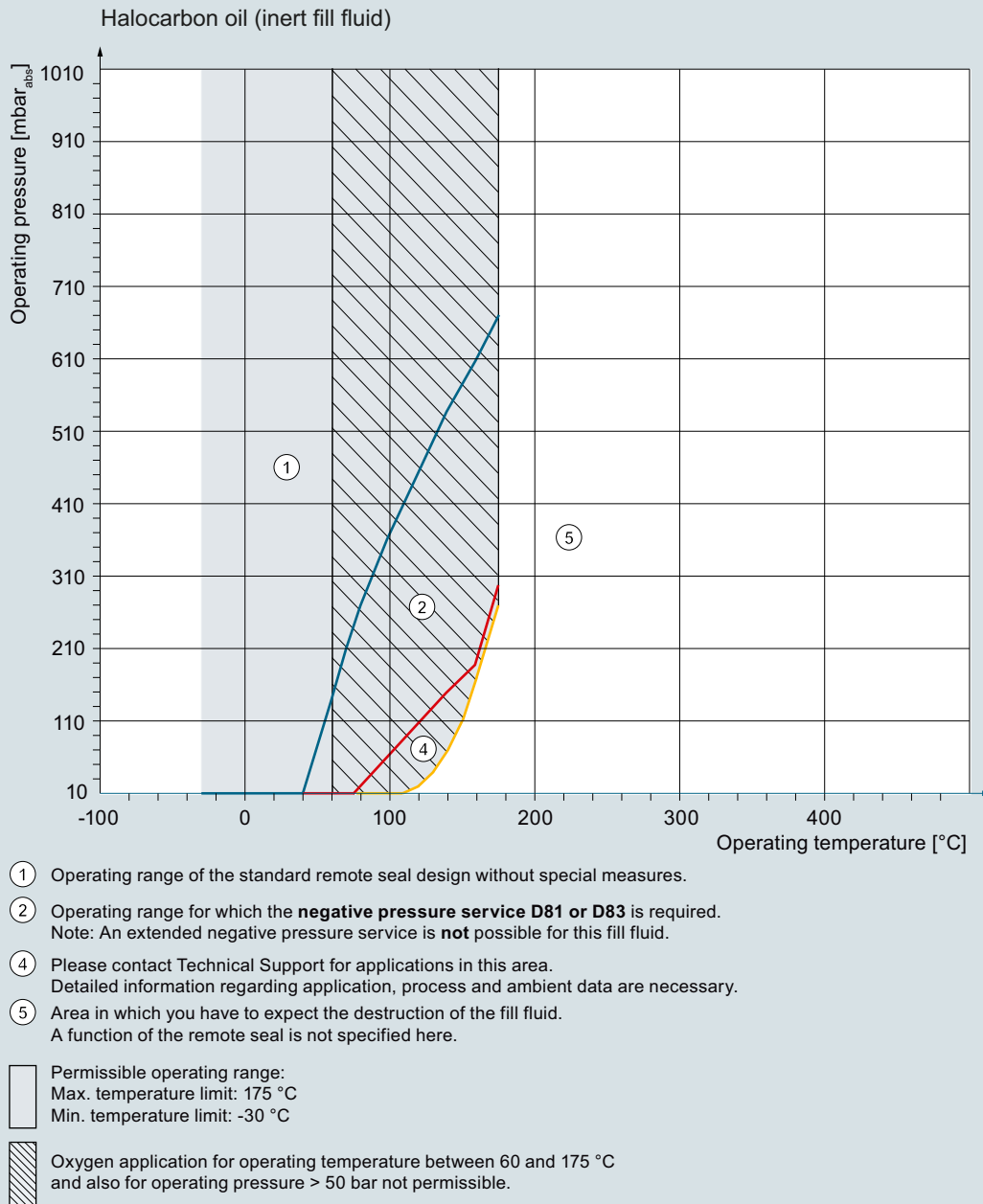
Technical description



- 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.
- 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



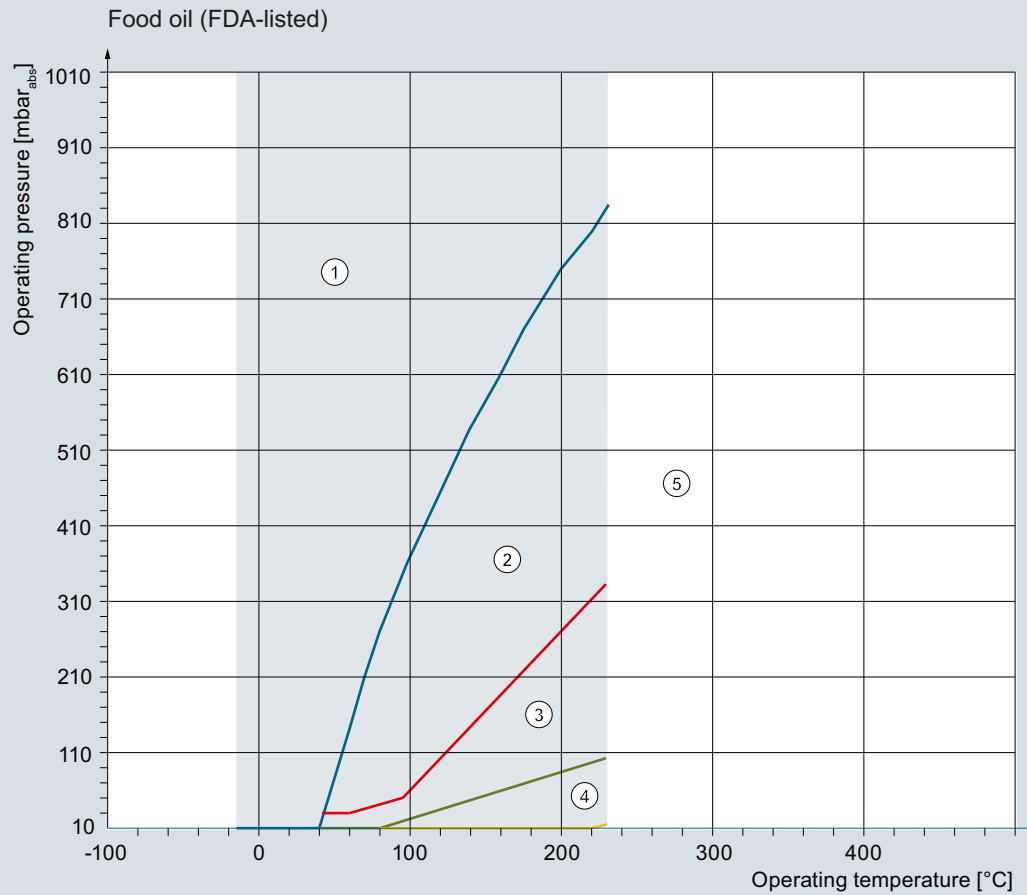
Negative pressure applications with halocarbon oil (inert filling liquid)

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.

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

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.
- 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/connec- tion spigot f_{PF}		Recommended min. spans (guid- ance 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 connec- tion	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 dia- phragm 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.

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Technical description

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/connec- tion spigot f_{PF}		Recommended min. spans (guidance val- ues, 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 connec- tion	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 Clamp-on seals

Temperature errors of clamp-on 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 pro- cess flange/connection spigot f_{PF}		Recommended min. 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 clamp-on 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 pro- cess flange/connection spigot f_{PF}		Recommended min. 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

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Technical description

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	$f_{RS} = 0.05 \text{ mbar}/10 \text{ K}$ (0.039 inH ₂ O/10 K)
Capillary length	$l_{Cap} = 6 \text{ m (19.7 ft)}$
Capillaries fitted on both sides	$f_{Cap} = 0.07 \text{ mbar}/(10 \text{ K} \cdot m_{Cap})$ (0.028 inH ₂ O/(10 K · m _{Cap}))
Filling liquid silicone oil M5	$f_{PF} = 0.07 \text{ mbar}/10 \text{ K}$ (0.028 inH ₂ O/10 K)
Process temperature	$\vartheta_{RS} = 100 \text{ °C (212 °F)}$
Temperature on the capillaries	$\vartheta_{Cap} = 50 \text{ °C (122 °F)}$
Temperature on pressure transmitter	$\vartheta_{TR} = 50 \text{ °C (122 °F)}$
Calibration temperature	$\vartheta_{Cal} = 20 \text{ °C (68 °F)}$

Required:

Additional temperature error of remote seals: dp

Calculation:

in mbar

$$dp = (100 \text{ °C} - 20 \text{ °C}) \cdot 0.05 \text{ mbar}/10 \text{ K} + (50 \text{ °C} - 20 \text{ °C}) \cdot 6 \text{ m} \cdot 0.07 \text{ mbar}/(10 \text{ K} \cdot \text{m}) + (50 \text{ °C} - 20 \text{ °C}) \cdot 0.07 \text{ mbar}/10 \text{ K}$$

$$dp = 0.4 \text{ mbar} + 1.26 \text{ mbar} + 0.21 \text{ mbar}$$

in inH₂O

$$dp = (212 \text{ °F} - 68 \text{ °F}) \cdot 0.039 \text{ inH}_2\text{O}/10 \text{ K} + (112 \text{ °F} - 68 \text{ °F}) \cdot 19.7 \text{ ft} \cdot 0.028 \text{ inH}_2\text{O}/(10 \text{ K} \cdot 3.28 \text{ ft}) + (112 \text{ °F} - 68 \text{ °F}) \cdot (0.028 \text{ inH}_2\text{O}/10 \text{ K})$$

$$dp = 0.16 \text{ inH}_2\text{O} + 0.51 \text{ inH}_2\text{O} + 0.08 \text{ inH}_2\text{O}$$

Result:

dp = 1.87 mbar (0.75 inH₂O)
(corresponds to 2.27% of set 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		Clamp-on 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 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 span within the range of the respective transmitter. The response times are of insignificant importance for 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. span of pressure transmitter					
	kg/dm ³	(lb/in ³)	°C	(°F)	250 mbar	(101 inH ₂ O)	600 mbar	(241 inH ₂ O)	1600 mbar	(643 inH ₂ O)
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 1/328 ff.

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Technical description

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

- -10 ... +50 °C (14 ... +122 °F) preset
- -40 ... +50 °C (-40 ... +122 °F)
- -10 ... +85 °C (14 ... +185 °F)

D66
D67
D68

Process temperature min. ... °C/(°F)/max. ... °C/(°F)

Y50

Overview



Diaphragm seals of sandwich design

Technical specifications

Diaphragm seals of sandwich design

Nominal diameter	Nominal pressure	Sealing material in the process flanges	
Connecting standard EN 1092-1		<ul style="list-style-type: none"> For pressure transmitters, absolute pressure transmitters and low-pressure applications For other applications 	Copper Viton
<ul style="list-style-type: none"> DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125 	PN 16 ... PN 400		
Connecting standard ASME B16.5		Maximum pressure	See above and the technical data of the pressure transmitters
<ul style="list-style-type: none"> 1 inch, 1½ inch, 2 inch, 2½ inch, 3 inch, 4 inch, 5 inch 	Class 150 ... class 2500	Tube length	Without tube as standard (tube available on request)
Connecting standard J.I.S.		Capillary	
<ul style="list-style-type: none"> DN 25, DN 40, DN 50, DN 65, DN 80, DN 100, DN 125 	10K ... 63K	<ul style="list-style-type: none"> Length 	Max. 10 m (32.8 ft), longer lengths on request
Sealing surface		<ul style="list-style-type: none"> Internal diameter Minimum bending radius 	max. 2 mm (0.079 inch) 150 mm (5.9 inch)
<ul style="list-style-type: none"> For stainless steel, mat. No. 1.4404/316L For the other materials 	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA To EN 1092-1, form B2 or ASME B16.5 RFSF	Filling liquid	Silicone oil M5 Silicone oil M50 High-temperature oil Halocarbon oil (for measuring O ₂) Food grade oil (FDA listed)
Materials		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
<ul style="list-style-type: none"> Main body Wetted parts 	Stainless steel mat. no. 1.4404/316L Stainless steel mat. no. 1.4404/316L <ul style="list-style-type: none"> 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	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)
<ul style="list-style-type: none"> Capillary Sheath 	Stainless steel, mat. No. 1.4571/316Ti Spiral protective tube made of stainless steel, mat. No. 1.4404/316L		

Pressure Measurement

Remote seals for pressure transmitters

SITRANS P320/P420

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
- SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off

7MF0800 -

7MF0801 -

7MF0802 -

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
- SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off

7MF0800 -

7MF0801 -

7MF0802 -

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 M5

A

Silicone oil M50

B

High-temperature oil

C

Halocarbon oil

D

Food-grade oil (FDA listed)

E

Other version

Z

Add Order code and plain text

P1Y

Wetted parts materials

Stainless steel 316L

A

• Without coating

D

• With PFA coating

E

• With PTFE coating

F

• With ECTFE coating

G

Monel 400, 2.4360

J

Hastelloy C276, 2.4819

K

Tantalum

L

Titanium, 3.7035

M

Nickel 201

O

Diaphragm Duplex, 1.4462

Q

Diaphragm plus flange Duplex, 1.4462

R

Stainless steel 316L with gold coating

S

Hastelloy C4, 2.4610

U

Hastelloy C22, 2.4602

V

Other version

Z

Add Order code and plain text

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

Z

Add Order code and plain text

Q1Y




Pressure Measurement

Remote seals for pressure transmitters

SITRANS P320/P420

Diaphragm seals of sandwich design with flexible capillary

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Selection and Ordering data		Article No.	Order code
Diaphragm seal			
Sandwich type design, with flexible capillary tube, connected with flexible capillary tube to a			
<ul style="list-style-type: none"> 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 -	
<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off 		7MF0801 -	
<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off 		7MF0802 -	
			- 0
Customer-specific extension length			
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> 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	
			- 0
Diaphragm seal			
Sandwich type design, with flexible capillary tube, connected with flexible capillary tube to a			
<ul style="list-style-type: none"> 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 -	
<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for absolute pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off 		7MF0801 -	
<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off 		7MF0802 -	
			- 0
<ul style="list-style-type: none"> 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	
<ul style="list-style-type: none"> 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	

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

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Diaphragm seals of sandwich design with flexible capillary

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs Add "-Z" to Article No. and specify 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	Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)	M82
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	C12	• DN 25	M83
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	• DN 40	M84
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	C15	• DN 50	M85
Certificate of FDA-approved fill oil (to EN10204-2.2)	C17	• DN 80	M86
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)	C20	• DN 100	M87
		• DN 125	
Accessories Spark arrestor (for gauge and absolute pressure transmitters)	D61	Capillary connection (only for 7MF0800)	
Spark arrestor (for differential pressure and level transmitters)	D62	Single-side mounted at differential pressure transmitters at high-side	S03
Low-temperature version (for Silicon Oil M50 only)	D67	Single-side mounted at differential pressure transmitters at low-side	S04
Negative pressure services Negative pressure service (for gauge and absolute pressure transmitters)	D81	Capillary coating PE protective tube	
Negative pressure service (for differential pressure transmitters)	D83	1 m	S10
Extended negative pressure service (for gauge and absolute pressure transmitters) (only 7MF0800)	D85	1,6 m	S11
Extended negative pressure service (for differential pressure transmitters)	D88	2 m	S12
		2,5 m	S13
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	3 m	S14
Oil-and grease-free cleaned version (not for O ₂ -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)	E87	4 m	S15
		5 m	S16
Sealing surface Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)	M50	6 m	S17
Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)	M54	7 m	S18
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)	M64	8 m	S19
Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)		9 m	S20
• DN 25	M70	10 m	S21
• DN 40	M71	11 m (only for 7MF0802)	S22
• DN 50	M72	12 m (only for 7MF0802)	S23
• DN 80	M73	13 m (only for 7MF0802)	S24
• DN 100	M74	14 m (only for 7MF0802)	S25
• DN 125	M75	15 m (only for 7MF0802)	S26
Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)		PTFE protective tube	
• DN 25	M76	1 m	S40
• DN 40	M77	1,6 m	S41
• DN 50	M78	2 m	S42
• DN 80	M79	2,5 m	S43
• DN 100	M80	3 m	S44
• DN 125	M81	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

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Selection and Ordering data	Order code
Further designs	
Add "-Z" to Article No. and specify Order code.	
<u>PVC protective tube</u>	
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 conditions¹⁾	
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 1/338.

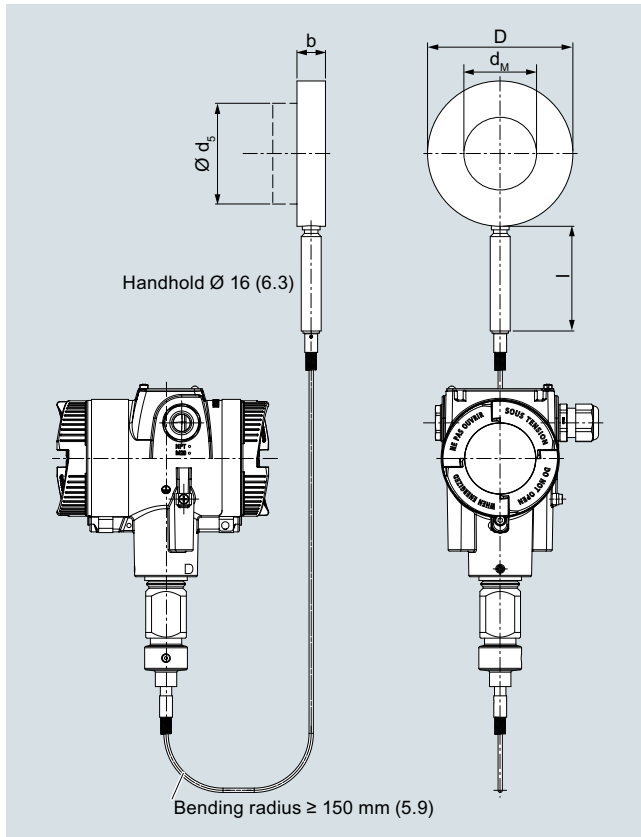
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

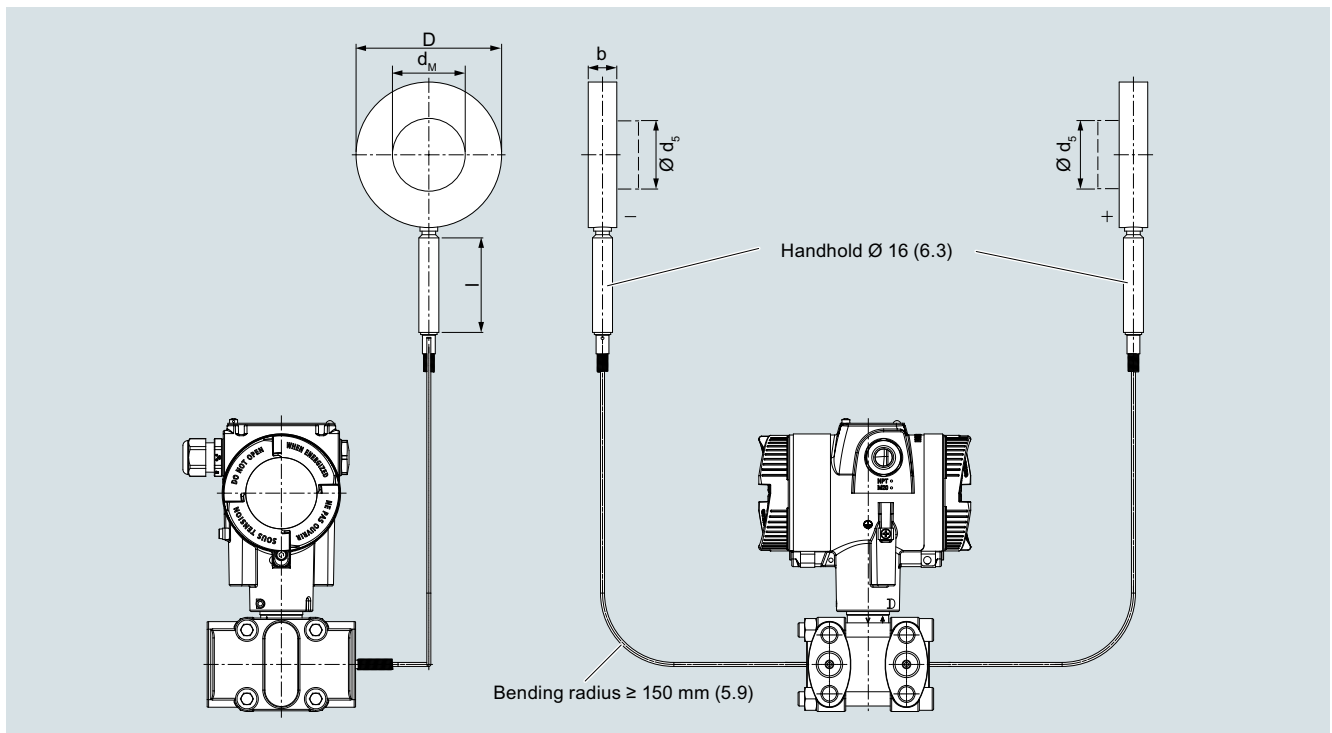
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Diaphragm seals of sandwich design with flexible capillary

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)

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 ...	20	68	24,5	22.6	27	100
DN 40	PN 400	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

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

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Diaphragm seals of flange design with flexible capillary

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
- Wetted parts

Stainless steel
mat. no. 1.4404/316L
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

Stainless steel, mat. No. 1.4571/316Ti

Spiral protective tube made of stainless steel, mat. no. 1.4404/316L

- Capillary

- Sheath

Sealing material in the process flanges

- For pressure transmitters, absolute pressure transmitters and low-pressure applications
- For other applications

Copper

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 O₂)

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)



Pressure Measurement

Remote seals for pressure transmitters

SITRANS P320/P420

Diaphragm seals of flange design with flexible capillary

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Selection and Ordering data		Article No.	Order code	Selection and Ordering data		Article No.	Order code
Diaphragm seal				Diaphragm seal			
Flange type design, with flexible capillary tube, connected with flexible capillary tube to a				Flange type design, with flexible capillary tube, connected with flexible capillary tube to a			
<ul style="list-style-type: none"> 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 -		<ul style="list-style-type: none"> 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 -	
<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for absolute pressure from differential pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off 		7MF0811 -		<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for absolute pressure from differential pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off 		7MF0811 -	
<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off 		7MF0812 -		<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off 		7MF0812 -	
		- 0				- 0	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				Connecting standard J.I.S.			
Nominal diameter Nominal pressure				(DN 50 recommended only for pressure transmitters)			
<u>Connecting standard EN 1092-1</u>				DN 50			
(DN 25, DN 40 and DN 50 recommended only for pressure transmitters)				10 K		2ES	
DN 25				20 K		2ET	
PN 10/16/25/40		0BD		40 K		2EU	
PN 63/100		0BF		10 K		2GS	
PN 160		0BG		20 K		2GT	
PN 250		0BH		40 K		2GU	
DN 40				10 K		2HS	
PN 10/16/25/40		0DD		20 K		2HT	
PN 63/100		0DF		40 K		2HU	
PN 160		0DG		Other version		9AA	H1Y
DN 50				Add Order code and plain text			
PN 10/16/25/40		0ED		Transmitter connection			
PN 63		0EE		Connection via capillary tube			
PN 100		0EF		Length of capillary			
DN 80				1 m		10	
PN 10/16/25/40		0GD		1,6 m		11	
PN 100		0GF		2 m		12	
DN 100				2,5 m		13	
PN 10/16		0HB		3 m		14	
PN 25/40		0HD		4 m		15	
DN 125				5 m		16	
PN 16		0JB		6 m		17	
PN 40		0JD		7 m		18	
<u>Connecting standard ASME B16.5</u>				8 m		20	
(1 inch, 1½ inch and 2 inch recommended only for pressure transmitters)				9 m		21	
1 inch				10 m		22	
class 150		1KL		11 m (only for 7MF0812)		23	
class 300		1KM		12 m (only for 7MF0812)		24	
class 600		1KN		13 m (only for 7MF0812)		25	
class 1500		1KP		14 m (only for 7MF0812)		26	
1½ inch				15 m (only for 7MF0812)		27	
class 150		1LA		Other version		98	L1Y
class 300		1LB		Add Order code and plain text			
class 400/600		1LD		Filling liquid			
class 900/1500		1LF		Silicone oil M5		A	
2 inch				Silicone oil M50		B	
class 150		1MA		High-temperature oil		C	
class 300		1MB		Halocarbon oil		D	
class 400/600		1MD		Food-grade oil (FDA grade)		E	
class 900/1500		1MF		Other version		Z	P1Y
3 inch				Add Order code and plain text			
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					

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Diaphragm seals of flange design with flexible capillary

1

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
- SITRANS P320/P420 transmitter for absolute pressure from differential pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off

7MF0810 -

7MF0811 -

7MF0812 -

- 0

Wetted parts materials

Stainless steel 316L

- Without coating
- With PFA coating
- With PTFE coating
- With ECTFE coating

Monel 400, 2.4360

Hastelloy C276, 2.4819

Tantalum

Titanium, 3.7035

Nickel 201

Diaphragm Duplex, 1.4462

Diaphragm plus flange Duplex, 1.4462

Stainless steel 316L with gold coating

Hastelloy C4, 2.4610

Hastelloy C22, 2.4602

Other version

Add Order code and plain text

A
D
E 0
F
G
J
K
L 0
M 0
Q
R
S 0
U 0
V 0
Z 8 Q 1 Y

Extension length

- without
- 50 mm (2")
- 100 mm (4")
- 150 mm (6")
- 200 mm (8")
- 250 mm (10")

0
1
2
3
4
5
Z 8 Q 1 Y

Other version

Add Order code and plain text

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

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
- SITRANS P320/P420 transmitter for absolute pressure from differential pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off
- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off

7MF0810 -

7MF0811 -

7MF0812 -

- 0

- 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

Pressure Measurement

Remote seals for pressure transmitters

SITRANS P320/P420

Diaphragm seals of flange design with flexible capillary

1

Selection and Ordering data		Article No.	Order code	Selection and Ordering data		Order code
Diaphragm seal				Further designs		
Flange type design, with flexible capillary tube, connected with flexible capillary tube to a				Add "-Z" to Article No. and specify Order code.		
<ul style="list-style-type: none"> 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 -		Factory certificates		
<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for absolute pressure from differential pressure, 7MF03../7MF04.. order separately, Scope of delivery: 1 off 		7MF0811 -		Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	C11	
<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately, Scope of delivery: 2 off 		7MF0812 -		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	
				Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)	C20	
<ul style="list-style-type: none"> Wetted parts Tantalum 				Accessories		
Range	Standard length			Spark arrestor (for gauge and absolute pressure transmitters)	D61	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	K 1		Spark arrestor (for differential pressure and flow transmitters)	D62	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	K 2		Low-temperature version (for Silicon Oil M50 only)	D67	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	K 3		Negative pressure services		
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	K 4		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	

Pressure Measurement

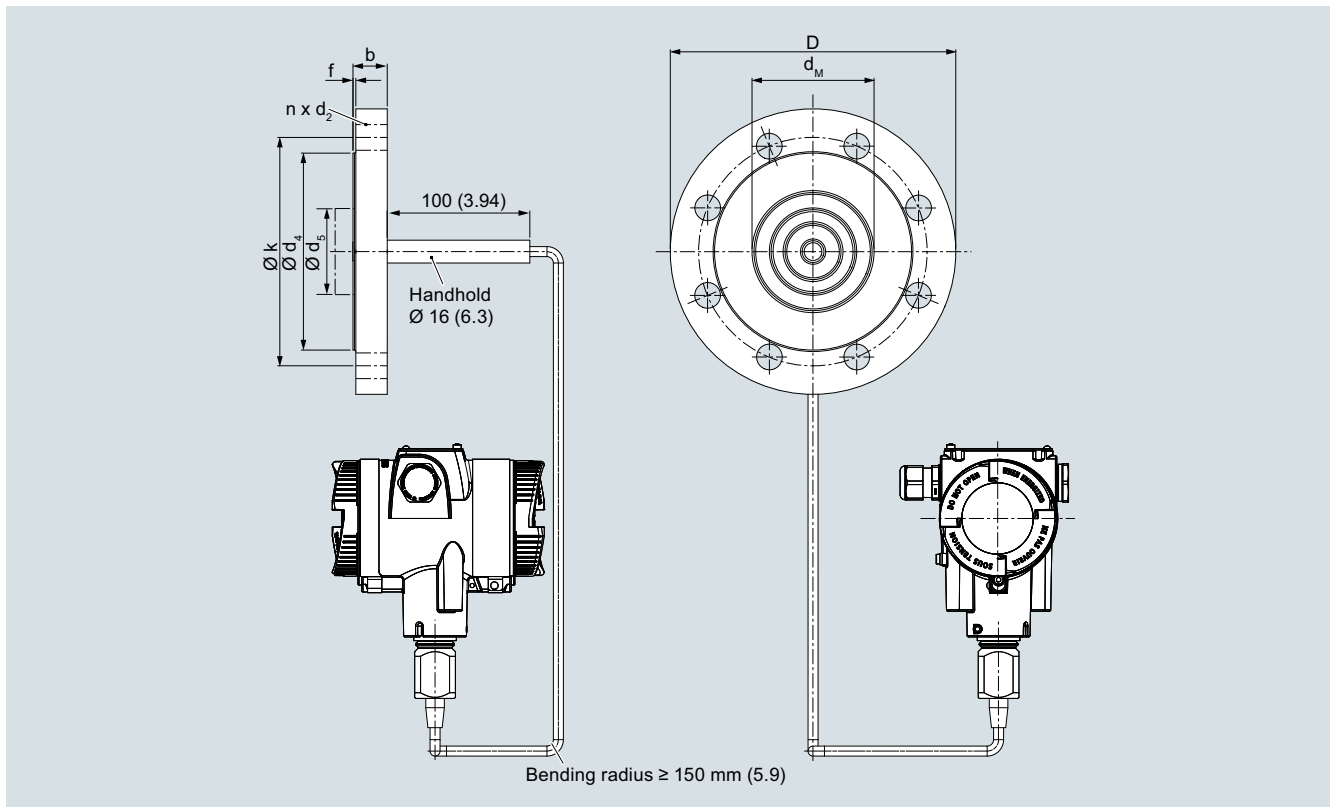
Remote seals for pressure transmitters
SITRANS P320/P420

1

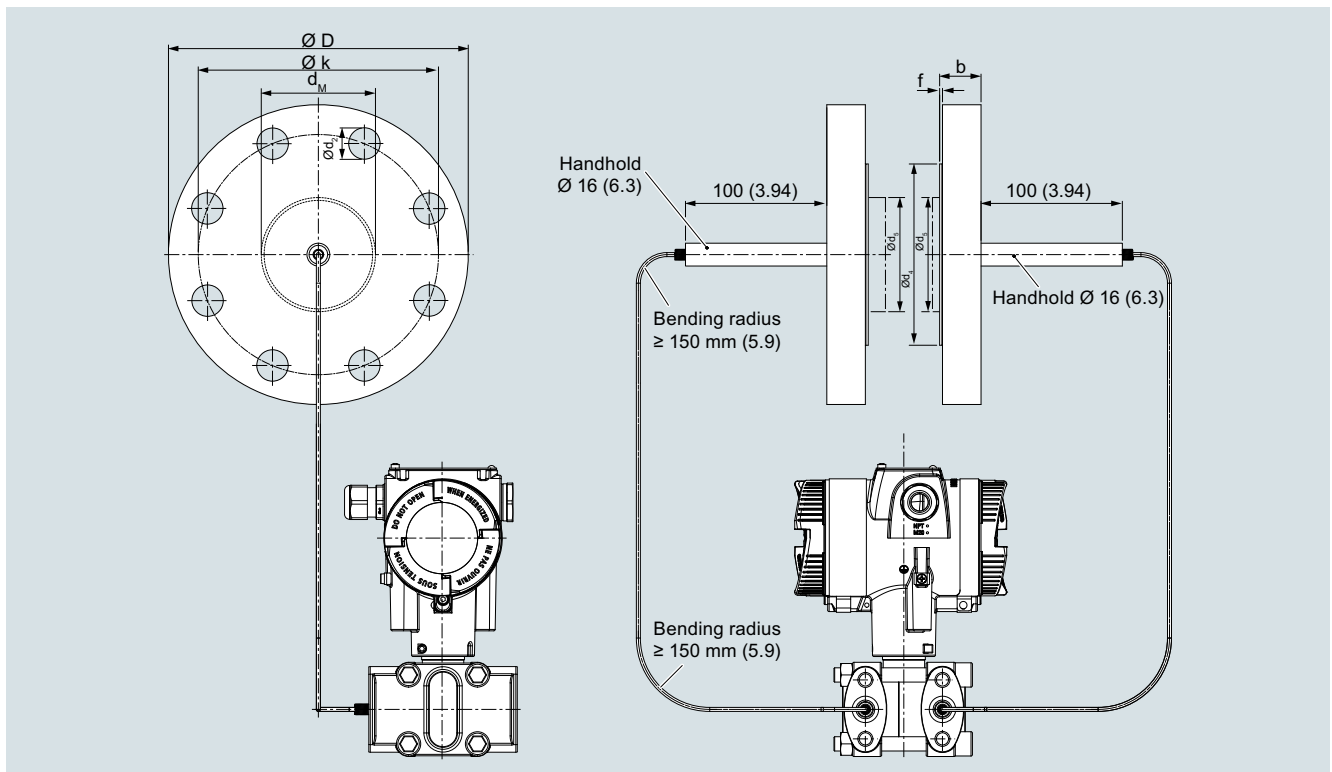
Diaphragm seals of flange design with flexible capillary

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Further designs	
Add "-Z" to Article No. and specify Order code.		Add "-Z" to Article No. and specify Order code.	
Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)		<u>PVC protective tube</u>	
• DN 25	M82	1 m	S70
• DN 40	M83	1,6 m	S71
• DN 50	M84	2 m	S72
• DN 80	M85	2,5 m	S73
• DN 100	M86	3 m	S74
• DN 125	M87	4 m	S75
Capillary connection		5 m	S76
<u>For 7MF0810</u>		6 m	S77
Radial capillary pipe outlet (for single-side mounting and capillary connection only)	S01	7 m	S78
Single-side mounted at differential pressure transmitters at high-side	S03	8 m	S79
Single-side mounted at differential pressure transmitters at low-side	S04	9 m	S80
<u>For 7MF0811</u>		10 m	S81
Radial capillary pipe outlet (for single-side mounting and capillary connection only)	S01	11 m (only for 7MF0802)	S82
<u>For 7MF0812</u>		12 m (only for 7MF0802)	S83
Radial capillary pipe outlet (for double-side mounting)	S02	13 m (only for 7MF0802)	S84
Capillary coating		14 m (only for 7MF0802)	S85
<u>PE protective tube</u>		15 m (only for 7MF0802)	S86
1 m	S10	Customer-specific tube length	
1,6 m	S11	Customer-specific tube length (specify in plain text)	Y44
2 m	S12	Specification of process conditions¹⁾	
2,5 m	S13	Ambient temperature range	
3 m	S14	• -10 ... +50 °C (14 ... +122 °F) preset	D66
4 m	S15	• -40 ... +50 °C (-40 ... +122 °F)	D67
5 m	S16	• -10 ... +85 °C (14 ... +185 °F)	D68
6 m	S17	Process temperature min. ... °C/(°F)/max. ... °C/(°F)	Y50
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		
<u>PTFE protective tube</u>			
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		

¹⁾ See also "Specification of process conditions for selection and ordering data", page 1/338.

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)

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Diaphragm seals of flange design with flexible capillary

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)	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 exten- sion	d _M without exten- sion	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
	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	(0, 2, 3.94, 5.94 oder 7.87)
	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

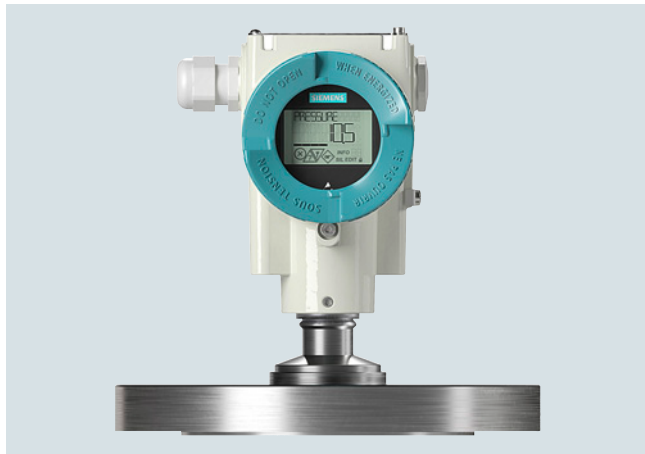
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Diaphragm seals of flange design mounted directly on transmitter

1

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	
<ul style="list-style-type: none"> • DN 25 • DN 40 • DN 50 • DN 80 • DN 100 • DN 125 	PN 10/16/25/40/63/100/160/250 PN 10/16/25/40/63/100/160 PN 10/16/25/40/63/100 PN 10/16/25/40/100 PN 10/16/25/40 PN 16/40
Connecting standard ASME B16.5	
<ul style="list-style-type: none"> • 1 inch • 1½ inch • 2 inch • 3 inch • 4 inch • 5 inch 	Class 150/300/600/1500 Class 150/300/400/600/900/1500 Class 150/300/400/600/900/1500 Class 150/300/600/1500 Class 150/300/400/1500 Class 150/300/400
Connecting standard J.I.S.	
<ul style="list-style-type: none"> • DN 50 • DN 80 • DN 100 	10K 20K 40K
Sealing surface	
<ul style="list-style-type: none"> • For stainless steel, mat. No. 1.4404/316L • For the other materials 	To EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA Smooth to EN 1092-1, form B2 or ASME B16.5 RFSF

Materials

- Main body
- Wetted parts

Stainless steel, 1.4404/316L

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

Stainless steel, 1.4404/316L

Copper

- Capillary

- Sealing material at the transmitter connection

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 O₂)
- Food oil (FDA listed)

Max. recommended process temperature

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)

Pressure Measurement

Remote seals for pressure transmitters

SITRANS P320/P420

Diaphragm seals of flange design mounted directly on transmitter

1

Selection and Ordering data		Article No.	Order code
Diaphragm seal			
Flange type design, directly mounted to a			
<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately 		7MF0810 -	
Scope of delivery: 1 off			
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Nominal diameter	Nominal pressure		
<u>Connecting standard EN 1092-1</u>			
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	
<u>Connecting standard ASME B16.5</u>			
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	
<u>Connecting standard J.I.S.</u>			
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		9AA	H1Y
Add Order code and plain text			
Diaphragm seal			
Flange type design, directly mounted to a			
<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately 		7MF0810 -	
Scope of delivery: 1 off			
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 M5			A
Silicone oil M50			B
High-temperature oil			C
Halocarbon oil			D
Food-grade oil (FDA listed)			E
Other version			Z
Add Order code and plain text			P1Y
Wetted parts materials			
Stainless steel 316L			A
<ul style="list-style-type: none"> Without coating 			D
<ul style="list-style-type: none"> With PFA coating 			E0
<ul style="list-style-type: none"> With PTFE coating 			F
<ul style="list-style-type: none"> With ECTFE coating 			G
Monel 400, 2.4360			J
Hastelloy C276, 2.4819			K
Tantalum			L0
Titanium, 3.7035			M0
Nickel 201			Q
Diaphragm Duplex, 1.4462			R
Diaphragm plus flange Duplex, 1.4462			S0
Stainless steel 316L with gold coating			U0
Hastelloy C4, 2.4610			V0
Hastelloy C22, 2.4602			Z8
Other version			Q1Y
Add Order code and plain text			
Extension length			
<ul style="list-style-type: none"> without 			0
<ul style="list-style-type: none"> 50 mm (2") 			1
<ul style="list-style-type: none"> 100 mm (4") 			2
<ul style="list-style-type: none"> 150 mm (6") 			3
<ul style="list-style-type: none"> 200 mm (8") 			4
<ul style="list-style-type: none"> 250 mm (10") 			5
Other version			Z8
Add Order code and plain text			Q1Y

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Diaphragm seals of flange design mounted directly on transmitter

1

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")
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")

A 1

A 2

A 3

A 4

A 5

- Wetted parts stainless steel with ECTFE coating

Range	Standard length
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")

F 1

F 2

F 3

F 4

F 5

- Wetted parts stainless steel with PFA coating

Range	Standard length
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")

D 1

D 2

D 3

D 4

D 5

- Wetted parts Monel 400

Range	Standard length
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")

G 1

G 2

G 3

G 4

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")
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")

J 1

J 2

J 3

J 4

- Wetted parts Tantalum

Range	Standard length
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")

K 1

K 2

K 3

K 4

Pressure Measurement

Remote seals for pressure transmitters

SITRANS P320/P420

Diaphragm seals of flange design mounted directly on transmitter

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Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Further designs	
Add "-Z" to Article No. and specify Order code.		Add "-Z" to Article No. and specify Order code.	
Factory certificates		Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	C11	• DN 25	M82
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	C12	• DN 40	M83
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	• DN 50	M84
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	C15	• DN 80	M85
Certificate of FDA-approved fill oil (to EN10204-2.2)	C17	• DN 100	M86
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)	C20	• DN 125	M87
Accessories		Capillary connection	
Spark arrestor (for gauge and absolute pressure transmitters)	D61	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
Low-temperature version (for Silicon Oil M50 only)	D67	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
Negative pressure services		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
Negative pressure service (for gauge and absolute pressure transmitters)	D81	Cooling element, max. medium temperature 300 °C (572 °F), observe the max. permissible media temperature of the fill liquid.	S08
Extended negative pressure service (for gauge and absolute pressure transmitters) (only for 7MF0810)	D85	Customer-specific tube length	
General product approvals without explosion proof approvals		Customer-specific tube length (specify in plain text)	Y44
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	Specification of process conditions¹⁾	
Oil-and grease-free cleaned version (not for O ₂ -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)	E87	Ambient temperature range	
Sealing surface		• -10 ... +50 °C (14 ... +122 °F) preset	D66
Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)	M50	• -40 ... +50 °C (-40 ... +122 °F)	D67
Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)	M54	• -10 ... +85 °C (14 ... +185 °F)	D68
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)	M64	Process temperature min. ... °C/(°F)/max. ... °C/(°F)	Y50
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		

¹⁾ See also "Specification of process conditions for selection and ordering data", page 1/338.

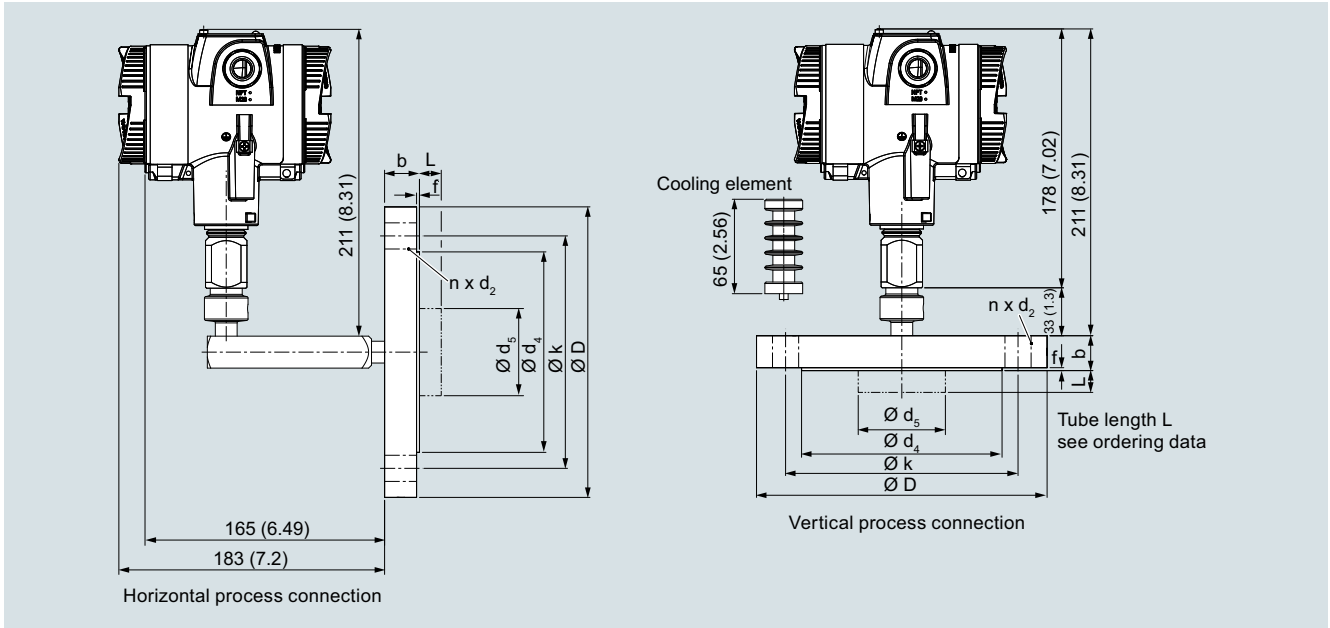
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

1

Diaphragm seals of flange design mounted directly on transmitter

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)

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

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)	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	

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

1

Diaphragm seals of flange design mounted directly on transmitter

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

1

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
- Wetted parts

Stainless steel, 1.4404/316L
 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
 Stainless steel, mat. No. 1.4571/316Ti
 Spiral protective tube made of stainless steel, mat. No. 1.4404/316L

- Capillary

- Sheath

Sealing material in the process flanges

- For pressure transmitters, absolute pressure transmitters and low-pressure applications
- For other applications

Maximum pressure

Tube length

Capillary

- Length

- Internal diameter

- Minimum bending radius

Filling liquid

Max. recommended process temperature

Permissible ambient temperature

Weight

Certificate and approvals

Classification according to pressure equipment directive (DGRL 2014/68/EU)

Copper

Viton

See above and the technical data of the pressure transmitter

Without tube

50 mm (1.97 inch)

100 mm (3.94 inch)

150 mm (5.91 inch)

200 mm (7.87 inch)

Max. 10 m (32.8 ft), longer lengths on request

2 mm (0.079 inch)

150 mm (5.9 inch)

Silicone oil M5

Silicone oil M50

High-temperature oil

Halocarbon oil (for measuring O₂)

Food oil (FDA listed)

170 °C (338 °F)

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

Approx. 4 kg (8.82 lb)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

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

➤ 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	98
Add Order code and plain text	L1Y

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	Z
Add Order code and plain text	P1Y



Pressure Measurement



Remote seals for pressure transmitters

SITRANS P320/P420

Diaphragm seals of flange design mounted directly and with capillary

1

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 • With PFA coating • With PTFE coating • With ECTFE coating Monel 400, 2.4360 Hastelloy C276, 2.4819 Tantalum Titanium, 3.7035 Nickel 201 Diaphragm Duplex, 1.4462 Diaphragm plus flange Duplex, 1.4462 Stainless steel 316L with gold coating Hastelloy C4, 2.4610 Hastelloy C22, 2.4602 Other version Add Order code and plain text		A D E0 F G J K L0 M0 Q R S0 U0 V0 Z8		Q1Y	
Extension length • without • 50 mm (2") • 100 mm (4") • 150 mm (6") • 200 mm (8") • 250 mm (10") Other version Add Order code and plain text		0 1 2 3 4 5 Z8		Q1Y	
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	

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")		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	
• 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	

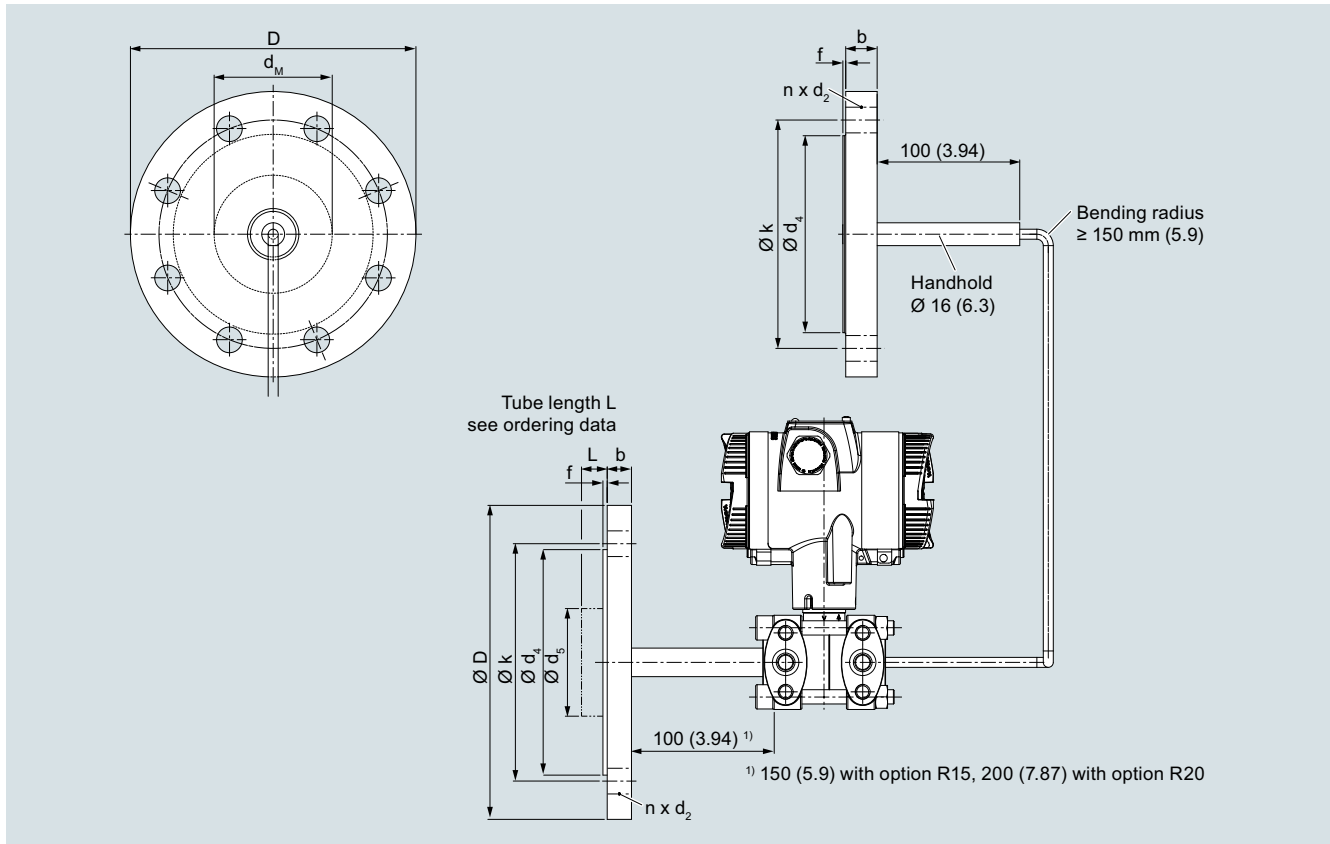
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

1

Diaphragm seals of flange design mounted directly and with capillary

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Further designs	
Add "-Z" to Article No. and specify Order code.		Add "-Z" to Article No. and specify Order code.	
Factory certificates		Capillary coating	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	C11	<u>PE protective tube</u>	
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	C12	1 m	S10
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	1,6 m	S11
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	C15	2 m	S12
Certificate of FDA-approved fill oil (to EN10204-2.2)	C17	2,5 m	S13
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)	C20	3 m	S14
		4 m	S15
		5 m	S16
		6 m	S17
		7 m	S18
		8 m	S19
		9 m	S20
		10 m	S21
		<u>PTFE protective tube</u>	
		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
		<u>PVC protective tube</u>	
		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 conditions¹⁾	
		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 1/338.	
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		

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)

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

1

Diaphragm seals of flange design mounted directly and with capillary

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	

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

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 exten- sion	d _M without exten- sion	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
	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	(0, 2, 3.94, 5.94 oder 7.87)
	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

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

1

Diaphragm seal, screwed design, directly mounted or/and with capillary

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
<ul style="list-style-type: none"> Open flange EN1092-1 <ul style="list-style-type: none"> - DN 15 - DN 20 - DN 25 Open flange ASME B16.5 <ul style="list-style-type: none"> - ½ inch, ¾ inch, 1 inch Thread to EN 837-1 <ul style="list-style-type: none"> - G¼"B, G½"B, G¾"B, G1"B Thread ASME B1.20.1 <ul style="list-style-type: none"> - ¼" NPT-M, ¼" NPT-F - ½" NPT-M, ½" NPT-F - ¾" NPT-M, ¾" NPT-F - 1" NPT-M, 1" NPT-F 	PN 10/16/25/40/63/100/160/250 PN 10/16/25/40 PN 10/16/25/40/63/100/160/250
Sealing surface for open measurement flange	Class 150/300/600/1500
<ul style="list-style-type: none"> For stainless steel, mat. no. 1.4404/316L 	PN 100/250
Materials	
<ul style="list-style-type: none"> Lower section (in the case of process connection thread) Diaphragm 	Stainless steel, Mat. no. 1.4404/316L Stainless steel, Mat. no. 1.4404/316L <ul style="list-style-type: none"> 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
<ul style="list-style-type: none"> Top section (process connection in the case of an open measurement flange) Capillary 	Stainless steel, mat. no. 1.4404/316L Stainless steel 1.4404/316L

<ul style="list-style-type: none"> Sealing material on the process connection Sealing material between top and bottom section 	Viton or copper (in the case of vacuum-free version) Viton (FKM) (standard) Teflon (PTFE) metal spring ring (silver-coated)
Capillary	
<ul style="list-style-type: none"> Length Internal diameter Minimum bending radius Sheath 	Max. 10 m (32.8 ft) 2 mm (0.079 inch) 150 mm (5.9 inch) Stainless steel protective tube, mat. No. 1.4301/304
Filling liquid	<ul style="list-style-type: none"> Silicone oil M5 Silicone oil M50 High-temperature oil Halocarbon oil (for measuring O₂) Food oil (FDA listed)
Max. recommended process temperature	170 °C (338 °F)
Permissible ambient temperature	Dependent on the pressure transmitter and the filling liquid of the remote seal
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

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Pressure Measurement

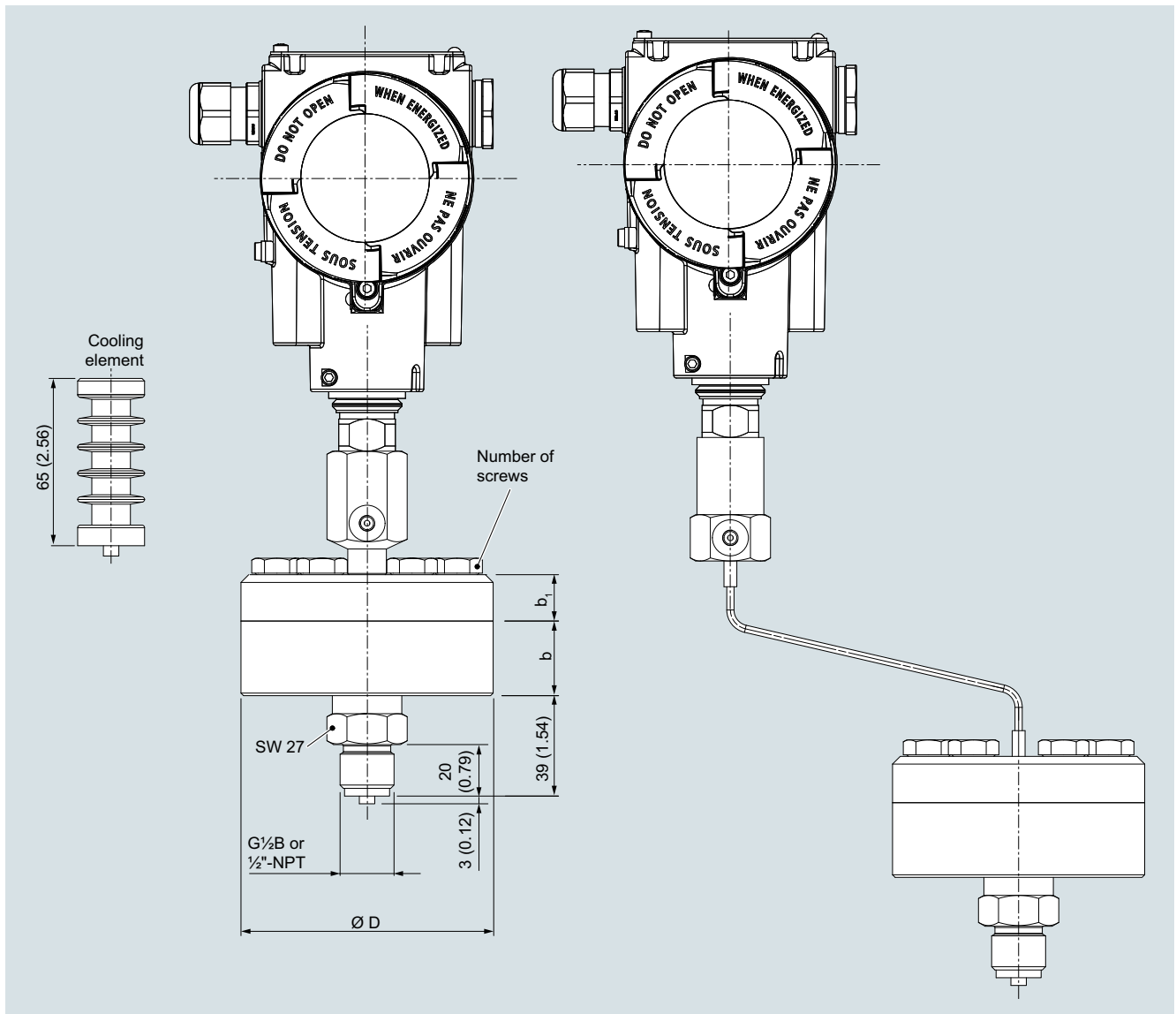
Remote seals for pressure transmitters
SITRANS P320/P420

1

Diaphragm seal, screwed design, directly mounted or/and with capillary

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Further designs	
Add "-Z" to Article No. and specify Order code.		Add "-Z" to Article No. and specify Order code.	
Factory certificates		Capillary coating	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	C11	<u>PE protective tube</u>	
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	C12	1 m	S10
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	1,6 m	S11
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	C15	2 m	S12
Certificate of FDA-approved fill oil (to EN10204-2.2)	C17	2,5 m	S13
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)	C20	3 m	S14
		4 m	S15
		5 m	S16
		6 m	S17
		7 m	S18
		8 m	S19
		9 m	S20
		10 m	S21
		<u>PTFE protective tube</u>	
		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
		<u>PVC protective tube</u>	
		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
Negative pressure services		Customer-specific tube length	
Negative pressure service (for gauge and absolute pressure transmitters)	D81	Customer-specific tube length (specify in plain text)	Y44
Negative pressure service (for differential pressure transmitters)	D83	Specification of process conditions¹⁾	
Extended negative pressure service (for gauge and absolute pressure transmitters)	D85	Ambient temperature range	
Extended negative pressure service (for differential pressure transmitters)	D88	• -10 ... +50 °C (14 ... +122 °F) preset	D66
		• -40 ... +50 °C (-40 ... +122 °F)	D67
		• -10 ... +85 °C (14 ... +185 °F)	D68
General product approvals without explosion proof approvals		Process temperature min. ... °C/(°F)/max. ... °C/(°F)	Y50
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		

¹⁾ See also "Specification of process conditions for selection and ordering data", page 1/338.

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)

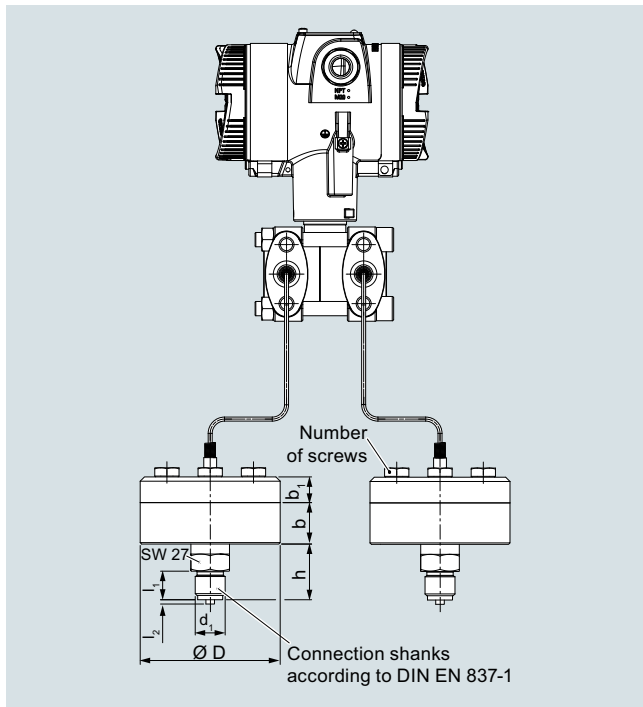
Range	D mm	b mm	b ₁ mm	Number of screws
up to 100 bar	98	14	16	6
up to 250 bar	98	14	20	12

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

1

Diaphragm seal, screwed design, directly mounted or/and with capillary



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

Pressure Measurement

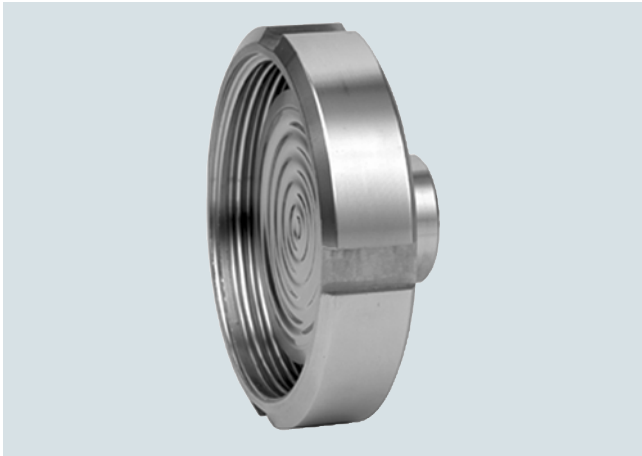
Remote seals for pressure transmitters

SITRANS P320/P420

Quick-release diaphragm seals

1

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 measured medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismantling is possible for cleaning.

Technical specifications

Quick-release diaphragm seal

Connection, nominal diameter	Nominal pressure
<ul style="list-style-type: none"> • Standard to DIN 11851 with nut <ul style="list-style-type: none"> - DN 25/32/40 - DN 50/65/80 • Standard to DIN 11851 with thread <ul style="list-style-type: none"> - DN 25/32/40 - DN 50/65/80 • Standard clamp ISO 2852 <ul style="list-style-type: none"> - DN 25/38/51 - DN 63.5/76.1 	PN 40 PN 25 PN 40 PN 25 PN 16 PN 10

- Standard clamp DIN 32676, row C Tri-clamp
 - 1 inch, 1½ inch
 - 2 inch, 2½ inch
 - 3 inch

PN 25
PN 16
PN 10

- Standard clamp DIN 32676, row A metric
 - DN 25/32/40
 - DN 50
 - DN 65

PN 25
PN 16
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
- Wetted parts
- Capillary

Stainless steel 316L

Stainless steel 316L

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

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Quick-release diaphragm seals

1

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
- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately
Scope of delivery: 1 off

7MF0830 -

7MF0832 -

- 0 A 0

➤ 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	0 BM
DN 32	PN 40	0 CD
DN 40	PN 40	0 DM
DN 50	PN 25	0 EK
DN 65	PN 25	0 FL
DN 80	PN 25	0 GK

Connection standard DIN 11851 with thread

DN 25	PN 40	1 BM
DN 32	PN 40	1 CD
DN 40	PN 40	1 DM
DN 50	PN 25	1 EK
DN 65	PN 25	1 FL
DN 80	PN 25	1 GK

Connection standard Clamp ISO 2852

DN 25	PN 16	2 BK
DN 38	PN 16	2 CQ
DN 51	PN 16	2 FH
DN 63.5	PN 10	2 FJ
DN 76.1	PN 10	2 GJ

Connection standard Clamp DIN 32676, row C Tri-clamp

DN 1"	PN 25	3 KV
DN 1½"	PN 25	3 LV
DN 2"	PN 16	3 MV
DN 2½"	PN 16	3 NV
DN 3"	PN 10	3 PV

Connection standard Clamp DIN 32676, row A metric

DN 25	PN 25	4 BL
DN 32	PN 25	4 CC
DN 40	PN 25	4 DL
DN 50	PN 16	4 EJ
DN 65	PN 10	4 FK

Varivent

DN 25/32	PN 25	5 CL
DN 40/50	PN 25	5 DK

DRD-flange

DN 50	PN 40	6 EM
-------	-------	------

Other version
Add Order code and plain text

9 AA H 1 Y

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
- SITRANS P320/P420 transmitter for differential pressure and flow, 7MF03../7MF04.. order separately
Scope of delivery: 1 off

7MF0830 -

7MF0832 -

- 0 A 0

Transmitter connection

Without capillary tube, direct mount straight connection (for gauge pressure)

Connection via capillary tube

Length of capillary

1 m
1,6 m
2 m
2,5 m
3 m
4 m
5 m
6 m
7 m
8 m
9 m
10 m

Other version

Add Order code and plain text

Filling liquid

Food-grade oil (FDA listed)

Other version

Add Order code and plain text

0 0

1 0

1 1

1 2

1 3

1 4

1 5

1 6

1 7

1 8

2 0

2 1

2 2

9 8

L 1 Y

E

Z

P 1 Y

Pressure Measurement

Remote seals for pressure transmitters

SITRANS P320/P420

Quick-release diaphragm seals

1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Further designs	
Add "-Z" to Article No. and specify Order code.		Add "-Z" to Article No. and specify Order code.	
Factory certificates		<u>PVC protective tube</u>	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	C11	1 m	S70
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	C12	1,6 m	S71
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	C15	2 m	S72
Certificate of FDA-approved fill oil (to EN10204-2.2)	C17	2,5 m	S73
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)	C20	3 m	S74
		4 m	S75
		5 m	S76
		6 m	S77
		7 m	S78
		8 m	S79
		9 m	S80
		10 m	S81
Negative pressure services		Customer-specific tube length	
Negative pressure service (for gauge and absolute pressure transmitters)	D81	Customer-specific tube length (specify in plain text)	Y44
Negative pressure service (for differential pressure transmitters)	D83	Specification of process conditions¹⁾	
Extended negative pressure service (for gauge and absolute pressure transmitters)	D85	Ambient temperature range	
Extended negative pressure service (for differential pressure transmitters)	D88	• -10 ... +50 °C (14 ... +122 °F) preset	D66
		• -40 ... +50 °C (-40 ... +122 °F)	D67
		• -10 ... +85 °C (14 ... +185 °F)	D68
Capillary connection (only for 7MF0830)		Process temperature min. ... °C/(°F)/max. ... °C/(°F)	Y50
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			
<u>PE protective tube</u>			
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		
<u>PTFE protective tube</u>			
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		

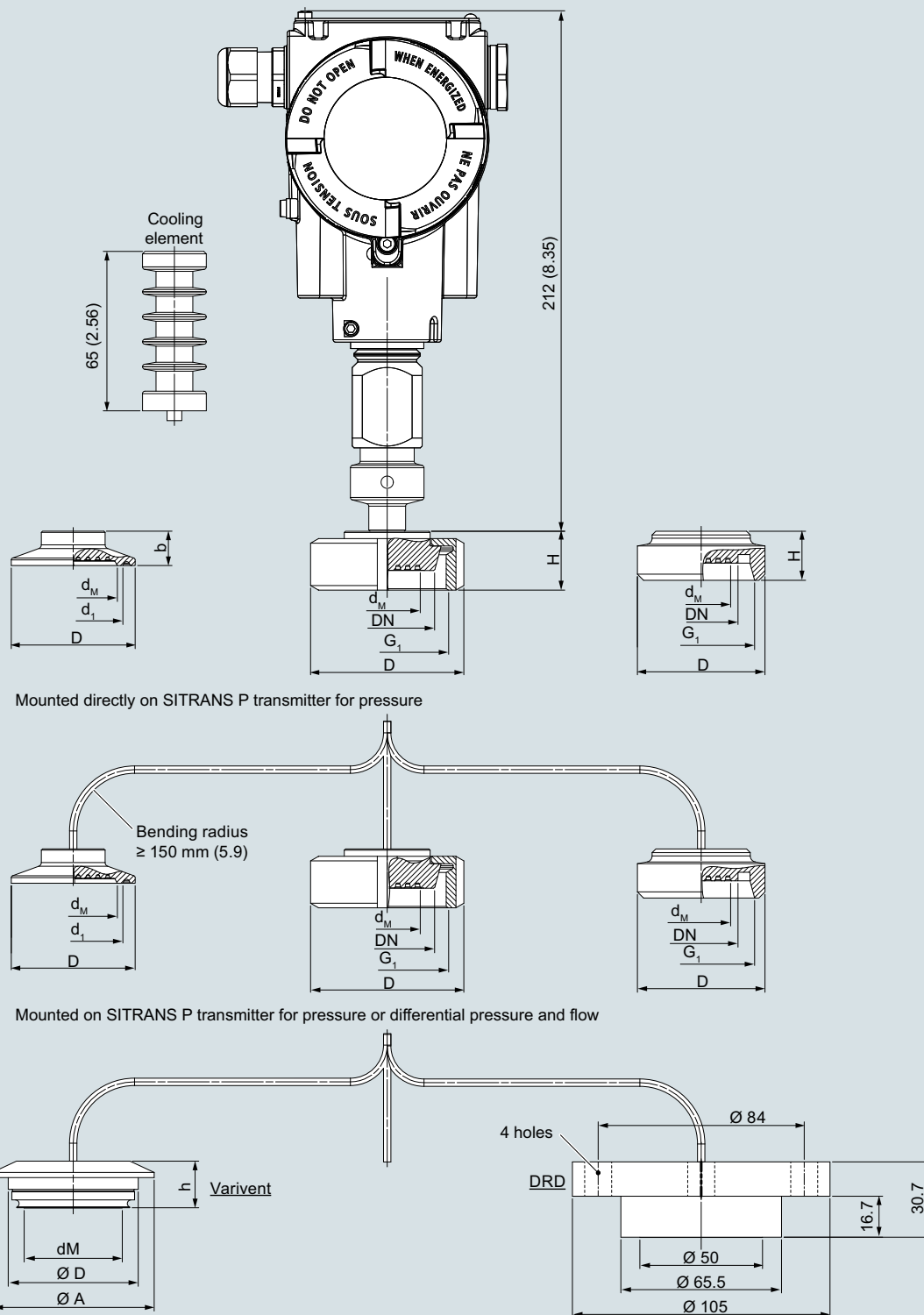
¹⁾ See also "Specification of process conditions for selection and ordering data", page 1/338.

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Quick-release diaphragm seals

Dimensional drawings



Quick-release diaphragm seal, dimensions in mm (inch)

Pressure Measurement

Remote seals for pressure transmitters

SITRANS P320/P420

Quick-release diaphragm seals

1

Connection to DIN 11851 with slotted union nut

Nominal diameter	Ø d _M mm	Ø D mm	H mm	G ₁ 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 mm	H mm	G ₁ 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 mm	d ₁ mm	b mm	D 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 mm (inch)	d ₁ mm (inch)	b mm (inch)	D 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 mm	d ₁ mm	b mm	D 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 mm (inch)	A mm (inch)	D mm (inch)	h 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)

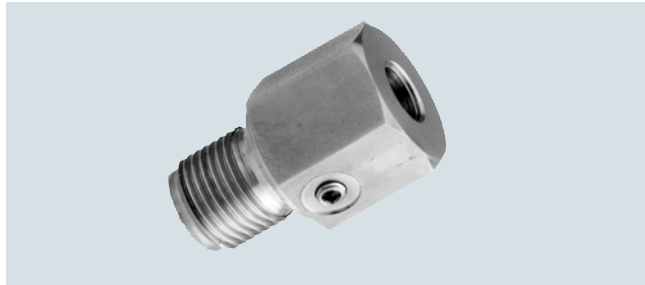
d_M Effective diaphragm diameter

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Miniature diaphragm seals

Overview



Miniature diaphragm seals

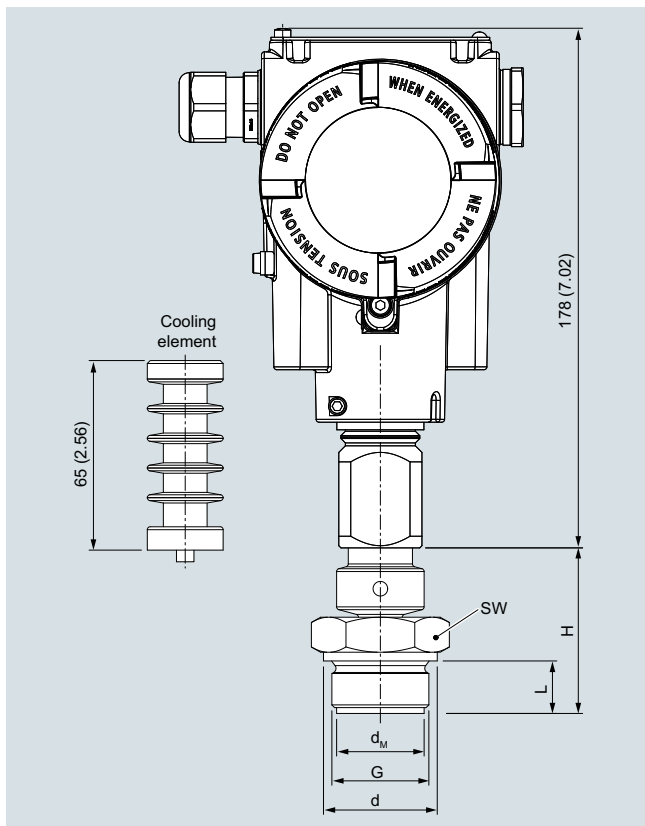
The miniature diaphragm seals are available for the SITRANS P320/420 pressure transmitter series.

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)
G1B	25	(0.98)	41	(1.61)	39	(1.53)	28	(1.1)
G1½B	40	(1.57)	55	(2.17)	60	(2.36)	30	(1.18)
G2B	50	(1.97)	60	(2.36)	70	(2.76)	30	(1.18)

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

Span with	
• 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 process temperature	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)

Pressure Measurement

Remote seals for pressure transmitters

SITRANS P320/P420

Miniature diaphragm seals

1

Selection and Ordering data		Article No.	Order code	Selection and Ordering data		Order code
Miniature diaphragm seal				Further designs		
directly connected to a				Add "-Z" to Article No. and specify Order code.		
<ul style="list-style-type: none"> 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 -		Factory certificates		
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		00 - 00		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
				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 conditions¹⁾		
				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 1/338.		
Process connection						
Connection standard DIN 3852						
G 1/2"	PN 400	4 ST				
G 3/4"	PN 400	4 SU				
G 1"	PN 400	4 SV				
G 1 1/2"	PN 400	4 SW				
G 2"	PN 400	4 SX				
Connection standard ASME B1.20.1						
1/2"-NPT-M	class 5800	5 TS				
3/4"-NPT-M	class 5800	5 TT				
1"-NPT-M	class 5800	5 TU				
1 1/2"-NPT-M	class 5800	5 TV				
2"-NPT-M	class 5800	5 TW				
Other version		9 AA	H 1 Y			
Add Order code and plain text						
Filling liquid						
Silicone oil M5			A			
Food-grade oil (FDA listed)			E			
Other version			Z			P 1 Y
Add Order code and plain text						
Wetted parts material						
Stainless steel 316L without coating			A			
Hastelloy C276, 2.4819			J			

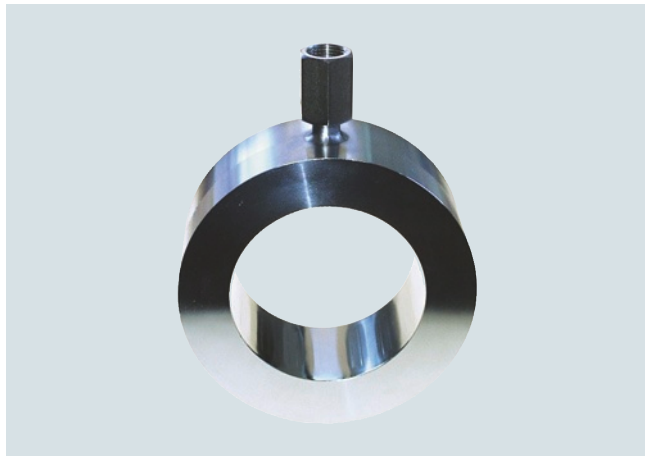
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Inline seals in sandwich design

1

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 remote 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	PN 6 ... PN 100
• DN 25/40/50/65/80/100/125	
Connecting standard ASME B16.5	Class 150 ... class 2500
• 1, 1½, 2, 2½, 3, 4, 5 inch	Flange to EN 1092-1 or ASME B 16.5
Process connection	<ul style="list-style-type: none"> • 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
Sealing surface	
Materials	
• Main body	Stainless steel 1.4404/316L
• Diaphragm	Stainless steel 1.4404/316L
• Wetted parts	Stainless steel 1.4404/316L
	<ul style="list-style-type: none"> • 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



Pressure Measurement

Remote seals for pressure transmitters

SITRANS P320/P420

Inline seals in sandwich design

1

Selection and Ordering data		Article No.	Order code
Inline-diaphragm seal			
Sandwich type design, directly connected or connected with flexible capillary tube to a			
<ul style="list-style-type: none"> 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 -	
<ul style="list-style-type: none"> 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-diaphragm seal			
Sandwich type design, directly connected or connected with flexible capillary tube to a			
<ul style="list-style-type: none"> 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 -	
<ul style="list-style-type: none"> 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 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		Z	P1Y
Wetted parts materials			
Stainless steel 316L		A	
<ul style="list-style-type: none"> Without coating 		D	
<ul style="list-style-type: none"> With PFA coating 		F	
<ul style="list-style-type: none"> With ECTFFE coating 		G	
Monel 400, 2.4360		J	
Hastelloy C276, 2.4819		K	
Tantalum		U	
Hastelloy C4, 2.4610		Z	Q1Y
Other version Add Order code and plain text			

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Inline seals in sandwich design

1

Selection and Ordering data		Order code	Selection and Ordering data		Order code
Further designs			Further designs		
Add "-Z" to Article No. and specify Order code.			Add "-Z" to Article No. and specify Order code.		
Factory certificates			Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)		
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2		C11	• DN 25		M82
Inspection certificate to EN 10204-3.1 - material of body and wetted parts		C12	• DN 40		M83
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	• DN 50		M84
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts		C15	• DN 80		M85
Certificate of FDA-approved fill oil (to EN10204-2.2)		C17	• DN 100		M86
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)		C20	• DN 125		M87
Accessories			Capillary connection		
Spark arrestor (for gauge and absolute pressure transmitters)		D61	For 7MF0900		
Spark arrestor (for differential pressure and level transmitters)		D62	Single-side mounted at differential pressure transmitters at high-side		S03
Low-temperature version (for Silicon Oil M50 only)		D67	Single-side mounted at differential pressure transmitters at low-side		S04
Negative pressure services			cooling element		S08
Negative pressure service (for gauge and absolute pressure transmitters)		D81	Capillary coating		
Negative pressure service (for differential pressure transmitters)		D83	<u>PE protective tube</u>		
Extended negative pressure service (for gauge and absolute pressure transmitters)		D85	1 m		S10
Extended negative pressure service (for differential pressure transmitters)		D88	1,6 m		S11
General product approvals without explosion proof approvals			2 m		S12
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	2,5 m		S13
Oil-and grease-free cleaned version (not for O ₂ -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)		E87	3 m		S14
Sealing surface			4 m		S15
Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)		M50	5 m		S16
Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)		M54	6 m		S17
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)		M64	7 m		S18
Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)			8 m		S19
• DN 25		M70	9 m		S20
• DN 40		M71	10 m		S21
• DN 50		M72	11 m (only for 7MF0902)		S22
• DN 80		M73	12 m (only for 7MF0902)		S23
• DN 100		M74	13 m (only for 7MF0902)		S24
• DN 125		M75	14 m (only for 7MF0902)		S25
Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)			15 m (only for 7MF0902)		S26
• DN 25		M76	<u>PTFE protective tube</u>		
• DN 40		M77	1 m		S40
• DN 50		M78	1,6 m		S41
• DN 80		M79	2 m		S42
• DN 100		M80	2,5 m		S43
• DN 125		M81	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

Selection and Ordering data	Order code
Further designs	
Add "-Z" to Article No. and specify Order code.	
<u>PVC protective tube</u>	
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 conditions¹⁾	
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

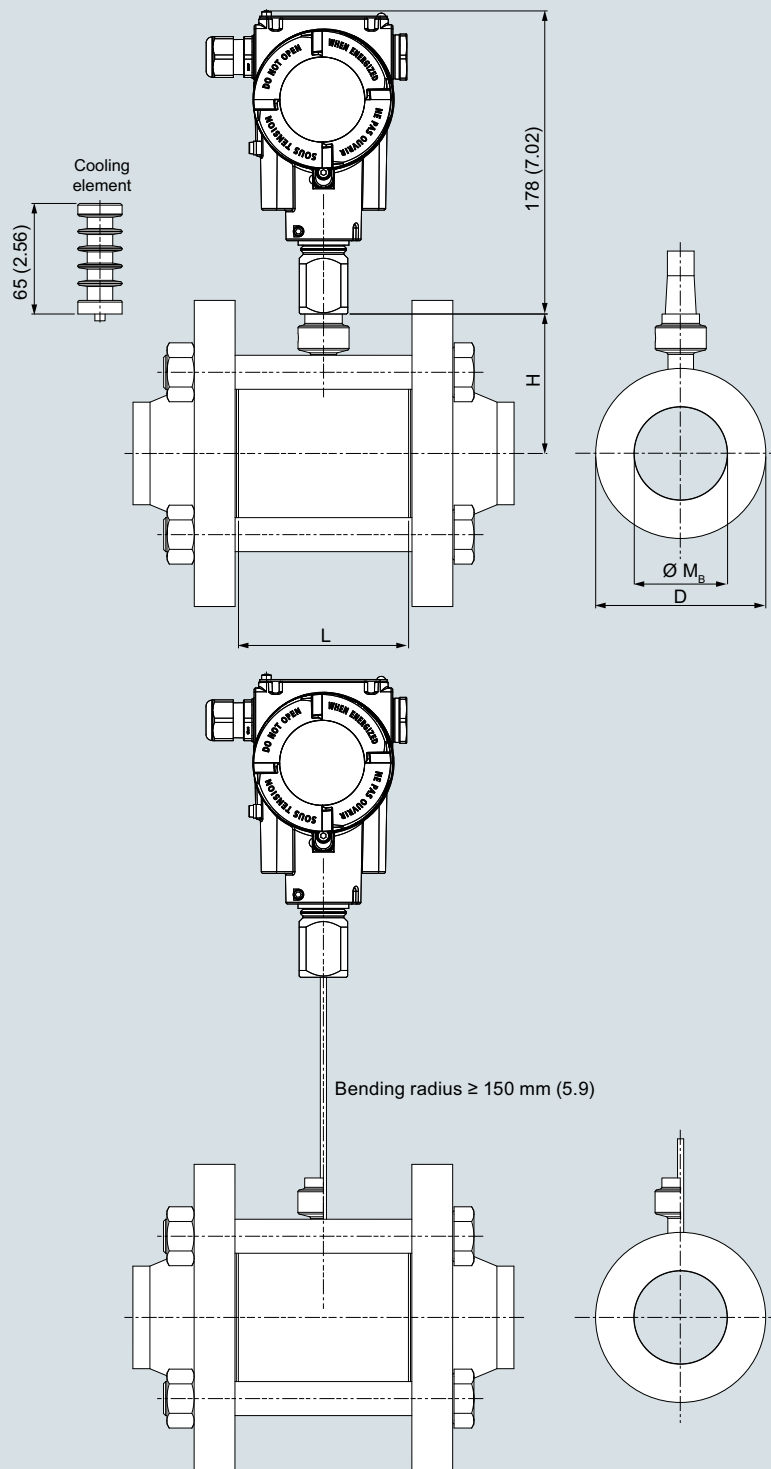
¹⁾ See also "Specification of process conditions for selection and ordering data", page 1/338.

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Inline seals in sandwich design

Dimensional drawings



Inline seal for flange-mounting, connected to SITRANS P pressure transmitter, dimensions in mm (inch)

Connection to EN 1092-1

DN mm	PN bar	D mm	Mb mm	L mm	H 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 (inch)	Class	D mm (inch)	Mb mm (inch)	L mm (inch)	H 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)

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Quick-release inline seals

1

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 media and high-viscosity media. Since it is completely integrated in the process pipe, no turbulences, dead volumes or other obstructions to the flow occur. The measured medium flows unhindered through the inline seal and results in self-cleaning of the measuring chamber. Furthermore, the inline seal can be cleaned by a pig.

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

Inline seals of quick-release design for pressure		
Connection	Nominal diameter	Nominal pressure
<ul style="list-style-type: none">• Standard to DIN 11851 with thread• Standard Clamp ISO 2852• Standard Clamp DIN 32676, row C Tri-clamp• Standard Clamp DIN 32676, row A metric	DN 25/32/40	PN 40
	DN 50/65/80	PN 25
	DN 25/38/51	PN 16
	DN 63.5/76.1	PN 10
	1, 1½ inch	PN 25
	2, 2½ inch	PN 16
	3 inch	PN 10
	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	

Pressure Measurement

Remote seals for pressure transmitters

SITRANS P320/P420

Quick-release inline seals

1

Selection and Ordering data		Article No.	Order code
Quick release inline-seal			
Flange type design, with flexible capillary tube or directly connected to a			
<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately 		7MF0930 -	
Scope of delivery: 1 off			
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	1 BM	
DN 32	PN 40	1 CD	
DN 40	PN 40	1 DM	
DN 50	PN 25	1 EK	
DN 65	PN 25	1 FL	
DN 80	PN 25	1 GK	
Connection standard Clamp ISO 2852			
DN 25	PN 16	2 BK	
DN 38	PN 16	2 CQ	
DN 51	PN 16	2 FH	
DN 63,5	PN 10	2 FJ	
DN 76,1	PN 10	2 GJ	
Connection standard Clamp DIN 32676, row C Tri-clamp			
DN 1"	PN 25	3 KV	
DN 1½"	PN 25	3 LV	
DN 2"	PN 16	3 MV	
DN 2½"	PN 16	3 NV	
DN 3"	PN 10	3 PV	
Connection standard Clamp DIN 32676, row A metric			
DN 25	PN 25	4 BL	
DN 32	PN 25	4 CC	
DN 40	PN 25	4 DL	
DN 50	PN 16	4 EJ	
DN 65	PN 10	4 FK	
Other version		9 AA	H 1 Y
Add Order code and plain text			
Selection and Ordering data		Article No.	Order code
Quick release inline-seal			
Flange type design, with flexible capillary tube or directly connected to a			
<ul style="list-style-type: none"> SITRANS P320/P420 transmitter for gauge pressure or absolute pressure (only together with negative pressure service), 7MF03../7MF04.. order separately 		7MF0930 -	
Scope of delivery: 1 off			
Transmitter connection			
Without capillary tube, direct mount straight connection (for gauge pressure)		0 0	
Connection via capillary tube			
Length of capillary			
1 m		1 0	
1,6 m		1 1	
2 m		1 2	
2,5 m		1 3	
3 m		1 4	
4 m		1 5	
5 m		1 6	
6 m		1 7	
7 m		1 8	
8 m		2 0	
9 m		2 1	
10 m		2 2	
Other version		9 8	L 1 Y
Add Order code and plain text			
Filling liquid			
Food-grade oil (FDA listed)		E	
Other version		Z	P 1 Y
Add Order code and plain text			

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

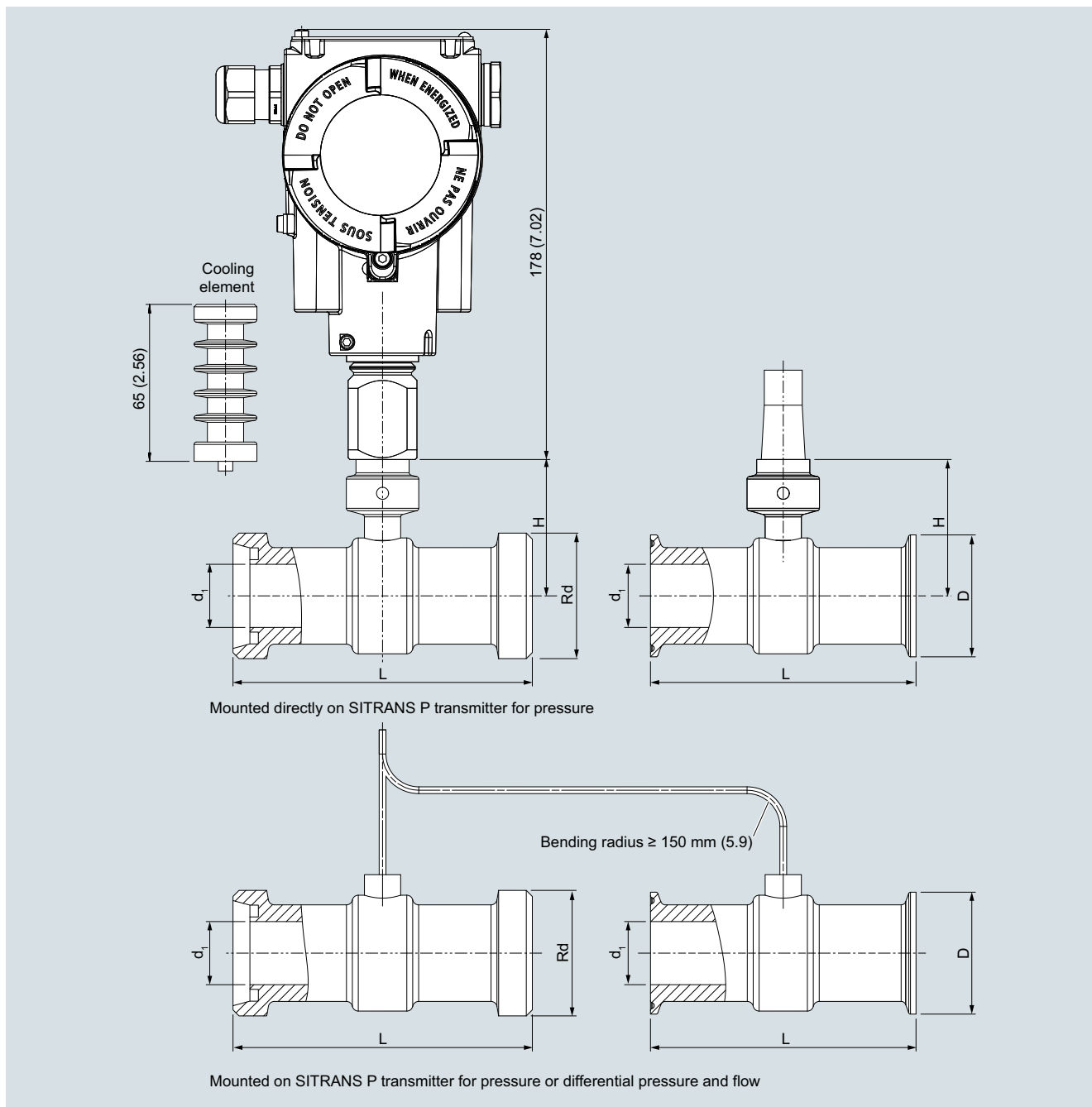
Quick-release inline seals

1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Further designs	
Add "-Z" to Article No. and specify Order code.		Add "-Z" to Article No. and specify Order code.	
Factory certificates		PVC protective tube	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	C11	1 m	S70
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	C12	1,6 m	S71
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	C15	2 m	S72
Certificate of FDA-approved fill oil (to EN10204-2.2)	C17	2,5 m	S73
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)	C20	3 m	S74
		4 m	S75
		5 m	S76
		6 m	S77
		7 m	S78
		8 m	S79
		9 m	S80
		10 m	S81
Negative pressure services		Customer-specific tube length	
Negative pressure service (for gauge and absolute pressure transmitters)	D81	Customer-specific tube length (specify in plain text)	Y44
Extended negative pressure service (for gauge and absolute pressure transmitters)	D85		
Capillary connection		Specification of process conditions¹⁾	
Single-side mounted at differential pressure transmitters at high-side	S03	Ambient temperature range	
Single-side mounted at differential pressure transmitters at low-side	S04	• -10 ... +50 °C (14 ... +122 °F) preset	D66
cooling element	S08	• -40 ... +50 °C (-40 ... +122 °F)	D67
		• -10 ... +85 °C (14 ... +185 °F)	D68
		Process temperature min. ... °C/(°F)/max. ... °C/(°F)	Y50
Capillary coating			
<u>PE protective tube</u>			
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		
<u>PTFE protective tube</u>			
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		

¹⁾ See also "Specification of process conditions for selection and ordering data", page 1/338.

Dimensional drawings



Quick-release inline seal, dimensions in mm (inch)

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

1

Quick-release inline seals

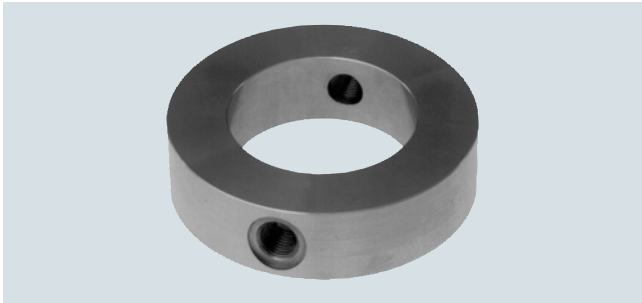
Clamp-on seals for pipes to EN 10357 (DIN 11851)

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

Clamp-on seals for pipes to BS 4825 Part 3 and O.D. Tube (suited for pipes 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	PN 40	37 x 3.175	PN 16	50.5
1½ inch	38 mm	110	34.8	PN 40	50 x 3.175	PN 16	50.5
2 inch	51 mm	110	47.8	PN 25	64 x 3.175	PN 16	64
1½ inch	63.5 mm	110	60.3	PN 25	77.5 x 3.175	PN 16	77.5
3 inch	76.1 mm	60	72.9	PN 25	91 x 3.175	PN 10	91
4 inch	101.6 mm	60	97.6	PN 25	118 x 3.175	PN 10	119

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

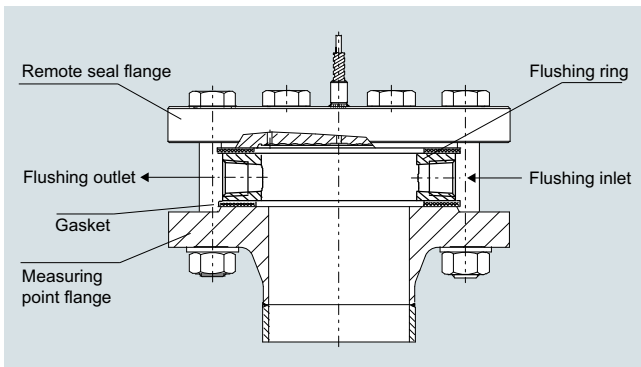
Material: CrNi-Stahl, mat. No. 1.4404/316L
Sealing faces and flushing holes: See Selection and Ordering data

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
	• G $\frac{1}{4}$
	• G $\frac{1}{2}$
	• $\frac{1}{4}$ -18 NPT
	• $\frac{1}{2}$ -14 NPT
	Stainless steel 1.4404/316L
Flushing holes (2 off), female thread	
Material	

Design



Installation example

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Flushing rings for diaphragm seals

1

Selection and Ordering data

Article No.Ord. code

Flushing ring

7MF4925 -

for remote seals 7MF0800 to 7MF0814

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

Nom. diam.

- 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 ... 600
- 3 inch Class 150 ... 600
- 4 inch Class 150 ... 600
- 5 inch Class 150 ... 600

Nom. press.

A
B
C
D
G
H
J
K

Only for RJF ring groove, 7MF4925-1*R....:

- 2 inch Class 150
- 3 inch Class 150
- 4 inch Class 150
- 5 inch Class 150
- 2 inch Class 300 ... 600
- 3 inch Class 300 ... 600
- 4 inch Class 300 ... 600
- 5 inch Class 300 ... 600

NR
PR
QR
RR
UR
VR
WR
XR

Other version

Add Order code and plain text:

Nominal diameter: ...; Nominal pressure: ...

Z

J 1 Y

Sealing surface

- EN 1092-1
 - Form B1
 - Form B2
 - Form C/Form C
 - Form D/Form C
 - Form D/Form D
- Form E
- Form F
- ASME B16.5
 - RF 125 ... 250 AA
 - RFSF
 - RJF ring groove

A
C
D
E
F
G
H
M
Q
R
Z

Other version

Add Order code and plain text:

Sealing surface: ...

K 1 Y

Flushing holes (2 off)

- Female thread G $\frac{1}{4}$
- Female thread G $\frac{1}{2}$
- Female thread $\frac{1}{4}$ -18 NPT
- Female thread $\frac{1}{2}$ -14 NPT

1
2
3
4

Material

- Stainless steel 316L

Other version

Add Order code and plain text:

Material: ...

0
9

M 1 Y

Further designs

Please add "-Z" to Article No. and specify Order code.

Order code

Inspection certificate

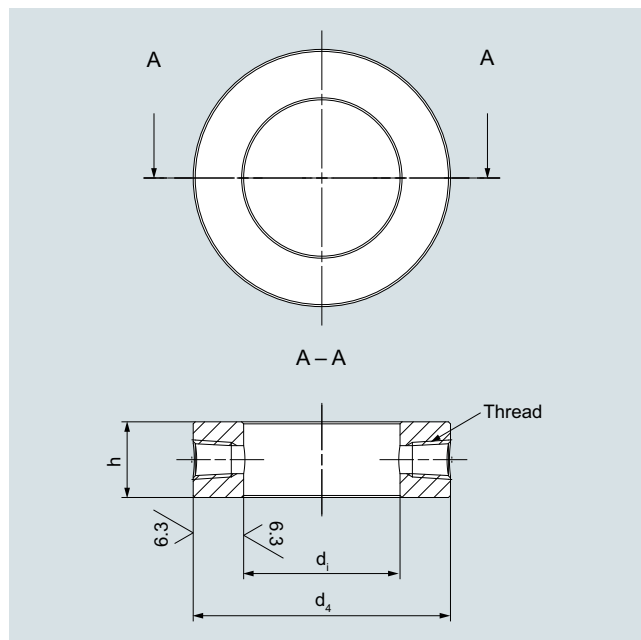
to EN 10204, section 3.1

C12

Dimensional drawings

Connection according to EN 1092-1

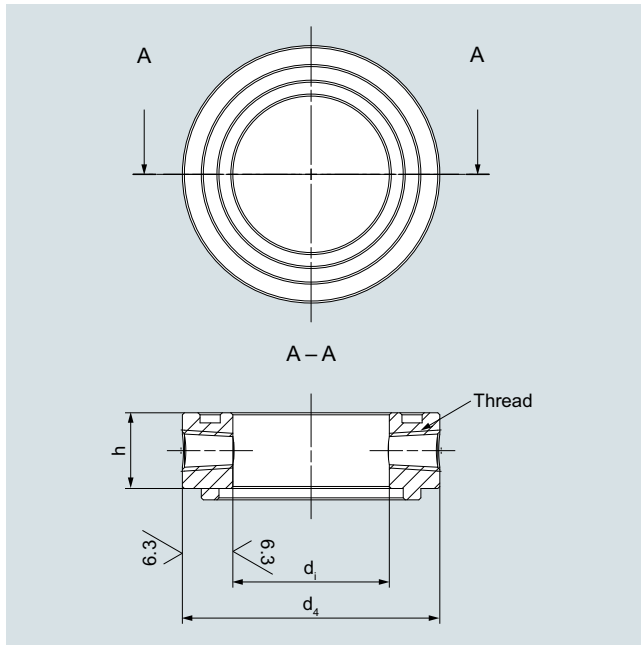
Form B1 and form B2



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)

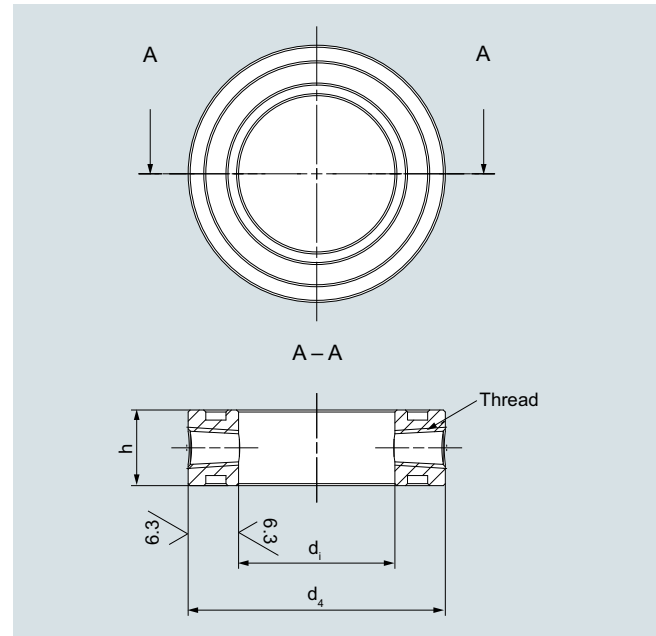
Form D/form C



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)

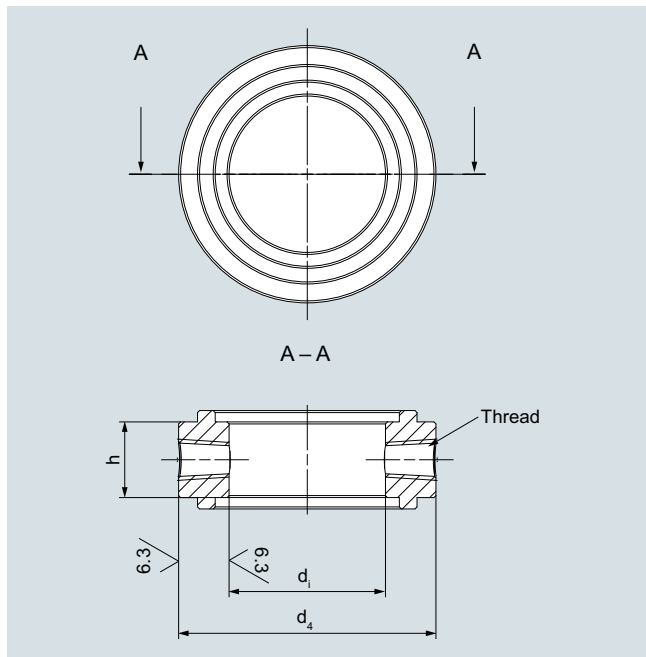
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

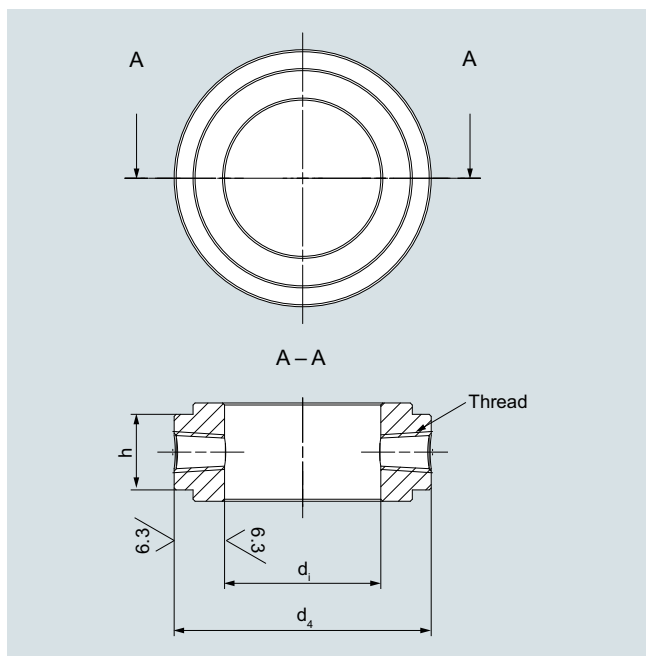
1

Flushing rings for diaphragm seals

Form C/form C and form E



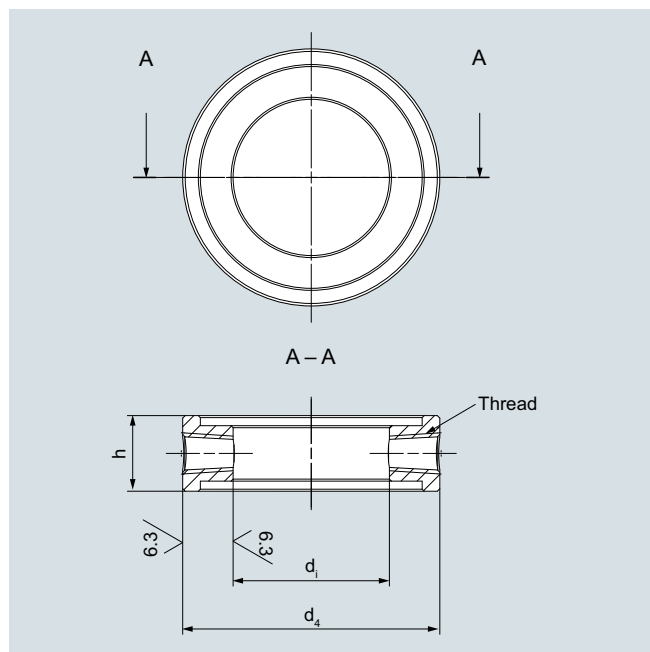
Flushing ring; sealing surface (EN 1092-1), form C/form C



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

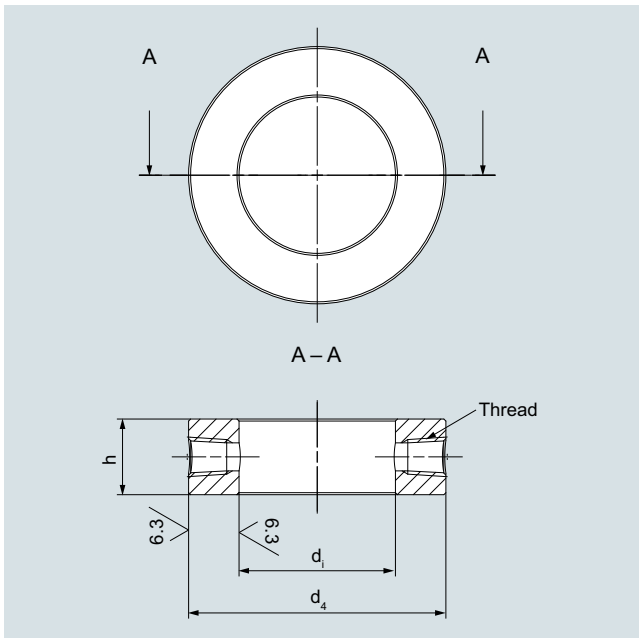


Flushing ring; sealing surface (EN 1092-1), form F

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)

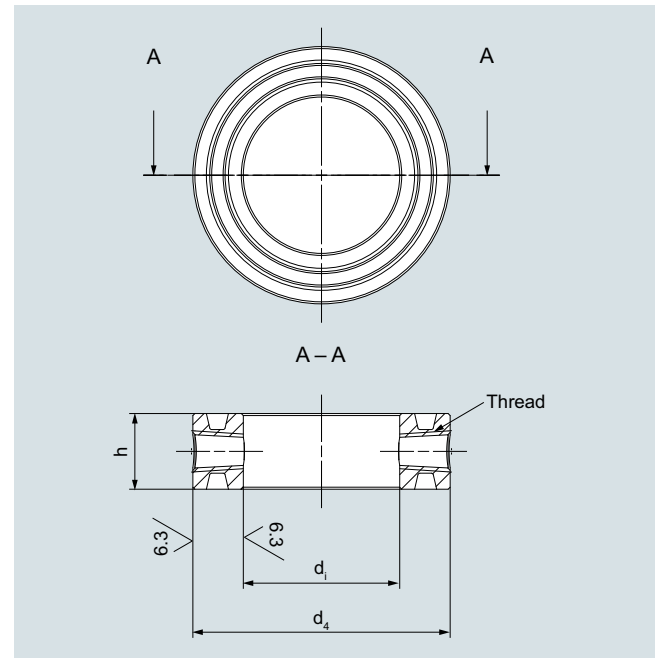
Connection according to ASME B 16.5

RFSF and RF 125 ... 250 AA



Flushing ring; sealing surface (ASME B 16.5), RFSF and RF 125 to 250 AA

DN inch	Class	Thread	d ₄ Ø in mm (inch)	d _i Ø in mm (inch)	h Ø in mm (inch)	Weight 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 inch	Class	Thread	d ₄ Ø in mm (inch)	d _i Ø in mm (inch)	h Ø in mm (inch)	Weight 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)

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

Measuring setups

1

Overview

This section shows examples of typical measuring setups for using SITRANS P pressure transmitters with and without remote seals.

Equations for calculating start of scale and full scale 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 start-of-scale and full-scale values 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-... 7MF033-... 7MF043-...	7MF0800-... 7MF0810-... (negative pressure service in each case) 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

$H_1 \leq 7 \text{ m (23 ft)}$, with halocarbon oil as filling liquid only $H_1 \leq 4 \text{ m (13.1 ft)}$

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 C₁

Installation type C₂

Pressure transmitter for absolute pressure always below the measuring point: $H_1 \geq 200 \text{ mm (7.9 inch)}$

Installation type C₁ and C₂

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)

Overview

Notes

- For the separation layer measurement, the separation layer has to be positioned between the two spigots.

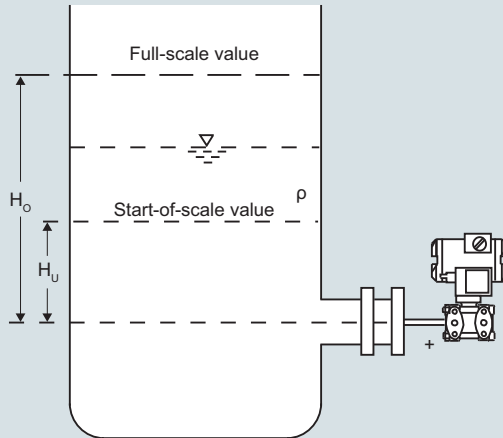
Also you must make sure that the level in the container is always above the top spigot.

- 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



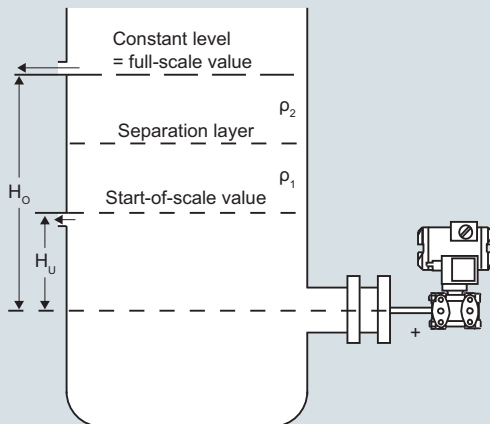
Level measurement

$$\text{Start-of-scale: } p_{MA} = \rho \cdot g \cdot H_U$$

$$\text{Full-scale: } p_{ME} = \rho \cdot g \cdot H_O$$

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



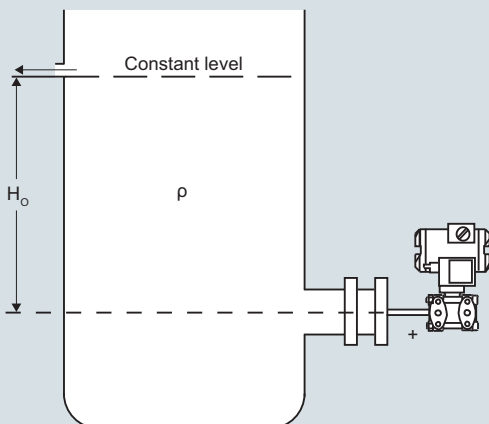
Separation layer measurement

$$\text{Start-of-scale: } p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2)$$

$$\text{Full-scale: } p_{ME} = \rho_1 \cdot g \cdot H_O$$

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

$$\text{Start-of-scale: } p_{MA} = \rho_{MIN} \cdot g \cdot H_O$$

$$\text{Full-scale: } p_{ME} = \rho_{MAX} \cdot g \cdot H_O$$

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

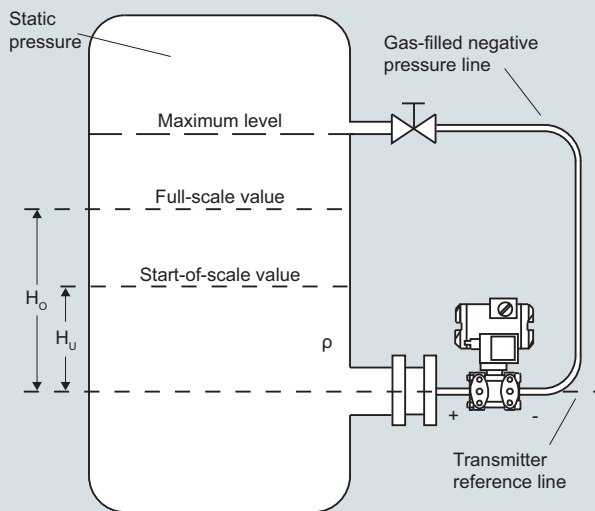
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P320/P420

1

Measuring setups without remote seals

Measuring setups for closed containers



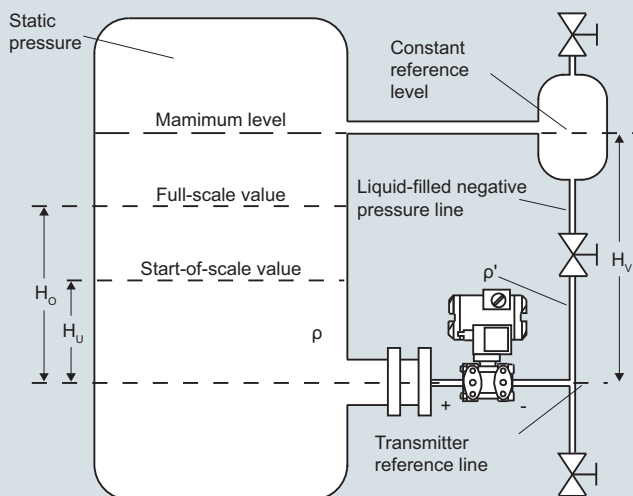
Level measurement, Version 1

$$\text{Start-of-scale: } \Delta p_{MA} = \rho \cdot g \cdot H_U$$

$$\text{Full-scale: } \Delta p_{ME} = \rho \cdot g \cdot H_O$$

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



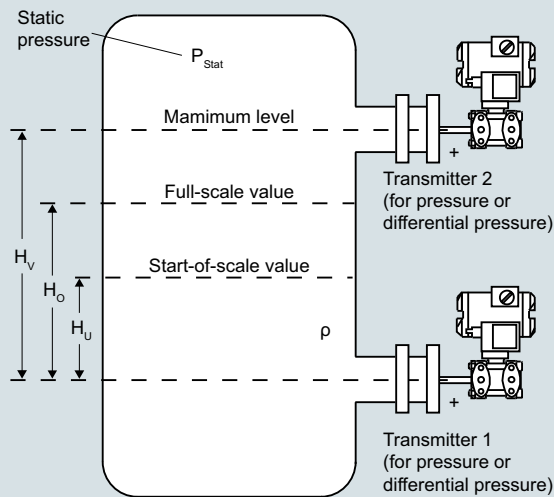
Level measurement, Version 2

$$\text{Start-of-scale: } \Delta p_{MA} = g \cdot (H_U \cdot \rho - H_V \cdot \rho')$$

$$\text{Full-scale: } \Delta p_{ME} = g \cdot (H_O \cdot \rho - H_V \cdot \rho')$$

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)



Level measurement, Version 3

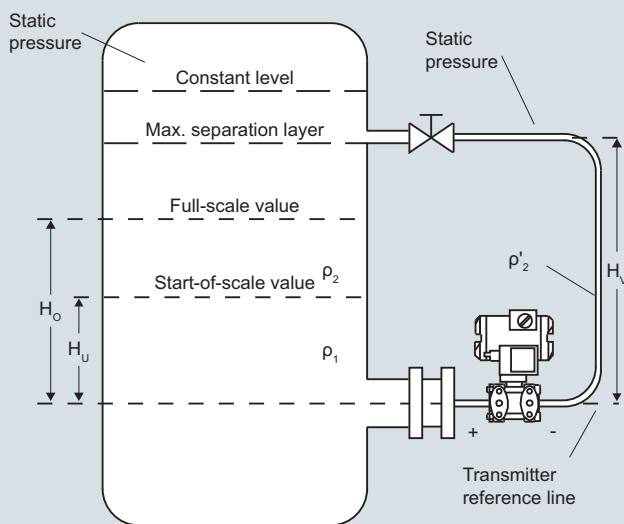
$$\text{Start-of-scale: } \Delta p_{MA} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_U}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$$

$$\text{Full-scale: } \Delta p_{ME} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_O}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$$

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
H_V	Distance between the measuring points (spigots)

The pressure measuring range (\pm 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

$$\text{Start-of-scale: } \Delta p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2 - H_V \cdot \rho'_2)$$

$$\text{Full-scale: } \Delta p_{ME} = g \cdot (H_O \cdot \rho_1 - H_V \cdot \rho'_2)$$

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)

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Technical description

Overview

In many cases the pressure transmitter and the measured medium have to be physically separated. It is then necessary to use a remote seal.

The remote seals can be used with the following SITRANS P pressure transmitter series:

- Gauge pressure
 - P300 with HART, PROFIBUS PA, FOUNDATION Fieldbus
 - DS III with HART, PROFIBUS PA, FOUNDATION Fieldbus
 - P410 with HART, PROFIBUS PA, FOUNDATION Fieldbus
- Absolute pressure
 - P300, DS III with HART
 - DS III with PROFIBUS PA
 - DS III with FOUNDATION Fieldbus
- Differential pressure and flow
 - DS III with HART, PROFIBUS PA, FOUNDATION Fieldbus
 - P410 with HART, PROFIBUS PA, FOUNDATION Fieldbus
 - P500 with HART

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 measured 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 volume in contact with the measured medium is terminated by a flat elastic diaphragm lying in a bed. Between the diaphragm and the pressure transmitter is the filling liquid.

In many cases, a capillary has to be connected between the remote seal and the pressure transmitter in order e.g. to minimize temperature effects on the latter when hot media are involved.

However, the capillary influences the response time and the temperature response of the complete remote seal system. Two capillaries of equal length must always be used to connect a remote seal to a pressure transmitter for differential pressure.

The remote seal can be optionally equipped with a projecting diaphragm (tube).

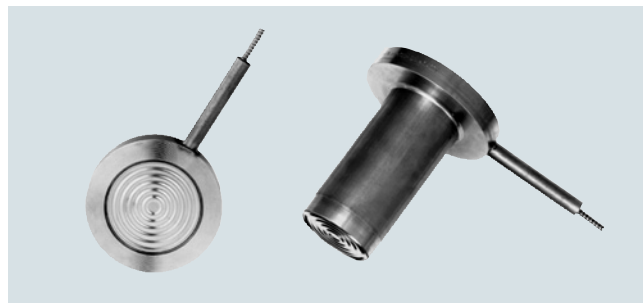
Remote seals of sandwich design are fitted with a dummy flange.

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 measured medium cannot accumulate in dead volumes. The quick-release clamp present on the remote seal means that quick dismounting is possible for cleaning.

Clamp-on seal



Clamp-on seal with quick-release design (left) and for flange mounting

With clamp-on 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 clamp-on 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 clamp-on seal can be cleaned by a pig.

The following types of clamp-on seals exist:

- Quick-release clamp-on 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.
- Clamp-on seals for flanging to EN or ASME.
- Clamp-on 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 or below, including during commissioning (see ordering data).

An example of a temperature error calculation can be found in the section "Technical Specifications".

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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 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 V01, V03 or V04, 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 V51, V53 or V54, 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.

Pressure Measurement

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Technical specifications of the remote seal filling liquids

Filling liquid	Number in the Article No.	Density at 20°C [kg/dm ³]	Viscosity at 20°C [mm ² /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".

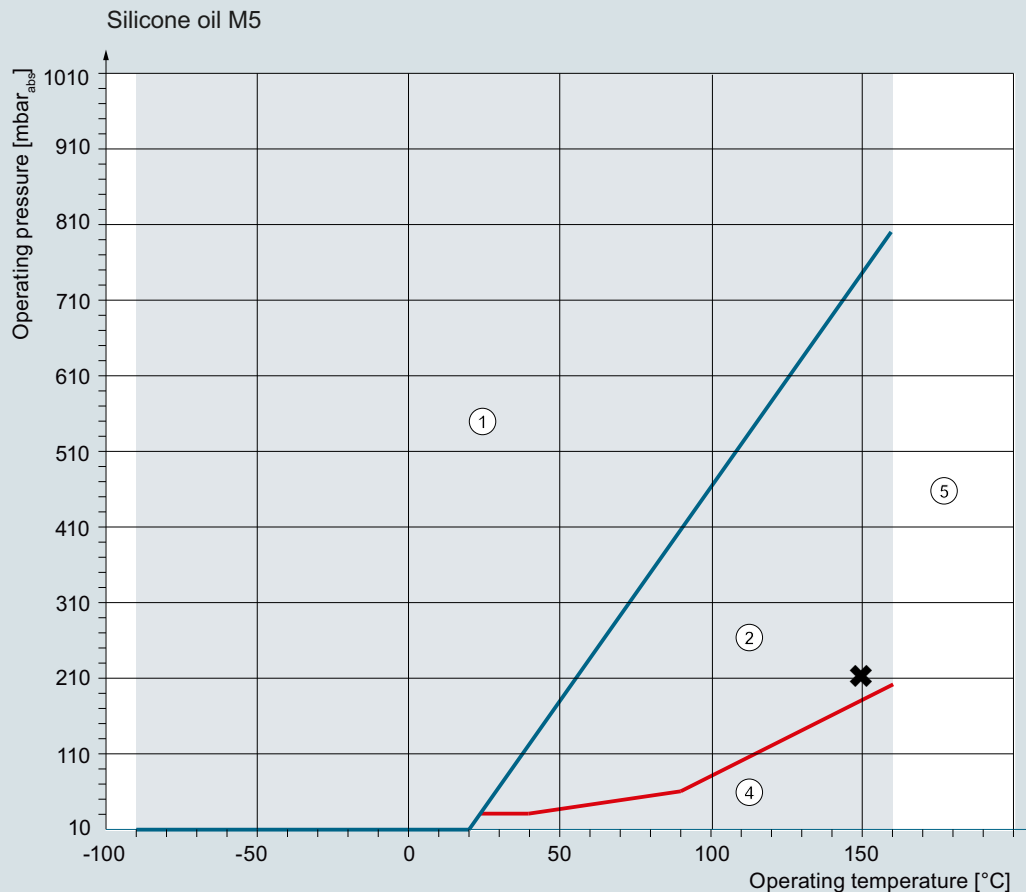
Selection of the required negative pressure service

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 "x" in the diagram below. This means the negative pressure service V01, V03 or V04 (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 1/415.



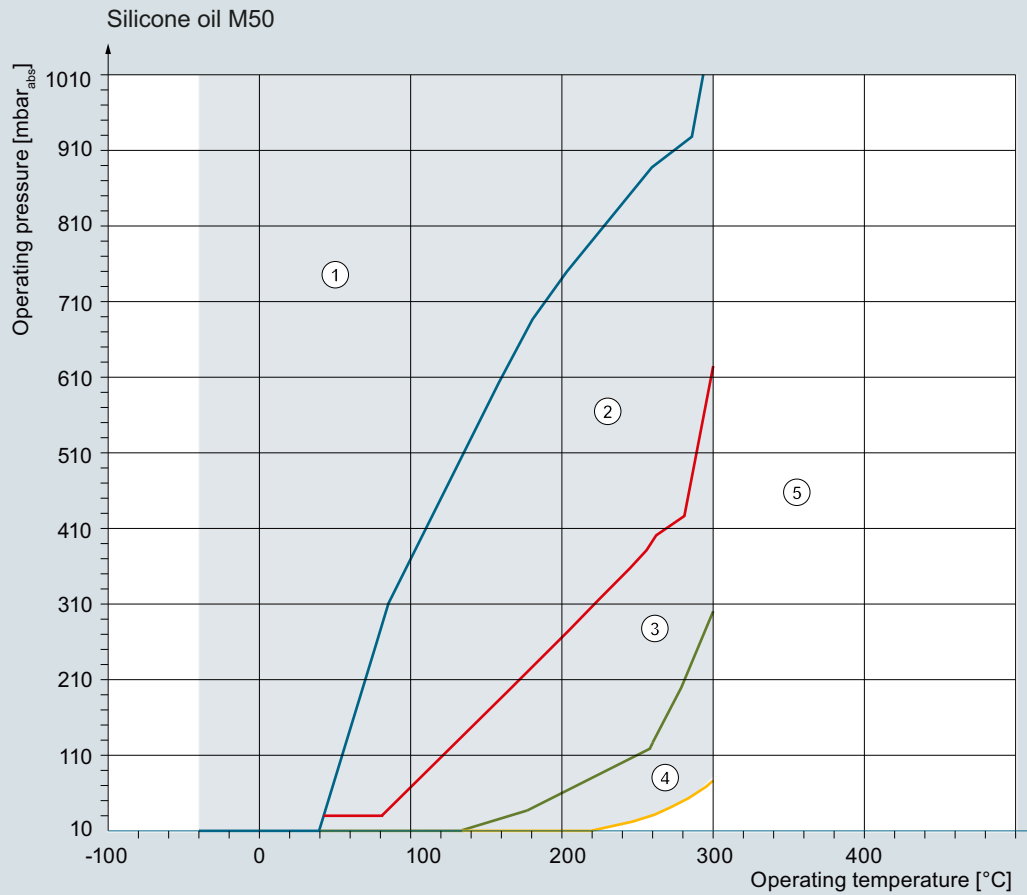
- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service V01, V03 or V04** is required.
Note: An extended negative pressure service is **not** possible for this fill fluid.
- ④ Please contact Technical Support for applications 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

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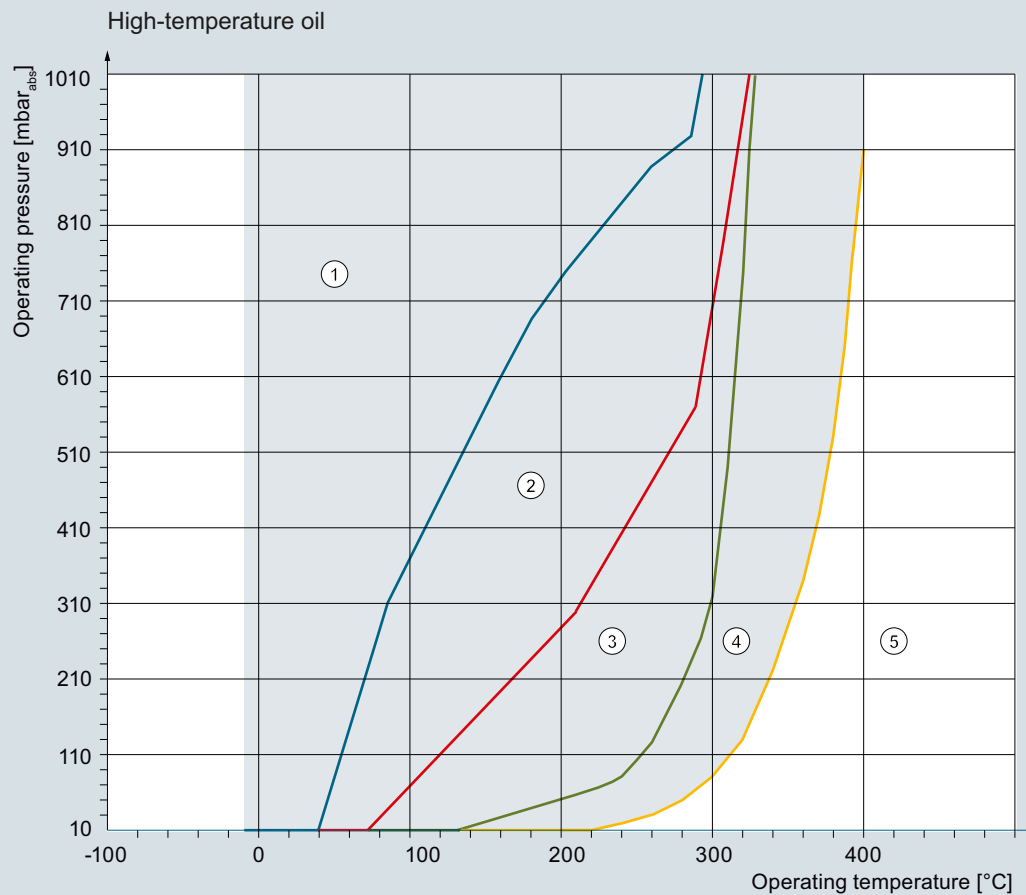
Technical description



- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service V01, V03 or V04** is required.
- ③ Operating range for which the **extended negative pressure service V51, V53 or V54** 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 V01, V03 or V04** is required.
- ③ Operating range for which the **extended negative pressure service V51, V53 or V54** 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.

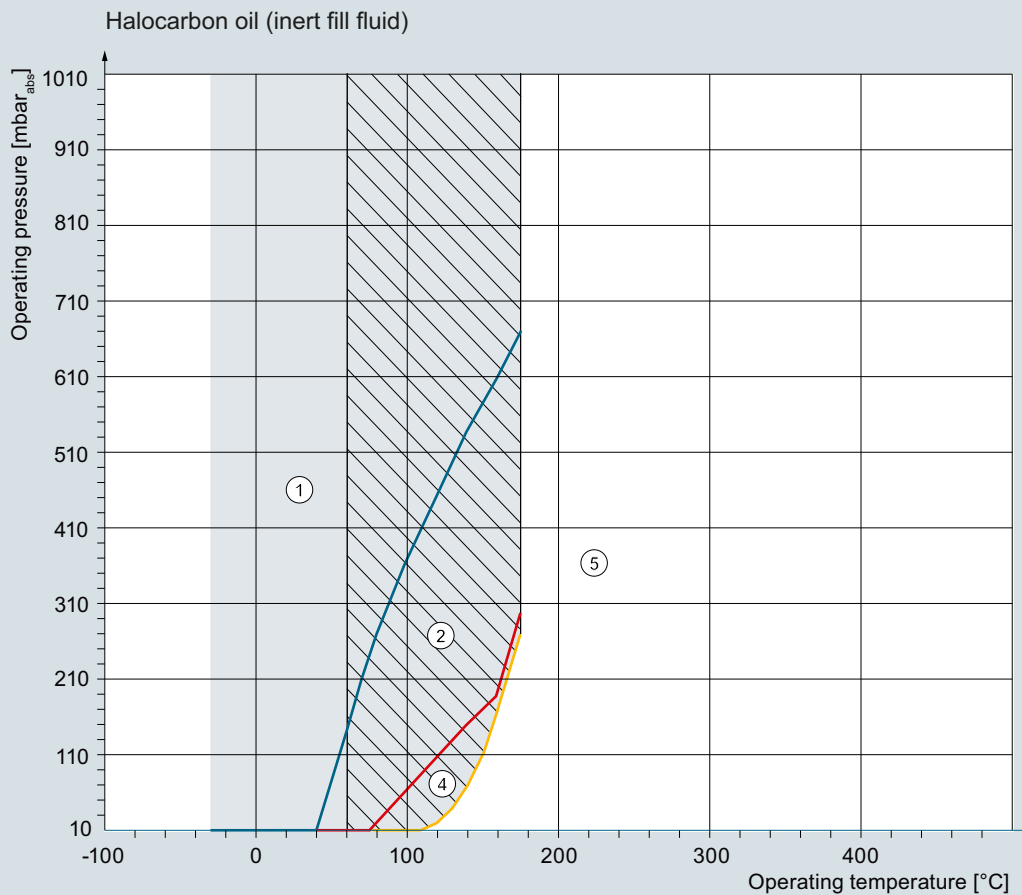
Permissible operating range:
Max. temperature limit: 400 °C
Min. temperature limit: -10 °C

Negative pressure applications with high-temperature oil

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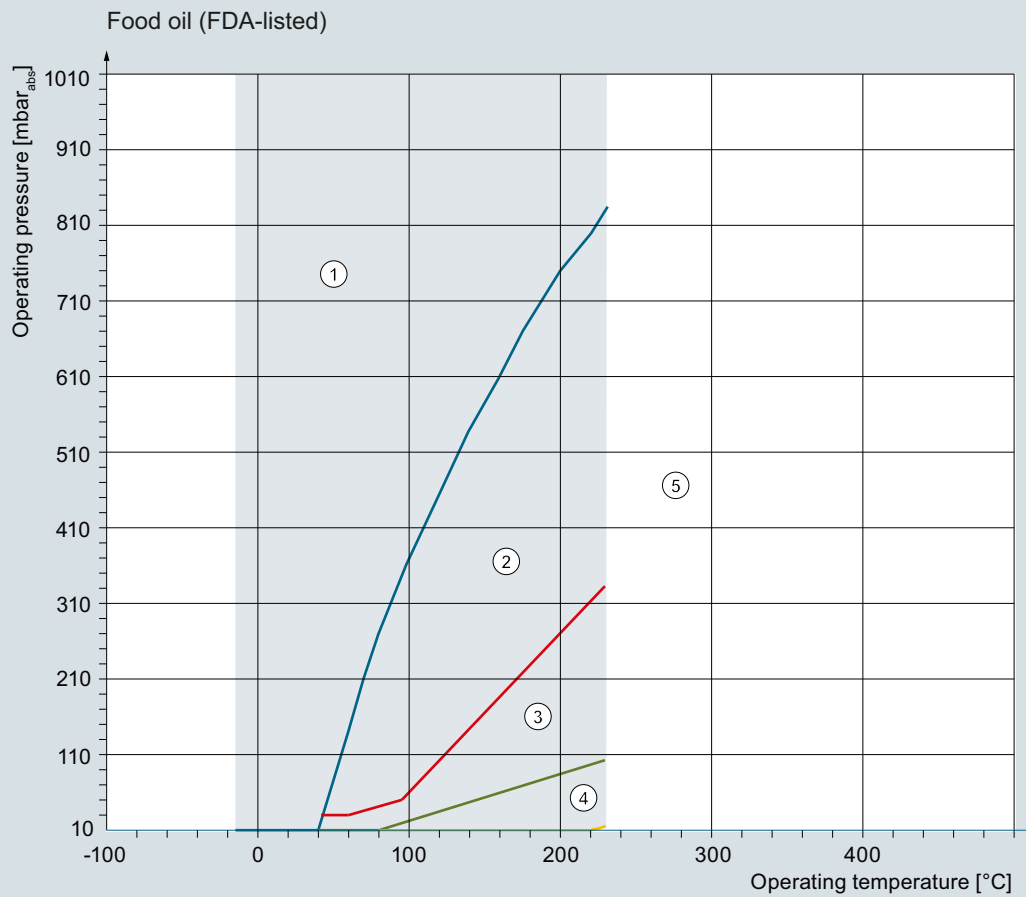
- ① Operating range of the standard remote seal design without special measures.
- ② Operating range for which the **negative pressure service V01, V03 or V04** is required.
Note: An extended negative pressure service is **not** possible for this fill fluid.
- ④ Please contact Technical Support for applications 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 V01, V03 or V04** is required.
- ③ Operating range for which the **extended negative pressure service V51, V53 or V54** 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)

Pressure Measurement

Remote seals for pressure transmitters
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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/connec- tion spigot f_{PF}		Recommended min. spans (guid- ance 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 connec- tion	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 dia- phragm 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.

Pressure Measurement

Remote seals for pressure transmitters
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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/connec- tion spigot f_{PF}		Recommended min. spans (guidance val- ues, 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 connec- tion	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.

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Remote seals for pressure transmitters
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Technical description

Temperature error Clamp-on seals

Temperature errors of clamp-on 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 pro- cess flange/connection spigot f_{PF}		Recommended min. 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 clamp-on 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 pro- cess flange/connection spigot f_{PF}		Recommended min. 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

Pressure Measurement

Remote seals for pressure transmitters

SITRANS P300, P DS III, P410, P500

Technical description

1

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	$f_{RS} = 0.05 \text{ mbar}/10 \text{ K}$ (0.039 inH ₂ O/10 K)
Capillary length	$l_{Cap} = 6 \text{ m}$ (19.7 ft)
Capillaries fitted on both sides	$f_{Cap} = 0.07 \text{ mbar}/(10 \text{ K} \cdot m_{Cap})$ (0.028 inH ₂ O/(10 K · m _{Cap}))
Filling liquid silicone oil M5	$f_{PF} = 0.07 \text{ mbar}/10 \text{ K}$ (0.028 inH ₂ O/10 K)
Process temperature	$\vartheta_{RS} = 100 \text{ °C}$ (212 °F)
Temperature on the capillaries	$\vartheta_{Cap} = 50 \text{ °C}$ (122 °F)
Temperature on pressure transmitter	$\vartheta_{TR} = 50 \text{ °C}$ (122 °F)
Calibration temperature	$\vartheta_{Cal} = 20 \text{ °C}$ (68 °F)

Required:

Additional temperature error of remote seals: dp

Calculation:

in mbar

$$dp = (100 \text{ °C} - 20 \text{ °C}) \cdot 0.05 \text{ mbar}/10 \text{ K} + (50 \text{ °C} - 20 \text{ °C}) \cdot 6 \text{ m} \cdot 0.07 \text{ mbar}/(10 \text{ K} \cdot \text{m}) + (50 \text{ °C} - 20 \text{ °C}) \cdot 0.07 \text{ mbar}/10 \text{ K}$$

$$dp = 0.4 \text{ mbar} + 1.26 \text{ mbar} + 0.21 \text{ mbar}$$

in inH₂O

$$dp = (212 \text{ °F} - 68 \text{ °F}) \cdot 0.039 \text{ inH}_2\text{O}/10 \text{ K} + (112 \text{ °F} - 68 \text{ °F}) \cdot 19.7 \text{ ft} \cdot 0.028 \text{ inH}_2\text{O}/(10 \text{ K} \cdot 3.28 \text{ ft}) + (112 \text{ °F} - 68 \text{ °F}) \cdot (0.028 \text{ inH}_2\text{O}/10 \text{ K})$$

$$dp = 0.16 \text{ inH}_2\text{O} + 0.51 \text{ inH}_2\text{O} + 0.08 \text{ inH}_2\text{O}$$

Result:

dp = 1.87 mbar (0.75 inH₂O)
(corresponds to 2.27% of set 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. medium temperature	Min./max. Pressure
Stainless steel, mat. no. 1.4404/316L	400 °C (752 °F)	No restrictions
PTFE coating	200 °C (392 °F) 260 °C (500 °F)	< 0 bar (0 psi); gauge pressure 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) 260 °C (500 °F)	< 0 bar (0 psi); gauge pressure 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. 2.4610	400 °C (752 °F)	No restrictions
Hastelloy C276, mat. no. 2.4819	400 °C (752 °F)	No restrictions
Hastelloy C22, mat. no. 2.4602	400 °C (752 °F)	No restrictions
Monel 400, mat. no. 2.4360	400 °C (752 °F)	No restrictions
Tantalum	300 °C (572 °F)	No restrictions
Duplex, mat. no. 1.4462	250 °C (482 °F)	No restrictions
Titanium	150 °C (302 °F)	No restrictions
Inconel	400 °C (752 °F)	No restrictions
Incoloy	400 °C (752 °F)	No restrictions
Gold coating	400 °C (752 °F)	No restrictions

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Technical description

The following maximum temperatures of the medium apply depending on the material of the wetted parts:

Maximum capillary length for diaphragm seals (guidance values)

Nom. diam.		Max. length of capillary			
		Diaphragm seal		Clamp-on 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 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 span within the range of the respective transmitter. The response times are of insignificant importance for 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. span of pressure transmitter					
	kg/dm ³	(lb/in ³)	°C	(°F)	250 mbar	(101 inH ₂ O)	600 mbar	(241 inH ₂ O)	1600 mbar	(643 inH ₂ O)
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 1/405 ff.

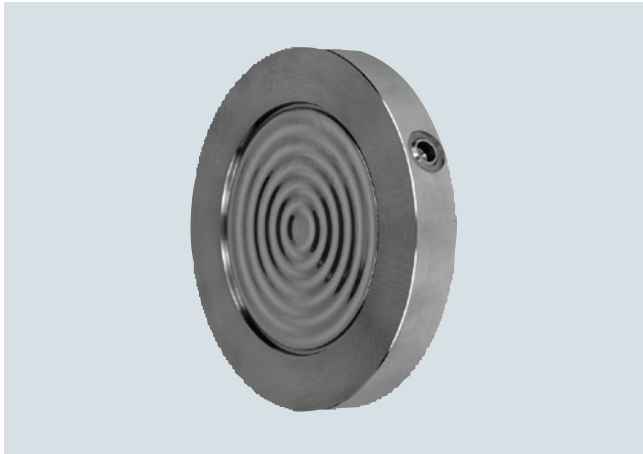
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seals of sandwich design with flexible capillary

1

Overview



Diaphragm seals of sandwich design

Technical specifications

Diaphragm seals of sandwich design

Nominal diameter	Nominal pressure
• DN 50	PN 16 ... PN 400
• DN 80	PN 16 ... PN 400
• DN 100	PN 16 ... PN 400
• DN 125	PN 16 ... PN 400
• 2 inch	Class 150 ... class 2500
• 3 inch	Class 150 ... class 2500
• 4 inch	Class 150 ... class 2500
• 5 inch	Class 150 ... class 2500
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
	<ul style="list-style-type: none"> • 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 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)

Pressure Measurement

Remote seals for pressure transmitters

SITRANS P300, P DS III, P410, P500

Diaphragm seals of sandwich design with flexible capillary

1

Selection and Ordering data		Article No.		Ord.code	
Diaphragm seal Sandwich-type design, with flexible capillary connected to a SITRANS P transmitter (order separately): for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... ¹⁾ ; Scope of delivery (1 off) for absolute pressure 7MF433-...; Scope of delivery (1 off) for differential pressure and flow 7MF243-...;7MF443-... and 7MF54-...; scope of delivery 2 off ➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		7MF4900-			
		7MF4901-			
		7MF4903-			
		1		B	
Nominal diameter and nominal pressure • DN 25 • DN 40 • DN 50 PN 16 ... 400 (recommended only for pressure transmitters for pressure) • DN 80 PN 16 ... 400 • DN 100 PN 16 ... 400 • DN 125 PN 16 ... 400 • 2 inch Class 150 ... 2500 (recommended only for pressure transmitters for pressure) • 3 inch Class 150 ... 2500 • 4 inch Class 150 ... 2500 • 5 inch Class 150 ... 2500 Smooth sealing surface to EN 1092-1, form B1 or to ASME B16.5 RF 125 ... 250 AA Other version Add Order code and plain text: Nominal diameter: ...; Nominal pressure: ... Sealing surface: see "Technical data"		Z Z A B C D E H L N Z		J 0 A J 0 B J 1 Y	
Wetted parts materials • Stainless steel 316L - without coating - with PTFE coating ²⁾ - with ECTFE coating ^{2) 3) 4)} - with PFA coating ^{2) 4)} • 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 (max. 150 °C (302 °F)) • Nickel 201 (max. 260 °C (500 °F)) • Duplex 2205, mat. no. 1.4462 • Duplex 2205, mat. no. 1.4462, incl. main body • Stainless steel 316L, gold plated, thickness approx. 25 µm		A E 0 F D G J U 0 V 0 K L 0 M 0 Q R S 0			
Tube length • without tube Other version: Add Order code and plain text: Wetted parts materials: ..., Tube length: ...		0 Z 8		K 1 Y	

Selection and Ordering data		Article No.		Ord.code	
Diaphragm seal Sandwich-type design, with flexible capillary connected to a SITRANS P transmitter (order separately): for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... ¹⁾ ; Scope of delivery (1 off) for absolute pressure 7MF433-...; Scope of delivery (1 off) for differential pressure and flow 7MF243-...;7MF443-... and 7MF54-...; scope of delivery 2 off		7MF4900-			
		7MF4901-			
		7MF4903-			
		1		B	
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") 51 ... 100 mm (2.01 ... 3.94") 100 mm (3.94") 101 ... 150 mm (3.98 ... 5.91") 150 mm (5.91") 151 ... 200 mm (5.94 ... 7.87") 200 mm (7.87") 201 ... 250 mm (7.91 ... 9.84") 250 mm (9.84") • Wetted parts materials: Stainless steel coated with ECTFE Range Standard length 20 ... 50 mm (0.79 ... 1.97") 50 mm (1.97") 51 ... 100 mm (2.01 ... 3.94") 100 mm (3.94") 101 ... 150 mm (3.98 ... 5.91") 150 mm (5.91") 151 ... 200 mm (5.94 ... 7.87") 200 mm (7.87") 201 ... 250 mm (7.91 ... 9.84") 250 mm (9.84") • Wetted parts materials: Stainless steel coated with PFA Range Standard length 20 ... 50 mm (0.79 ... 1.97") 50 mm (1.97") 51 ... 100 mm (2.01 ... 3.94") 100 mm (3.94") 101 ... 150 mm (3.98 ... 5.91") 150 mm (5.91") 151 ... 200 mm (5.94 ... 7.87") 200 mm (7.87") 201 ... 250 mm (7.91 ... 9.84") 250 mm (9.84") • Wetted parts materials: Monel 400 Range Standard length 20 ... 50 mm (0.79 ... 1.97") 50 mm (1.97") 51 ... 100 mm (2.01 ... 3.94") 100 mm (3.94") 101 ... 150 mm (3.98 ... 5.91") 150 mm (5.91") 151 ... 200 mm (5.94 ... 7.87") 200 mm (7.87") • Wetted parts materials: Hastelloy C276 Range Standard length 20 ... 50 mm (0.79 ... 1.97") 50 mm (1.97") 51 ... 100 mm (2.01 ... 3.94") 100 mm (3.94") 101 ... 150 mm (3.98 ... 5.91") 150 mm (5.91") 151 ... 200 mm (5.94 ... 7.87") 200 mm (7.87") • Wetted parts materials: Tantalum Range Standard length 20 ... 50 mm (0.79 ... 1.97") 50 mm (1.97") 51 ... 100 mm (2.01 ... 3.94") 100 mm (3.94") 101 ... 150 mm (3.98 ... 5.91") 150 mm (5.91") 151 ... 200 mm (5.94 ... 7.87") 200 mm (7.87")		A 1 A 2 A 3 A 4 A 5 F 1 F 2 F 3 F 4 F 5 D 1 D 2 D 3 D 4 D 5 G 1 G 2 G 3 G 4 J 1 J 2 J 3 J 4 K 1 K 2 K 3 K 4			

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

1

Diaphragm seals of sandwich design with flexible capillary

Selection and Ordering data

Diaphragm seal

Sandwich-type design, with flexible capillary connected to a SITRANS P transmitter (order separately):

for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-...¹⁾; Scope of delivery (1 off)

for absolute pressure 7MF433-...; Scope of delivery (1 off)

for differential pressure and flow 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery 2 off

Article No. Ord.code

7MF4900-

7MF4901-

7MF4903-

1 ■ ■ ■ - ■ B ■ ■ ■

Filling liquid

- Silicone oil M5
- Silicone oil M50
- High-temperature oil
- Halocarbon oil (for measuring O₂)⁵⁾
- Food oil (FDA listed)

Other version

Add Order code and plain text:

Filling liquid: ...

1

2

3

4

7

9

M1Y

Length of capillary⁶⁾

- 1.0 m (3.28 ft)
- 1.6 m (5.25 ft)
- 2.5 m (8.20 ft)
- 4.0 m (13.1 ft)
- 6.0 m (19.7 ft)
- 8.0 m (26.25 ft)
- 10.0 m (32.8 ft)

2

3

4

5

6

7

8

Special lengths for capillaries

- 2.0 m (6.56 ft)
- 3.0 m (9.84 ft)
- 5.0 m (16.40 ft)
- 7.0 m (23.97 ft)
- 9.0 m (29.53 ft)

9

9

9

9

9

N1C

N1E

N1G

N1J

N1L

only for 7MF4903-...

- 11.0 m (36.09 ft)
- 12.0 m (39.37 ft)
- 13.0 m (42.65 ft)
- 14.0 m (45.93 ft)
- 15.0 m (49.21 ft)

9

9

9

9

9

N1N

N1P

N1Q

N1R

N1S

¹⁾ With 7MF802-... and the measuring cells Q, S, T and U also order negative pressure service version.

²⁾ Only possible up to max. PN 100.

³⁾ For vacuum on request

⁴⁾ Only for use in non-hazardous atmospheres.

⁵⁾ Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.

⁶⁾ Max. capillary length, see section "Technical description".

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Article No. and specify Order code.

Customer-specific tubus length

Y44

Select range, enter desired length in plain text (No entry = standard length)

Spark arrestor

With spark arrestor for mounting on zone 0 (including documentation)

- Pressure and absolute pressure

A01

- for differential pressure transmitters

A02

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 Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2

C11

Inspection certificate

to EN 10204, section 3.1

C12

2.2 Certificate of FDA approval of fill oil

Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"

C17

Functional safety certificate ("SIL 2") to IEC 61508

(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)

C20

Functional safety certificate ("SIL 2/3") to IEC 61508

(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)

C23

Certification acc. to NACE MR-0175

Includes acceptance test certificate 3.1 according 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 acceptance test certificate 3.1 according 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 vacuum-proof design and not for 7MF4901-...)

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 G $\frac{1}{2}$ B according to EN 837-1

E15

One-sided mounting on differential pressure transmitters

(only for 7MF4900-...)

on high-pressure side

on low-pressure side

H10

H11

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seals of sandwich design with flexible capillary

1

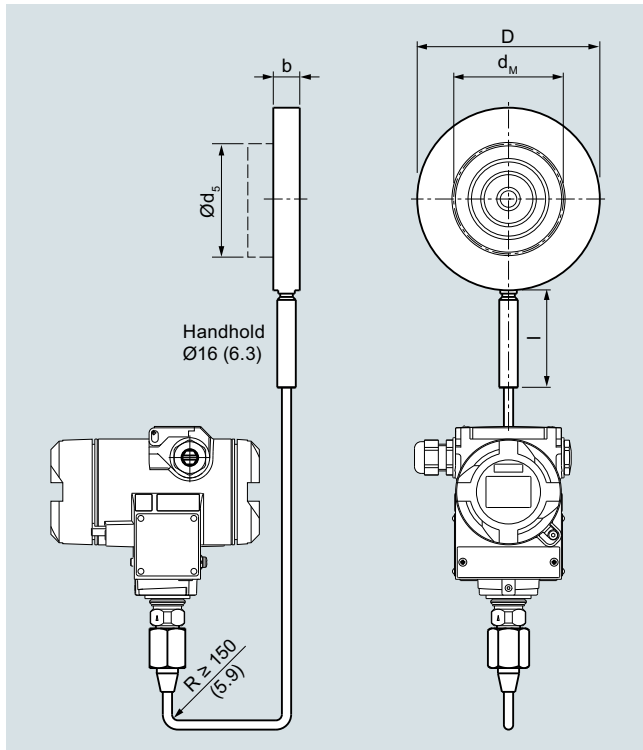
Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Further designs	
Please add "-Z" to Article No. and specify Order code.		Please add "-Z" to Article No. and specify Order code.	
Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm)	J11	PE protective tube	
previously DIN 2501, form E		over the spiral protective tube of the capillaries (color: white)	
Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA	J12	1.0 m (3.28 ft)	N20
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)		1.6 m (5.25 ft)	N21
Sealing surface groove, EN 1092-1, form D	J14	2.0 m (6.56 ft)	N22
instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)		2.5 m (8.20 ft)	N23
Sealing surface RJF (groove, previously RTJ) ASME B16.5	J24	3.0 m (9.84 ft)	N24
instead of sealing surface ASME B16.5 RF 125 ... 250 AA (only for wetted parts made of stainless steel 316L)		4.0 m (13.12 ft)	N25
Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L		5.0 m (16.40 ft)	N26
DN 25	J30	6.0 m (19.69 ft)	N27
DN 40	J31	7.0 m (22.97 ft)	N28
DN 50	J32	8.0 m (26.25 ft)	N29
DN 80	J33	9.0 m (29.53 ft)	N30
DN 100	J34	10.0 m (32.81 ft)	N31
DN 125	J35	<u>only for 7MF4903-...</u>	
Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L		11.0 m (36.09 ft)	N32
DN 25	J40	12.0 m (39.37 ft)	N33
DN 40	J41	13.0 m (42.65 ft)	N34
DN 50	J42	14.0 m (45.93 ft)	N35
DN 80	J43	15.0 m (49.21 ft)	N36
DN 100	J44		
DN 125	J45	PTFE protective tube	
Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L		over the spiral protective tube of the capillaries (color: transparent)	
DN 25	J50	1.0 m (3.28 ft)	N40
DN 40	J51	1.6 m (5.25 ft)	N41
DN 50	J52	2.0 m (6.56 ft)	N42
DN 80	J53	2.5 m (8.20 ft)	N43
DN 100	J54	3.0 m (9.84 ft)	N44
DN 125	J55	4.0 m (13.12 ft)	N45
		5.0 m (16.40 ft)	N46
		6.0 m (19.69 ft)	N47
		7.0 m (22.97 ft)	N48
		8.0 m (26.25 ft)	N49
		9.0 m (29.53 ft)	N50
		10.0 m (32.81 ft)	N51
		<u>only for 7MF4903-...</u>	
		11.0 m (36.09 ft)	N52
		12.0 m (39.37 ft)	N53
		13.0 m (42.65 ft)	N54
		14.0 m (45.93 ft)	N55
		15.0 m (49.21 ft)	N56

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seals of sandwich design with flexible capillary

Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code.	
PVC protective tube over the spiral protective tube of the capillaries (color: black)	
1.0 m (3.28 ft)	N60
1.6 m (5.25 ft)	N61
2.0 m (6.56 ft)	N62
2.5 m (8.20 ft)	N63
3.0 m (9.84 ft)	N64
4.0 m (13.12 ft)	N65
5.0 m (16.40 ft)	N66
6.0 m (19.69 ft)	N67
7.0 m (22.97 ft)	N68
8.0 m (26.25 ft)	N69
9.0 m (29.53 ft)	N70
10.0 m (32.81 ft)	N71
<u>only for 7MF4903-...</u>	
11.0 m (36.09 ft)	N72
12.0 m (39.37 ft)	N73
13.0 m (42.65 ft)	N74
14.0 m (45.93 ft)	N75
15.0 m (49.21 ft)	N76
Negative pressure service for use in low-pressure range for transmitters for	
• gauge and absolute pressure from the pressure series	V01
• differential pressure	V03
Extended negative pressure service for use in low-pressure range for transmitters for	
• gauge and absolute pressure from the pressure series	V51
• differential pressure	V53

Dimensional drawings

Diaphragm seals of sandwich design with flexible capillary for connection to SITRANS P pressure transmitters for pressure, dimensions in mm (inch)

Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d ₅	d _M	l
		mm	mm	mm	mm	mm
DN 50	PN 16 ... PN 400	20	102	48.3	45 ¹⁾	100
DN 80		20	138	76	72 ²⁾	100
DN 100		20	158	94	89	100
DN 125		22	188	125	124	100

Connection to ASME B16.5

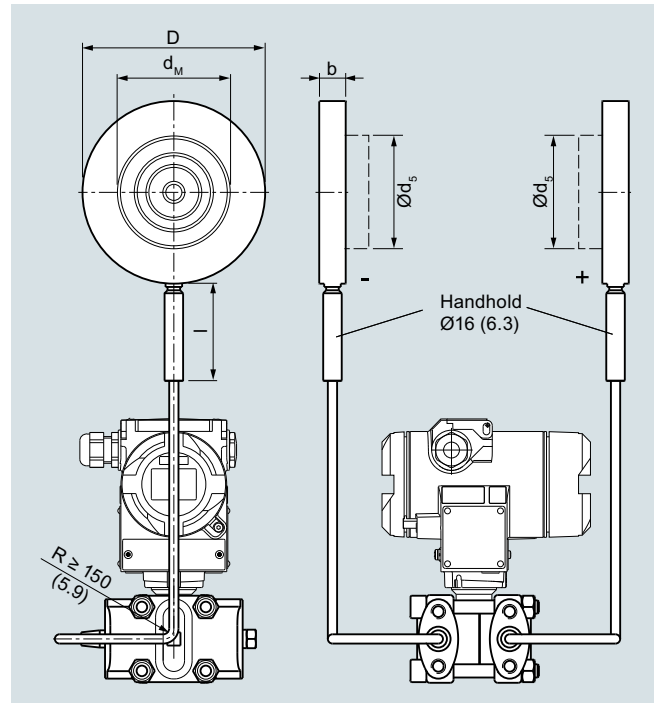
Nom. diam.	Nom. press.	b	D	d ₅	d _M	l
	lb/sq.in.	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
2 inch	150 ... 2500	20 (0.79)	100 (3.94)	48.3 (1.9)	45 ¹⁾ (1.77)	100 (3.94)
3 inch		20 (0.79)	134 (5.28)	72 (2.83)	72 ²⁾ (2.83)	100 (3.94)
4 inch		20 (0.79)	158 (6.22)	94 (3.69)	89 (2.32)	100 (3.94)
5 inch		22 (0.87)	186 (7.32)	125 (4.92)	124 (4.88)	100 (3.94)

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

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



Diaphragm seals of sandwich design (without flange) with flexible capillary for connection to SITRANS P pressure transmitters for absolute pressure or differential pressure and flow, dimensions in mm (inch)

Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d ₅	d _M	l
		mm	mm	mm	mm	mm
DN 50	PN 16 ... PN 400	20	102	48.3	45 ¹⁾	100
DN 80		20	138	76	72 ²⁾	100
DN 100		20	158	94	89	100
DN 125		22	188	125	124	100

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d ₅	d _M	l
	lb/sq.in.	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
2 inch	150 ... 2500	20 (0.79)	100 (3.94)	48.3 (1.9)	45 ¹⁾ (1.77)	100 (3.94)
3 inch		20 (0.79)	134 (5.28)	72 (2.83)	72 ²⁾ (2.83)	100 (3.94)
4 inch		20 (0.79)	158 (6.22)	94 (3.69)	89 (2.32)	100 (3.94)
5 inch		22 (0.87)	186 (7.32)	125 (4.92)	124 (4.88)	100 (3.94)

d: Inside diameter of gasket according to EN 1092-1/ASME B16.5

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

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

1

Diaphragm seals of flange design with flexible capillary

Overview



Diaphragm seals of flange design

Technical specifications

Diaphragm seals of flange design with flexible capillary

Nominal diameter	Nominal pressure
• DN 50 (recommendable only for pressure transmitters for pressure)	PN 10/16/25/40, PN 100
• DN 80	PN 10/16/25/40, PN 100
• DN 100	PN 10/16, PN 25/40
• DN 125	PN 16, PN 40
• 2 inch (recommendable only for pressure transmitters for pressure)	Class 150, class 300, class 400/600, class 900/1500
• 3 inch	Class 150, class 300, class 600
• 4 inch	Class 150, class 300, class 400
• 5 inch	Class 150, class 300, class 400
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
	<ul style="list-style-type: none"> • 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. 1.4404/316L

• Sheath

Sealing material in the process flanges

- For pressure transmitters, absolute pressure transmitters and low-pressure applications
- For other applications

Maximum pressure

Tube length

Capillary

- Length

- Internal diameter

- Minimum bending radius

Filling liquid

(for remote seals of sandwich and flange design)

Permissible ambient temperature

Weight

Certificate and approvals

Classification according to pressure equipment directive (DGRL 2014/68/EU)

Spiral protective tube made of stainless steel, mat. no. 1.4301/304

Copper

Viton

See above and the technical data of the pressure transmitter

Without tube as standard (tube available on request)

Max. 10 m (32.8 ft), longer lengths on request

2 mm (0.079 inch)

150 mm (5.9 inch)

Silicone oil M5

Silicone oil M50

High-temperature oil

Halocarbon oil (for measuring O₂)

Food oil (FDA listed)

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

Approx. 4 kg (8.82 lb)

For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)

Pressure Measurement

Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

Diaphragm seals of flange design with flexible capillary

1

Selection and Ordering data		Article No. Ord. code	
Diaphragm seal		Diaphragm seal	
Flange design, with flexible capillary, connected to a pressure transmitter SITRANS P (order separately):		Flange design, with flexible capillary, connected to a pressure transmitter SITRANS P (order separately):	
for pressure 7MF2033-...; 7MF403-... and 7MF423-... (absolute pressure (gauge pressure series) together with Order code "V01" (Negative pressure service) and 7MF802-... ¹⁾ ; scope of delivery: 1 off		for pressure 7MF2033-...; 7MF403-... and 7MF423-... (absolute pressure (gauge pressure series) together with Order code "V01" (Negative pressure service) and 7MF802-... ¹⁾ ; scope of delivery: 1 off	
for absolute pressure (differential pressure series 7MF433-...; scope of delivery: 1 off		for absolute pressure (differential pressure series 7MF433-...; scope of delivery: 1 off	
for differential pressure and flow 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery: 2 off		for differential pressure and flow 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery: 2 off	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.		Wetted parts materials	
Nominal diameter and nominal pressure		<ul style="list-style-type: none"> Stainless steel 316L <ul style="list-style-type: none"> without coating with PTFE coating with ECTFE coating^{2) 3)} with PFA coating³⁾ 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 (max. 150 °C (302 °F)) Nickel 201 (max. 260 °C (500 °F)) Duplex 2205, mat. no. 1.4462 Duplex 2205, mat. no. 1.4462, incl. main body Stainless steel 316L, gold plated, thickness approx. 25 µm 	
• DN 25	PN 10/16/25/40	Z	J 0 A
	PN 63/100/160	Z	J 0 B
• DN 40	PN 10/16/25/40	Z	J 0 C
	PN 63/100	Z	J 0 D
	PN 160	Z	J 0 E
• DN 50	PN 10/16/25/40	A	
	PN 100	B	
(DN 50 recommended only for pressure transmitters for pressure)			
• DN 80	PN 10/16/25/40	D	
	PN 100	E	
• DN 100	PN 10/16	G	
• DN 125	PN 25/40	H	
	PN 10/16	J	
	PN 25/40	K	
• 1 inch	Class 150	Z	J 6 A
	Class 300	Z	J 6 B
	Class 400/600	Z	J 6 C
	Class 900/1500	Z	J 6 D
• 1½ inch	Class 150	Z	J 6 E
	Class 300	Z	J 6 F
	Class 400/600	Z	J 6 G
	Class 900/1500	Z	J 6 H
• 2 inch	Class 150	L	
	Class 300	M	
	Class 400/600	N	
	Class 900/1500	P	
(2 inch recommended only for pressure transmitters for pressure)			
• 3 inch	Class 150	Q	
	Class 300	R	
	Class 600	S	
• 4 inch	Class 150	T	
	Class 300	U	
	Class 400	V	
• 5 inch	Class 150	W	
	Class 300	X	
	Class 400	Y	
• JIS DN 50	10 K 316L	Z	J 7 A
	20 K 316L	Z	J 7 B
• JIS DN 80	10 K 316L	Z	J 7 C
	20 K 316L	Z	J 7 D
Smooth sealing surface to EN 1092-1, form B1 or to ASME B16.5 RF 125 ... 250 AA			
Other version		Z	J 1 Y
Add Order code and plain text: Nominal diameter: ...; Nominal pressure: ... Sealing surface: See "Technical data"			

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seals of flange design with flexible capillary

Selection and Ordering data

Article No. Ord. code

Diaphragm seal

Flange design, with flexible capillary, connected to a pressure transmitter
SITRANS P (order separately):

for pressure 7MF2033-...; 7MF403-... and 7MF423-... (absolute pressure (gauge pressure series) together with Order code "V01" (Negative pressure service) and 7MF802-...¹⁾; scope of delivery: 1 off

for absolute pressure (differential pressure series 7MF433-...; scope of delivery: 1 off

for differential pressure and flow 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery: 2 off

7MF4920 -

7MF4921 -

7MF4923 -

1 ■ ■ ■ ■ - ■ B ■ ■ ■ ■

Tube length

- without tube

Other version:

Add Order code and plain text:

Wetted parts materials: ...

Tube length: ...

0

Z 8

K 1 Y

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")	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 materials: Stainless steel coated with ECTFE

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 materials: Stainless steel coated with PFA

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 materials: 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 materials: 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 materials: 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

Article No. Ord. code

Diaphragm seal

Flange design, with flexible capillary, connected to a pressure transmitter
SITRANS P (order separately):

for pressure 7MF2033-...; 7MF403-... and 7MF423-... (absolute pressure (gauge pressure series) together with Order code "V01" (Negative pressure service) and 7MF802-...¹⁾; scope of delivery: 1 off

for absolute pressure (differential pressure series 7MF433-...; scope of delivery: 1 off

for differential pressure and flow 7MF243-...; 7MF443-... and 7MF54-...; scope of delivery: 2 off

7MF4920 -

7MF4921 -

7MF4923 -

1 ■ ■ ■ ■ - ■ B ■ ■ ■ ■

Filling liquid

- Silicone oil M5
- Silicone oil M50
- High-temperature oil
- Halocarbon oil (for measuring O₂)⁴⁾
- Food oil (FDA listed)

Other version

Add Order code and plain text:

Filling liquid: ...

1

2

3

4

7

9

M 1 Y

Length of capillary⁵⁾

- 1.0 m (3.28 ft)
- 1.6 m (5.25 ft)
- 2.5 m (8.20 ft)
- 4.0 m (13.1 ft)
- 6.0 m (19.7 ft)
- 8.0 m (26.25 ft)
- 10.0 m (32.8 ft)

2

3

4

5

6

7

8

Special lengths for capillaries

- 2.0 m (6.56 ft)
- 3.0 m (9.84 ft)
- 5.0 m (16.40 ft)
- 7.0 m (23.97 ft)
- 9.0 m (29.53 ft)

9

9

9

9

9

9

N 1 C

N 1 E

N 1 G

N 1 J

N 1 L

only for 7MF4923-...

- 11.0 m (36.09 ft)
- 12.0 m (39.37 ft)
- 13.0 m (42.65 ft)
- 14.0 m (45.93 ft)
- 15.0 m (49.21 ft)

9

9

9

9

9

9

N 1 N

N 1 P

N 1 Q

N 1 R

N 1 S

¹⁾ With 7MF802-... and the measuring cells Q, S, T and U also order the negative pressure service.

²⁾ For vacuum on request.

³⁾ Only for use in non-hazardous atmospheres.

⁴⁾ Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.

⁵⁾ Max. capillary length, see section "Technical description".

Pressure Measurement

Remote seals for pressure transmitters

SITRANS P300, P DS III, P410, P500

Diaphragm seals of flange design with flexible capillary

1

Selection and Ordering data	Order code
Further designs Please 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 arrestor With spark arrestor for mounting on zone 0 (including documentation) for transmitters for	
• pressure and absolute pressure	A01
• differential pressure	A02
Remote seal nameplate Attached out of stainless steel, contains MLFB and order number of the remote seal	B20
Oil- and grease-free cleaned version Oil- and grease-free cleaned and packed ver- sion, <u>not for oxygen application</u> , only in conjunc- tion with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2	C10
Quality Inspection Certificate (5-point charac- teristic curve test) according to IEC 60770-2	C11
Inspection certificate to EN 10204, section 3.1	C12
2.2 Certificate of FDA approval of fill oil Only in conjunction with "Food-grade oil" fill liq- uid (FDA listed)"	C17
Functional safety certificate ("SIL 2") to IEC 61508 (Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)	C20
Functional safety certificate ("SIL 2/3") to IEC 61508 (Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)	C23
Certification acc. to NACE MR-0175 Includes acceptance test certificate 3.1 accord- ing 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 acceptance test certificate 3.1 accord- ing 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 ver- sion, <u>only for oxygen application</u> , 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 certi- ficate acc. to EN 10204-2.2	E10
Epoxy painting (not possible with negative pressure service and not for 7MF4921-...) 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 accord- ing to EN 837-1.	E15
One-sided mounting on differential pressure transmitters (only for 7MF4920-...) on high-pressure side on low-pressure side	H10 H11

Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code.	
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 C, (previously DIN 2512, form F) in stainless steel 316L DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	J30 J31 J32 J33 J34 J35
Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	J40 J41 J42 J43 J44 J45
Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	J50 J51 J52 J53 J54 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

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

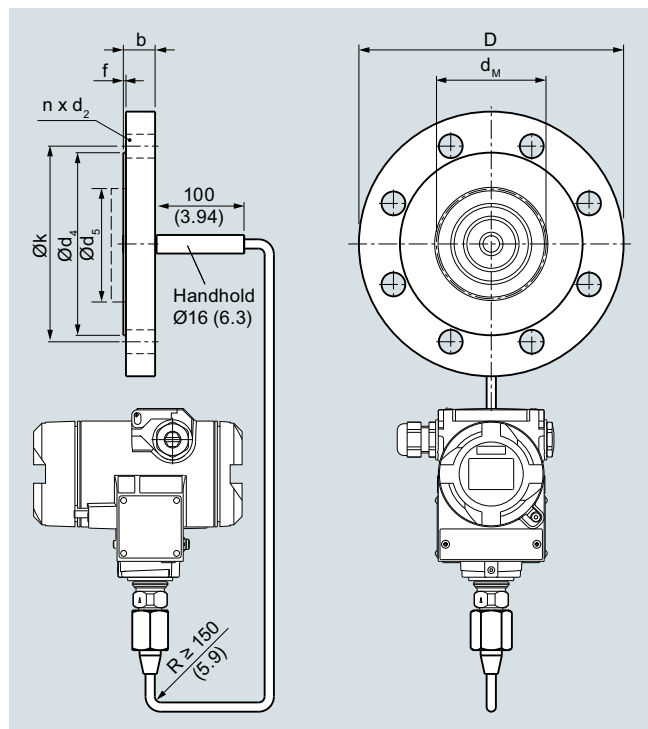
Diaphragm seals of flange design with flexible capillary

1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code.		PVC protective tube over the spiral protective tube of the capillaries (color: black)	
Radial capillary pipe outlet for one-sided mounting for two-sided mounting	K01 K03	1.0 m (3.28 ft) 1.6 m (5.25 ft) 2.0 m (6.56 ft) 2.5 m (8.20 ft) 3.0 m (9.84 ft) 4.0 m (13.12 ft) 5.0 m (16.40 ft) 6.0 m (19.69 ft) 7.0 m (22.97 ft) 8.0 m (26.25 ft) 9.0 m (29.53 ft) 10.0 m (32.81 ft)	N60 N61 N62 N63 N64 N65 N66 N67 N68 N69 N70 N71
PE protective tube over the spiral protective tube of the capillaries (color: white)	N20 N21 N22 N23 N24 N25 N26 N27 N28 N29 N30 N31	2.5 m (8.20 ft) 3.0 m (9.84 ft) 4.0 m (13.12 ft) 5.0 m (16.40 ft) 6.0 m (19.69 ft) 7.0 m (22.97 ft) 8.0 m (26.25 ft) 9.0 m (29.53 ft) 10.0 m (32.81 ft)	N63 N64 N65 N66 N67 N68 N69 N70 N71
only for 7MF4923-...		only for 7MF4923-...	
11.0 m (36.09 ft) 12.0 m (39.37 ft) 13.0 m (42.65 ft) 14.0 m (45.93 ft) 15.0 m (49.21 ft)	N32 N33 N34 N35 N36	11.0 m (36.09 ft) 12.0 m (39.37 ft) 13.0 m (42.65 ft) 14.0 m (45.93 ft) 15.0 m (49.21 ft)	N72 N73 N74 N75 N76
PTFE protective tube over the spiral protective tube of the capillaries (color: transparent)		Negative pressure service for use in low-pressure range for transmitters for <ul style="list-style-type: none"> gauge and absolute pressure from the pressure series differential pressure 	V01 V03
only for 7MF4923-...		Extended negative pressure service for use in low-pressure range for transmitters for <ul style="list-style-type: none"> gauge and absolute pressure from the pressure series differential pressure 	V51 V53
11.0 m (36.09 ft) 12.0 m (39.37 ft) 13.0 m (42.65 ft) 14.0 m (45.93 ft) 15.0 m (49.21 ft)	N40 N41 N42 N43 N44 N45 N46 N47 N48 N49 N50 N51 N52 N53 N54 N55 N56		

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seals of flange design with flexible capillary**Dimensional drawings**

Diaphragm seals of flange design with flexible capillary for connection to SITRANS P pressure transmitters for pressure, dimensions in mm (inch)

Connection to EN 1092-1

Nom. diam.	Nom. press.	b mm	D mm	d ₂ mm	d ₄ mm	d ₅ mm	d _M mm	f mm	k mm	n
DN 50	PN 10/1	20	165	18	102	48.3	45 ¹⁾	2	125	4
	PN 100	28	195	26	102	48.3	45 ¹⁾	2	145	4
DN 80	PN 10/1	24	200	18	138	76	72 ²⁾	2	160	8
	PN 100	32	230	26	138	76	72 ²⁾	2	180	8
DN 100	PN 10/1	20	220	18	158	94	89	2	180	8
	PN 25/4	24	235	22	162	94	89	2	190	8
DN 125	PN 16	22	250	18	188	125	124	2	210	8
	PN 40	26	270	26	188	125	124	2	220	8

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d ₂	d ₄	d ₅	d _M	f	k	n
lb/sq.in.	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)
2 inch	150	19.5 (0.77)	150 (5.80)	20 (0.79)	92 (3.62)	48.3 (1.9)	45 ¹⁾ (1.77)	2 (0.08)	120.5 (4.74)	4
	300	22.7 (0.89)	165 (6.50)	20 (0.79)	92 (3.62)	48.3 (1.9)	45 ¹⁾ (1.77)	2 (0.08)	127 (5)	8
	400/ 600	32.4 (1.28)	165 (6.50)	20 (0.79)	92 (3.62)	48.3 (1.9)	45 ¹⁾ (1.77)	2 (0.08)	127 (5)	8
	900/ 1500	45.1 (1.78)	215 (8.46)	26 (1.02)	92 (3.62)	48.3 (1.9)	45 ¹⁾ (1.77)	7 (0.28)	165 (6.5)	8
3 inch	150	24.3 (0.96)	190 (7.48)	20 (0.79)	127 (5)	76 (3)	72 ²⁾ (2.83)	2 (0.08)	152.5 (6)	4
	300	29 (1.14)	210 (8.27)	22 (0.87)	127 (5)	76 (3)	72 ²⁾ (2.83)	2 (0.08)	168.5 (6.63)	8
	600	38.8 (1.53)	210 (8.27)	22 (0.87)	127 (5)	76 (3)	72 ²⁾ (2.83)	7 (0.28)	168.5 (6.63)	8
4 inch	150	24.3 (0.96)	230 (9.06)	20 (0.79)	158 (6.22)	94 (3.69)	89 (3.50)	2 (0.08)	190.5 (7.5)	8
	300	32.2 (1.27)	255 (10.04)	22 (0.87)	158 (6.22)	94 (3.69)	89 (3.50)	2 (0.08)	200 (7.87)	8
	400	42 (1.65)	255 (10.04)	26 (1.02)	158 (6.22)	94 (3.69)	89 (3.50)	7 (0.28)	200 (7.87)	8
5 inch	150	24.3 (0.96)	255 (10.04)	22 (0.87)	186 (7.32)	125 (4.92)	124 (4.88)	2 (0.08)	216 (8.50)	8
	300	35.8 (1.41)	280 (11.02)	22 (0.87)	186 (7.32)	125 (4.92)	124 (4.88)	2 (0.08)	235 (9.25)	8
	400	45.1 (1.79)	280 (11.02)	26 (1.02)	186 (7.32)	125 (4.92)	124 (4.88)	7 (0.28)	235 (9.25)	8

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d_M: Effective diaphragm diameter

¹⁾ 59 mm = 2.32 inch with tube length L = 0

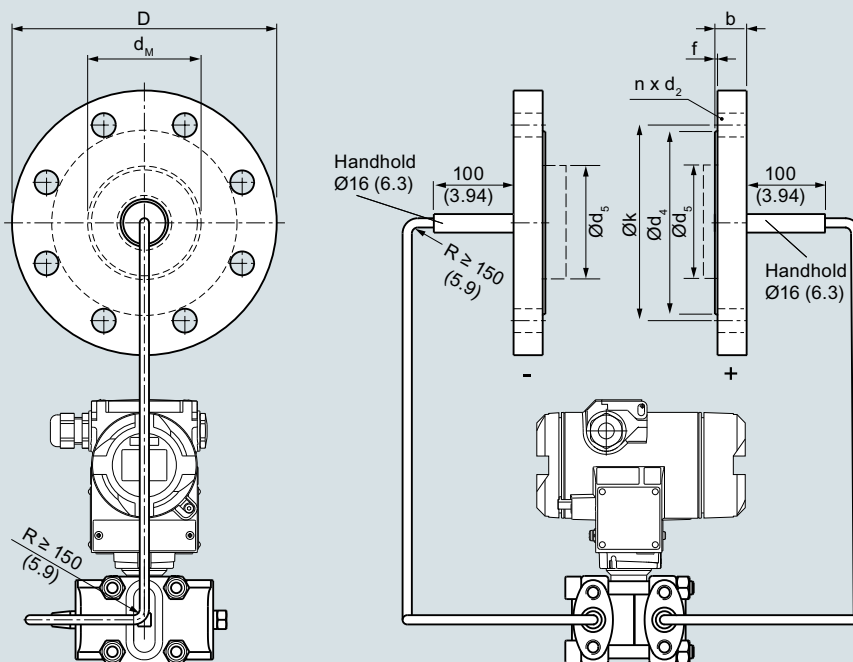
²⁾ 89 mm = 3½ inch with tube length L = 0

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

1

Diaphragm seals of flange design with flexible capillary



Diaphragm seals of flange design with flexible capillary for connection to SITRANS P pressure transmitters for absolute pressure or for differential pressure and flow, dimensions in mm (inch)

Connection to EN 1092-1

Nom. diam.	Nom. press.	b mm	D mm	d ₂ mm	d ₄ mm	d ₅ mm	d _M mm	f mm	k mm	n
DN 80	PN 10/16	24	200	18	138	76	72 ¹⁾	2	160	8
	PN 100	32	230	26	138	76	72 ¹⁾	2	180	8
DN 100	PN 10/16	20	220	18	158	94	89	2	180	8
	PN 25/40	24	235	22	162	94	89	2	190	8
DN 125	PN 16	22	250	18	188	125	124	2	210	8
	PN 40	26	270	26	188	125	124	2	220	8

Connection to ASME B16.5

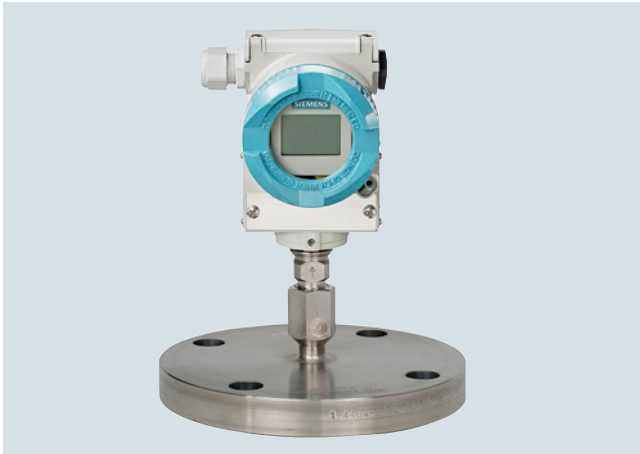
Nom. diam.	Nom. press.	b mm	D mm	d ₂ mm	d ₄ mm	d ₅ mm	d _M mm	f mm	k mm	n
lb/sq.in.		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	
3 inch	150	24.3 (0.96)	190 (7.48)	20 (0.79)	127 (5)	76 (3)	72 ¹⁾ (2.83)	2 (0.08)	152.5 (6)	4
	300	29 (1.14)	210 (8.27)	22 (0.87)	127 (5)	76 (3)	72 ¹⁾ (2.83)	2 (0.08)	168.5 (6.63)	8
	600	38.8 (1.52)	210 (8.27)	22 (0.87)	127 (5)	76 (3)	72 ¹⁾ (2.83)	7 (0.28)	168.5 (6.63)	8
4 inch	150	24.3 (0.96)	230 (9.06)	20 (0.79)	158 (6.22)	94 (3.69)	89 (3.50)	2 (0.08)	190.5 (7.5)	8
	300	32.2 (1.27)	255 (10.04)	22 (0.87)	158 (6.22)	94 (3.69)	89 (3.50)	2 (0.08)	200 (7.87)	8
	400	42 (1.65)	255 (10.04)	26 (1.02)	158 (6.22)	94 (3.69)	89 (3.50)	7 (0.28)	200 (7.87)	8
5 inch	150	24.3 (0.96)	255 (10.04)	22 (0.87)	186 (7.32)	125 (4.92)	124 (4.88)	2 (0.08)	216 (8.50)	8
	300	35.8 (1.41)	280 (11.02)	22 (0.87)	186 (7.32)	125 (4.92)	124 (4.88)	2 (0.08)	235 (9.25)	8
	400	45.1 (1.79)	280 (11.02)	26 (1.02)	186 (7.32)	125 (4.92)	124 (4.88)	7 (0.28)	235 (9.25)	8

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

d_M: Effective diaphragm diameter

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

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
• DN 50	PN 10/16/25/40, PN 100
• DN 80	PN 10/16/25/40, PN 100
• DN 100	PN 10/16, PN 25/40
• 2 inch	Class 150, class 300, class 400/600, class 900/1500
• 3 inch	Class 150, class 300, class 600
• 4 inch	Class 150, class 300, class 400
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 mat. no. 1.4404/316L
• Wetted parts	Stainless steel mat. no. 1.4404/316L
	<ul style="list-style-type: none"> • 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. 1.4404/316L
• Sealing material at the transmitter connection	Copper

Maximum pressure	See above and the technical data of the transmitter
Tube length	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • Silicone oil M5 • Silicone oil M50 • High-temperature oil • Halocarbon oil (for measuring O₂) • Food oil (FDA listed)
Max. recommended process temperature	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)

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seals of flange design mounted directly on transmitter

1

Selection and Ordering data

Article No. Ord. code

Diaphragm seal

7MF4910 -

Directly fitted to a pressure transmitter SITRANS P for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-...¹⁾; must be ordered separately

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

Process connection

- Vertical (pressure transmitter upright)
- Horizontal

0
2

Nominal diameter and nominal pressure

DN 25	PN 10/16/25/40	Z	J 0 A
	PN 63/100/160	Z	J 0 B
DN 40	PN 10/16/25/40	Z	J 0 C
	PN 63/100	Z	J 0 D
	PN 160	Z	J 0 E
• DN 50	PN 10/16/25/40	A	
	PN 100	B	
• DN 80	PN 10/16/25/40	D	
	PN 100	E	
• DN 100	PN 10/16	G	
	PN 25/40	H	
1 inch	class 150	Z	J 6 A
	class 300	Z	J 6 B
	class 400/600	Z	J 6 C
	class 900/1500	Z	J 6 D
1½ inch	class 150	Z	J 6 E
	class 300	Z	J 6 F
	class 400/600	Z	J 6 G
	class 900/1500	Z	J 6 H
• 2 inch	Class 150	L	
	Class 300	M	
	Class 400/600	N	
	Class 900/1500	P	
• 3 inch	Class 150	Q	
	Class 300	R	
	Class 600	S	
• 4 inch	Class 150	T	
	Class 300	U	
	Class 400	V	
JIS DN 50	10 K 316L	Z	J 7 A
	20 K 316L	Z	J 7 B
JIS DN 80	10 K 316L	Z	J 7 C
	20 K 316L	Z	J 7 D

Smooth sealing surface to DIN 1092-01, form B1 or B2, or to ASME B16.5 125 ... 250 AA or RFSF

Other version

Add Order code and plain text:

Nominal diameter: ...; Nominal pressure: ...

Z

J 1 Y

Selection and Ordering data

Article No. Ord. code

Diaphragm seal

7MF4910 -

Directly fitted to a pressure transmitter SITRANS P for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-...¹⁾; must be ordered separately

Wetted parts materials

- Stainless steel 316L
 - without coating
 - with PTFE coating
 - with ECTFE coating^{2) 3)}
 - with PFA coating³⁾
- 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. (max. 150 °C (302 °F))
- Nickel 201 (max. 260 °C (500 °F))
- Duplex 2205, W.-Nr. 1.4462
- Stainless steel 316L, gold plated, thickness approx. 25 µm

A
E 0
F
D
G
J
U
V 0
K
L 0
M 0
Q
S 0

Tube length

- Without tube

0

Other version:

Add Order code and plain text:

Wetted parts materials: ...,

Tube length: ...

Z 8 K 1 Y

Pressure Measurement

Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

Diaphragm seals of flange design mounted directly on transmitter

1

Selection and Ordering data		Article No. Ord. code	Selection and Ordering data	Order code
Diaphragm seal		7MF4910 -	Further designs	
Directly fitted to a pressure transmitter SITRANS P for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... ¹⁾ ; must be ordered separately			Please add "-Z" to Article No. and specify Order code.	
Customer-specific tubus length			Customer-specific tubus length	Y44
Specify customer-specific length with Y44, see Order Code			Select range, enter desired length in plain text (No entry = standard length)	
<ul style="list-style-type: none"> Wetted parts materials: Stainless steel without foil 			Spark arrestor	A01
Range	Standard length		With spark arrestor for mounting on zone 0 (including documentation) for transmitters for gauge pressure and absolute pressure	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	A 1	Remote seal nameplate	B20
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	A 2	Attached out of stainless steel, contains MLFB and order number of the remote seal	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	A 3	Oil- and grease-free cleaned version	C10
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	A 4	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	
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	A 5	Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11
<ul style="list-style-type: none"> Wetted parts materials: Stainless steel coated with ECTFE 			Inspection certificate	C12
Range	Standard length		to EN 10204, section 3.1	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	F 1	2.2 Certificate of FDA approval of fill oil	C17
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	F 2	Only in conjunction with "Food-grade oil" fill liquid (FDA listed)	
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	F 3	Functional safety certificate ("SIL 2") to IEC 61508	C20
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	F 4	(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)	
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	F 5	Functional safety certificate ("SIL 2/3") to IEC 61508	C23
<ul style="list-style-type: none"> Wetted parts materials: Stainless steel coated with PFA 			(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)	
Range	Standard length		Certification acc. to NACE MR-0175	D07
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	D 1	Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")	D 2	Certification acc. to NACE MR-0103	D08
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")	D 3	Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")	D 4	Oil- and grease-free cleaned version	E10
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")	D 5	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	
<ul style="list-style-type: none"> Wetted parts materials: Monel 400 			Epoxy painting	E15
Range	Standard length		Not possible with negative pressure service	
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")	G 1	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.	
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		
<ul style="list-style-type: none"> Wetted parts materials: 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		
<ul style="list-style-type: none"> Wetted parts materials: 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		
Filling liquid				
<ul style="list-style-type: none"> Silicone oil M5 		1		
<ul style="list-style-type: none"> Silicone oil M50 		2		
<ul style="list-style-type: none"> High-temperature oil 		3		
<ul style="list-style-type: none"> Halocarbon oil (for measuring O₂)⁴⁾ 		4		
<ul style="list-style-type: none"> Food oil (FDA listed) 		7		
Other version		9		
Add Order code and plain text:				M1 Y
Filling liquid: ...				

¹⁾ With 7MF802-... and the measuring cells Q, S, T and U also order negative pressure service.

²⁾ For vacuum on request.

³⁾ Only for use in non-hazardous atmospheres.

⁴⁾ Oil- and grease-free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

1

Diaphragm seals of flange design mounted directly on transmitter

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Further designs	
Please add "-Z" to Article No. and specify Order code.		Please add "-Z" to Article No. and specify Order code.	
Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm) previously DIN 2501, form E	J11	Elongated pipe 200 mm instead of 89 mm, max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	R20
Sealing surface groove, EN 1092-1, form D instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)	J14	Elongated pipe elbow 200 mm instead of 130 mm, max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	R21
Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	J30 J31 J32 J33 J34 J35	Cooling element max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	R22
Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	J40 J41 J42 J43 J44 J45	Negative pressure service for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series	V01
Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	J50 J51 J52 J53 J54 J55	Extended negative pressure service for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series	V51
Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA Instead of sealing surface B2 and RFSF (Only for wetted parts in Hastelloy C276 (2.4819), Tantal and Duplex 2205 (1.4462) and for 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		

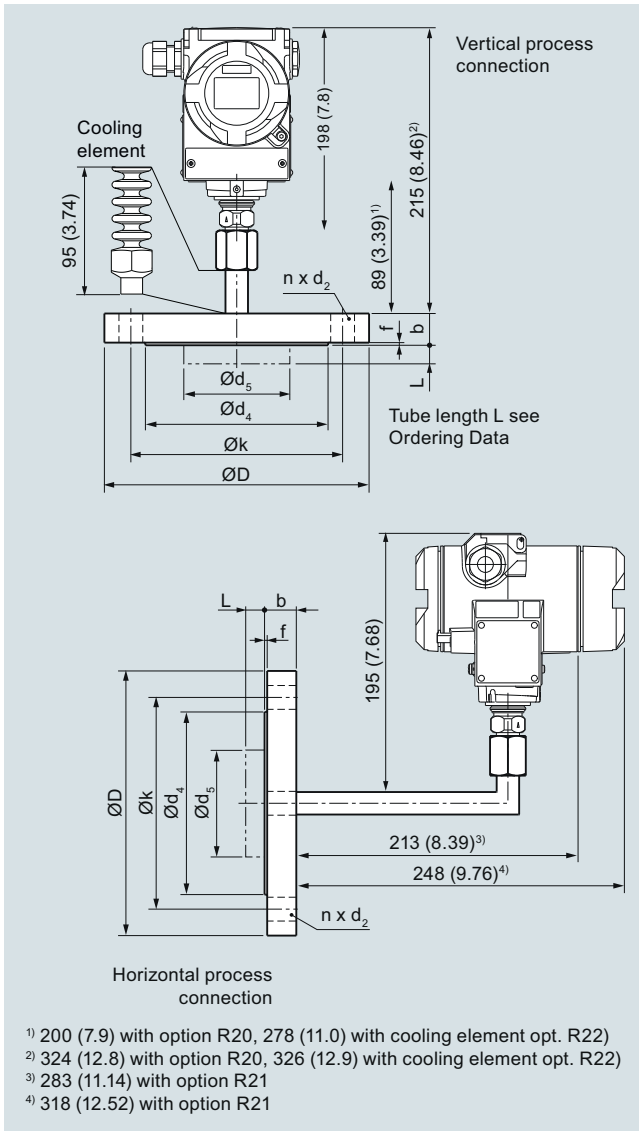
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seals of flange design mounted directly on transmitter

1

Dimensional drawings



Diaphragm seals of flange design, direct connection to a SITRANS P pressure transmitter (process connection vertical (top) and horizontal (bottom)), dimensions in mm (inch)

Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d ₂	d ₄	d ₅	d _M	f	k	n
		mm	mm	mm	mm	mm	mm	mm	mm	
DN 50	PN 10/16/25/40	20	165	18	102	48.3	45 ¹⁾	2	125	4
	PN 100	28	195	26	102	48.3	45 ¹⁾	2	145	4
DN 80	PN 10/16/25/40	24	200	18	138	76	72 ¹⁾	2	160	8
	PN 100	32	230	26	138	76	72 ¹⁾	2	180	8
DN 100	PN 10/16	20	220	18	158	94	89-2	2	180	8
	PN 25/40	24	235	22	162	94	89	2	190	8

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d ₂	d ₄	d ₅	d _M	f	k	n
lb/sq.in.		mm	mm	mm	mm	mm	mm	mm	mm	
(inch)		(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	
2 inch	150	19.5	150	20	92	48.3	45 ¹⁾	2	120.5	4
		(0.77)	(5.91)	(0.79)	(3.62)	(1.9)	(1.77) ¹⁾	(0.08)	(4.74)	
	300	22.7	165	20	92	48.3	45 ¹⁾	2	127	8
		(0.89)	(6.5)	(0.79)	(3.62)	(1.9)	(1.77) ¹⁾	(0.08)	(5)	
	400/600	32.4	165	20	92	48.3	45 ¹⁾	7	127	8
		(1.28)	(6.5)	(0.79)	(3.62)	(1.9)	(1.77) ¹⁾	(0.28)	(5)	
	900/1500	45.1	215	26	92	48.3	45 ¹⁾	7	165	8
		(1.78)	(8.46)	(1.02)	(3.62)	(1.9)	(1.77) ¹⁾	(0.28)	(6.5)	
3 inch	150	24.3	190	20	127	76	72 ²⁾	2	152.5	4
		(0.96)	(7.48)	(0.79)	(5)	(3)	(2.83) ²⁾	(0.08)	(6)	
	300	29	210	22	127	76	72 ²⁾	2	168.5	8
		(1.14)	(8.27)	(0.87)	(5)	(3)	(2.83) ²⁾	(0.08)	(6.63)	
	600	38.8	210	22	127	76	72 ²⁾	7	168.5	8
		(1.53)	(8.27)	(0.87)	(5)	(3)	(2.83) ²⁾	(0.28)	(6.63)	
4 inch	150	24.3	230	20	158	94	89	2	190.5	8
		(0.96)	(9.06)	(0.79)	(6.22)	(3.69)	(3.50)	(0.08)	(7.5)	
	300	32.2	255	22	158	94	89	2	200	8
		(1.27)	(10.04)	(0.79)	(6.22)	(3.69)	(3.50)	(0.08)	(7.87)	
	400	42	255	26	158	94	89	7	200	8
		(1.65)	(10.04)	(1.02)	(6.22)	(3.69)	(3.50)	(0.28)	(7.87)	

d: Inside diameter of gasket according to EN 1092-1/
ASME B16.5

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

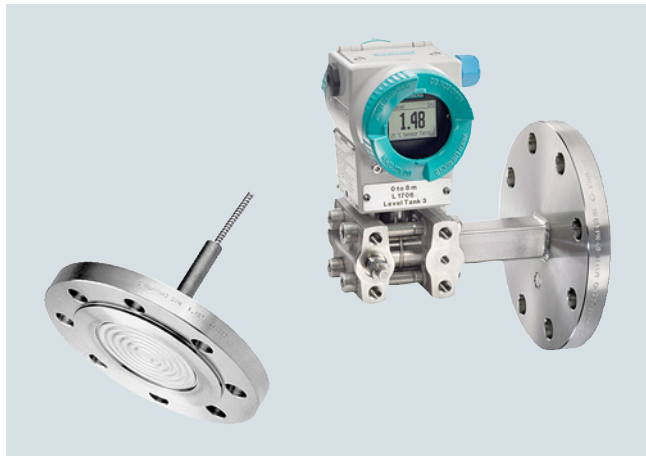
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

1

Diaphragm seals of flange design mounted directly and with capillary

Overview



Diaphragm seals of screwed 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
• DN 50	PN 10/16/25/40, PN 100
• DN 80	PN 10/16/25/40
• DN 100	PN 10/16, PN 25/40
• 2 inch	Class 150, class 300, class 400/600, class 900/1500
• 3 inch	Class 150, class 300
• 4 inch	Class 150, class 300
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
	<ul style="list-style-type: none"> • 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 process temperature	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)



Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seals of flange design mounted directly and with capillary

1

Selection and Ordering data		Article No. Ord. code	
Diaphragm seal		7MF4913 -	
Mounting flange (with tube as option) for direct mounting to high-pressure side and flanged remote seal without tube , fitted by means of capillary to low-pressure side of SITRANS P for differential pressure; SITRANS P DS III series and P410 (7MF443.-...) and SITRANS P500 (7MF54.-...)		1  - B 	
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.			
Flange, connection to EN 1092-1			
Nominal diameter and nominal pressure			
• DN 25	PN 10/16/25/40	Z	J 0 A
	PN 63/100/160	Z	J 0 B
• DN 40	PN 10/16/25/40	Z	J 0 C
	PN 63/100	Z	J 0 D
	PN 160	Z	J 0 E
• 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	
Flange, connection to ASME B16.5			
Nominal diameter and nominal pressure			
• 1 inch	Class 150	Z	J 6 A
	Class 300	Z	J 6 B
	Class 400/600	Z	J 6 C
	Class 900/1500	Z	J 6 D
• 1½ inch	Class 150	Z	J 6 E
	Class 300	Z	J 6 F
	Class 400/600	Z	J 6 G
	Class 900/1500	Z	J 6 H
• 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 and nominal pressure			
• JIS DN 50	10 K 316L	Z	J 7 A
	20 K 316L	Z	J 7 B
• JIS DN 80	10 K 316L	Z	J 7 C
	20 K 316L	Z	J 7 D
Other version		Z	J 1 Y
Add Order code and plain text: Flange: ..., Nominal diameter: ...; Nominal pressure: ...			

Selection and Ordering data		Article No. Ord. code	
Diaphragm seal		7MF4913 -	
Mounting flange (with tube as option) for direct mounting to high-pressure side and flanged remote seal without tube , fitted by means of capillary to low-pressure side of SITRANS P for differential pressure; SITRANS P DS III series and P410 (7MF443.-...) and SITRANS P500 (7MF54.-...)		1  - B 	
Wetted parts materials			
Smooth sealing surface to EN 1092-1, form B1 or B2, or to ASME B16.5 RF 125 ... 250 AA or RFSF			
<ul style="list-style-type: none"> Stainless steel 316L <ul style="list-style-type: none"> without coating with PTFE coating with ECTFE coating^{1) 2)} with PFA coating²⁾ 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 (max. 150 °C (302 °F)) Nickel 201 (max. 260 °C (500 °F)) Duplex, mat. no. 1.4462 Duplex, mat. no. 1.4462, incl. main body Stainless steel 316L, gold plated, thickness approx. 25 µm 		A E 0 F D G J U V 0 K L 0 M 0 Q R S 0	

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seals of flange design mounted directly and with capillary

1

Selection and Ordering data

Article No. Ord. code

Diaphragm seal

7MF4913 -

Mounting flange (with tube as option) for direct mounting to high-pressure side **and flanged remote seal without tube**, fitted by means of capillary to low-pressure side of SITRANS P for differential pressure; SITRANS P DS III series and P410 (7MF443-...) and SITRANS P500 (7MF54-...)

1 ■ ■ ■ ■ - ■ B ■ ■ ■ ■

Tube length

(for mounting flange on high-pressure side)

- Without tube

0

Other version:

Add Order code and plain text:

Wetted parts materials:,

Tube length: ...

Z 8

K 1 Y

Customer-specific tubus length

Specify customer-specific length with Y44, see Order Code

- Wetted parts materials: Stainless steel without foil Range

Range	Standard length
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")

A 1

A 2

A 3

A 4

A 5

- Wetted parts materials: Stainless steel coated with ECTFE

Range	Standard length
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")

F 1

F 2

F 3

F 4

F 5

- Wetted parts materials: Stainless steel coated with PFA

Range	Standard length
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")
201 ... 250 mm (7.91 ... 9.84")	250 mm (9.84")

D 1

D 2

D 3

D 4

D 5

- Wetted parts materials: Monel 400

Range	Standard length
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")

G 1

G 2

G 3

G 4

- Wetted parts materials: Hastelloy C276

Range	Standard length
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")

J 1

J 2

J 3

J 4

- Wetted parts materials: Tantalum

Range	Standard length
20 ... 50 mm (0.79 ... 1.97")	50 mm (1.97")
51 ... 100 mm (2.01 ... 3.94")	100 mm (3.94")
101 ... 150 mm (3.98 ... 5.91")	150 mm (5.91")
151 ... 200 mm (5.94 ... 7.87")	200 mm (7.87")

K 1

K 2

K 3

K 4

Selection and Ordering data

Article No. Ord. code

Diaphragm seal

7MF4913 -

Mounting flange (with tube as option) for direct mounting to high-pressure side **and flanged remote seal without tube**, fitted by means of capillary to low-pressure side of SITRANS P for differential pressure; SITRANS P DS III series and P410 (7MF443-...) and SITRANS P500 (7MF54-...)

1 ■ ■ ■ ■ - ■ B ■ ■ ■ ■

Filling liquid

- Silicone oil M5
- Silicone oil M50
- High-temperature oil
- Halocarbon oil (for measuring O₂)³⁾
- Food oil (FDA listed)

1

2

3

4

7

Other version

Add Order code and plain text:

Filling liquid: ...

9

M 1 Y

Length of capillary⁴⁾

- 1.0 m (3.28 ft)
- 1.6 m (5.25 ft)
- 2.5 m (8.20 ft)
- 4.0 m (13.1 ft)
- 6.0 m (19.7 ft)
- 8.0 m (26.25 ft)
- 10.0 m (32.8 ft)

2

3

4

5

6

7

8

Special lengths for capillaries

- 2.0 m (6.56 ft)
- 3.0 m (9.84 ft)
- 5.0 m (16.40 ft)
- 7.0 m (23.97 ft)
- 9.0 m (29.53 ft)

9

N 1 C

9

N 1 E

9

N 1 G

9

N 1 J

9

N 1 L

1) For vacuum on request.

2) Only for use in non-hazardous atmospheres.

3) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.

4) Max. capillary length, see section "Technical description".

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seals of flange design mounted directly and with capillary

1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code.		Further designs Please 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	Sealing surface smooth, form B2 or RFSF (Stainless steel diaphragm) previously DIN 2501, form E	J11
Spark arrestor With spark arrestor for mounting on zone 0 (including documentation)	A02	Sealing surface groove, EN 1092-1, form D instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)	J14
Remote seal nameplate Attached out of stainless steel, contains MLFB and order number of the remote seal	B20	Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	J30 J31 J32 J33 J34 J35
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	Sealing surface with male face according to EN 1092-1, form E (previously DIN 2512, form V13) in stainless steel 316L DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	J40 J41 J42 J43 J44 J45
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11		
Inspection certificate to EN 10204, section 3.1	C12		
2.2 Certificate of FDA approval of fill oil Only in conjunction with "Food-grade oil" fill liquid (FDA listed)	C17		
Functional safety certificate ("SIL 2") to IEC 61508 (Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)	C20	Sealing surface with female face according to EN 1092-1, form F (previously DIN 2512, form R13) in stainless steel 316L DN 25 DN 40 DN 50 DN 80 DN 100 DN 125	J50 J51 J52 J53 J54 J55
Functional safety certificate ("SIL 2/3") to IEC 61508 (Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)	C23		J12
Certification acc. to NACE MR-0175 Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	D07	Sealing surface B1 or ASME B16.5 RF 125 ... 250 AA Instead of sealing surface B2 and RFSF (Only for wetted parts in Hastelloy C276 (2.4819), Tantal and Duplex 2205 (1.4462) and for sizes 2", 3", DN 50 and DN 80)	
Certification acc. to NACE MR-0103 Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	D08	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
Oil- and grease-free cleaned version Oil- and grease-free cleaned and packed version, <u>only for oxygen application</u> , 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		

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

1

Diaphragm seals of flange design mounted directly and with capillary

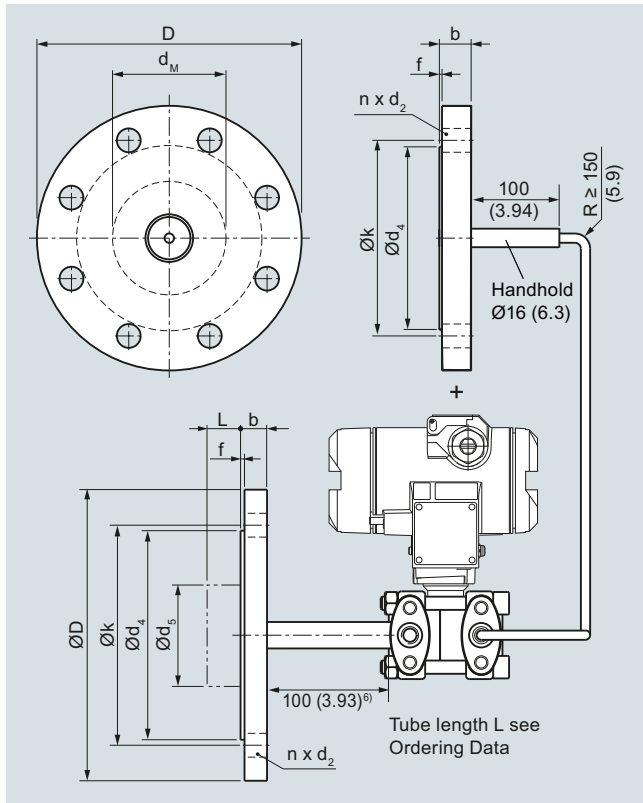
Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Further designs	
Please add "-Z" to Article No. and specify Order code.		Please add "-Z" to Article No. and specify Order code.	
Radial capillary pipe outlet for one-sided mounting	K01	PVC protective tube over the spiral protective tube of the capillaries (color: black)	
PE protective tube over the spiral protective tube of the capillaries (color: white)		1.0 m (3.28 ft)	N60
1.0 m (3.28 ft)	N20	1.6 m (5.25 ft)	N61
1.6 m (5.25 ft)	N21	2.0 m (6.56 ft)	N62
2.0 m (6.56 ft)	N22	2.5 m (8.20 ft)	N63
2.5 m (8.20 ft)	N23	3.0 m (9.84 ft)	N64
3.0 m (9.84 ft)	N24	4.0 m (13.12 ft)	N65
4.0 m (13.12 ft)	N25	5.0 m (16.40 ft)	N66
5.0 m (16.40 ft)	N26	6.0 m (19.69 ft)	N67
6.0 m (19.69 ft)	N27	7.0 m (22.97 ft)	N68
7.0 m (22.97 ft)	N28	8.0 m (26.25 ft)	N69
8.0 m (26.25 ft)	N29	9.0 m (29.53 ft)	N70
9.0 m (29.53 ft)	N30	10.0 m (32.81 ft)	N71
10.0 m (32.81 ft)	N31	Elongated pipe, distance from transmitter process flange to flange is 150 mm instead of 100 mm, max. medium temperature 250 °C, observe the maximum permissible media temperature of the filling liquid.	R15
PTFE protective tube over the spiral protective tube of the capillaries (color: transparent)		Elongated pipe, distance from transmitter process flange to flange is 100 mm instead of 100 mm, max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	R20
1.0 m (3.28 ft)	N40	Negative pressure service for use in low-pressure range for transmitters for • differential pressure	V03
1.6 m (5.25 ft)	N41	Extended negative pressure service for use in low-pressure range for transmitters for • differential pressure	V53
2.0 m (6.56 ft)	N42		
2.5 m (8.20 ft)	N43		
3.0 m (9.84 ft)	N44		
4.0 m (13.12 ft)	N45		
5.0 m (16.40 ft)	N46		
6.0 m (19.69 ft)	N47		
7.0 m (22.97 ft)	N48		
8.0 m (26.25 ft)	N49		
9.0 m (29.53 ft)	N50		
10.0 m (32.81 ft)	N51		

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seals of flange design mounted directly and with capillary

Dimensional drawings



Diaphragm seals of screwed design with flexible capillary, fixed connection, for connection to a SITRANS P pressure transmitter for differential pressure, dimensions in mm (inch)

Connection to EN 1092-1

Nom. diam.	Nom. press.	b	D	d ₂	d ₄	d ₅	d _M	f	k	n
		mm	mm	mm	mm	mm	mm	mm	mm	
DN 50	PN 10/16/25/40	20	165	18	102	48.3	45 ¹⁾	2	125	4
	PN 100	28	195	26	102	48.3	45 ¹⁾	2	145	4
DN 80	PN 10/16/25/40	24	200	18	138	76	72 ²⁾	2	160	8
	PN 100	32	230	26	138	76	72 ²⁾	2	180	8
DN 100	PN 10/16	20	220	18	158	94	89	2	180	8
	PN 25/40	24	235	22	162	94	89	2	190	8

Connection to ASME B16.5

Nom. diam.	Nom. press.	b	D	d ₂	d ₄	d ₅	d _M	f	k	n
		mm	mm	mm	mm	mm	mm	mm	mm	
	lb/sq.in.	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	(inch)	
2 inch	150	19.5	150	20	92	48.3	45 ¹⁾	2	120.5	4
		(0.77)	(5.91)	(0.79)	(3.62)	(1.9)	(1.77) ¹⁾	(0.08)	(4.74)	
	300	22.7	165	20	92	48.3	45 ¹⁾	2	127	8
		(0.89)	(6.5)	(0.79)	(3.62)	(1.9)	(1.77) ¹⁾	(0.08)	(5)	
	400/600	32.4	165	20	92	48.3	45 ¹⁾	7	127	8
		(1.28)	(6.5)	(0.79)	(3.62)	(1.9)	(1.77) ¹⁾	(0.28)	(5)	
	900/1500	45.1	215	26	92	48.3	45 ¹⁾	7	165	8
		(1.78)	(8.46)	(1.02)	(3.62)	(1.9)	(1.77) ¹⁾	(0.28)	(6.5)	
3 inch	150	24.3	190	20	127	76	72 ²⁾	2	152.5	4
		(0.96)	(7.48)	(0.79)	(5)	(3)	(2.83) ²⁾	(0.08)	(6)	
	300	29	210	22	127	76	72 ²⁾	2	168.5	8
		(1.14)	(8.27)	(0.87)	(5)	(3)	(2.83) ²⁾	(0.08)	(6.63)	
4 inch	150	24.3	230	20	158	94	89	2	190.5	8
		(0.96)	(9.06)	(0.79)	(6.22)	(3.69)	(3.50)	(0.08)	(7.5)	
	300	32.2	255	22	158	94	89	2	200	8
		(1.27)	(10.04)	(0.79)	(6.22)	(3.69)	(3.50)	(0.08)	(7.87)	

d: Inside diameter of gasket according to EN 1092-1 / ASME B16.5

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

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

1

Diaphragm seal, screwed design, mounted directly or/and with capillary

Overview



Diaphragm seal, screwed gland design with inside diaphragm for gauge, absolute and differential pressure for direct mounting



Process connection: open measurement flange

Technical specifications

Diaphragm seal, screwed gland with inside diaphragm

Process connection	Nominal pressure
• Male thread G $\frac{1}{2}$ B to EN 837-1	PN 100, PN 250
• External thread $\frac{1}{2}$ -14" NPT-M	PN 100, PN 250
• open measurement flange	
- DN 25	PN 10 ... PN 40
- 1 inch	Class 150, class 300
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
	<ul style="list-style-type: none"> • 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 μ m
• Top section (process connection in the case of an open measurement flange)	Stainless steel, mat. no. 1.4404/316L
• Capillary	Stainless steel, mat. no. 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	<ul style="list-style-type: none"> • Silicone oil M5 • Silicone oil M50 • High-temperature oil • Halocarbon oil (for measuring O₂) • Food oil (FDA listed)
Max. recommended process temperature	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)

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seal, screwed design, mounted directly or/and with capillary

1

Selection and Ordering data			Article No. Ord. Code	
Remote seal, screwed gland with inside diaphragm				
Mounted on SITRANS P pressure transmitter for			7MF4930 -	
<ul style="list-style-type: none"> gauge pressure 7MF2033-...; 7MF403-... and SITRANS P300, 7MF802-... absolute pressure 7MF423-... and SITRANS P300, 7MF802-... In conjunction with Order code "V01" (vacuum-proof design)				
Mounted on either side of SITRANS P pressure transmitter for			7MF4933 -	
<ul style="list-style-type: none"> differential pressure 7MF243-...; 7MF443-... and 7MF54-... 				
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				
Type				
<ul style="list-style-type: none"> no flushing hole with flushing hole 1x 1/8 NPT unsealed (only with process connection 316L) 			1 2	
Other version, add Order code and plain text: Version: ...			9 H 1 Y	
Process connection version				
Lower flange material	Process connection	Nominal diameter and pressure level		
316L/1.4404	Thread	G½B/PN100	B	
316L/1.4404	Thread	G½B/PN250	C	
316L/1.4404	Thread	½NPT-M/PN100	E	
316L/1.4404	Thread	½NPT-M/PN250	F	
316L/1.4404	Thread	½NPT-F/PN100	H	
316L/1.4404	Thread	½NPT-F/PN250	J	
316L/1.4404	open measure-ment flange	DN 25/ PN 10 ... 40	N	
316L/1.4404	open measure-ment flange	1"/Class 150	P	
316L/1.4404	open measure-ment flange	1"/Class 300	Q	
PTFE ¹⁾	Thread	G½B/PN100	T	
PTFE ¹⁾	open measure-ment flange	DN 25/ PN 10 ... 40	U	
PTFE ¹⁾	open measure-ment flange	1"/Class 150	V	
PTFE ¹⁾	open measure-ment flange	1"/Class 300	W	
Other version, add Order code and plain text: Lower flange material: ...; Process connection: ...; Nominal diameter/pressure level: ...			Z J 1 Y	
Diaphragm material				
Stainless steel 316L			A	
316L stainless steel with PTFE film			E	
Monel 400			G	
Hastelloy C276			J	
Hastelloy C4			U	
Tantalum			K	
Stainless steel 316L, gold plated, thickness approx. 25 µm			S	
Other version, add Order code and plain text: Diaphragm material: ...			Z K 1 Y	
Selection and Ordering data			Article No. Ord. Code	
Remote seal, screwed gland with inside diaphragm				
Mounted on SITRANS P pressure transmitter for			7MF4930 -	
<ul style="list-style-type: none"> gauge pressure 7MF2033-...; 7MF403-... and SITRANS P300, 7MF802-... absolute pressure 7MF423-... and SITRANS P300, 7MF802-... In conjunction with Order code "V01" (vacuum-proof design)				
Mounted on either side of SITRANS P pressure transmitter for			7MF4933 -	
<ul style="list-style-type: none"> differential pressure 7MF243-...; 7MF443-... and 7MF54-... 				
↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				
Sealing material between top and bottom section				
FKM (standard with diaphragm and 316L process connection)			1	
PTFE (standard with custom material with max. 260 °C (500 °F))			2	
Metal C- circlip, silver coated for > 260 °C (500 °F) incl. high temperature-resistant screwed gland			3	
Filling liquid				
<ul style="list-style-type: none"> Silicone oil M5 Silicone oil M50 High-temperature oil Halocarbon oil (for measuring O₂)²⁾ Food oil (FDA-listed) 			1 2 3 4 7	
Other version, add Order code and plain text: filling liquid: ...			9 M 1 Y	
Capillary length³⁾				
<ul style="list-style-type: none"> none, direct mounting none, direct mounting with cooling element (not in conjunction with transmitter for differential pressure) 1.0 m (3.28 ft) 1.6 m (5.25 ft) 2.5 m (8.20 ft) 4.0 m (13.1 ft) 6.0 m (19.7 ft) 8.0 m (26.25 ft) 10.0 m (32.8 ft) 			0 1 2 3 4 5 6 7 8	
Special lengths for capillaries				
<ul style="list-style-type: none"> 2.0 m (6.56 ft) 3.0 m (9.84 ft) 5.0 m (16.40 ft) 7.0 m (23.97 ft) 9.0 m (29.53 ft) 			9 N 1 C 9 N 1 E 9 N 1 G 9 N 1 J 9 N 1 L	
1) Not in combination with flushing holes. Not together with the options for negative pressure service (V01 and V03) and extended negative pressure service (V51 and V53).				
2) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10.				
3) Max. capillary length, see section "Technical description".				

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

1

Diaphragm seal, screwed design, mounted directly or/and with capillary

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Further designs	
Add "-Z" to Article No. and specify Order code.		Add "-Z" to Article No. and specify Order code.	
Remote seal nameplate Attached out of stainless steel, contains MLFB and order number of the remote seal	B20	PE protective tube over the spiral protective tube of the capillaries (color: white)	
Oil- and grease-free cleaned version Oil- and grease-free cleaned and packed version, <u>not for oxygen application</u> , only in conjunction with halocarbon oil fill fluid, certified by certificate acc. to EN 10204-2.2	C10	1.0 m (3.28 ft)	N20
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11	1.6 m (5.25 ft)	N21
Inspection certificate to EN 10204, section 3.1	C12	2.0 m (6.56 ft)	N22
2.2 Certificate of FDA approval of fill oil Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"	C17	2.5 m (8.20 ft)	N23
Functional safety certificate ("SIL 2") to IEC 61508 (Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)	C20	3.0 m (9.84 ft)	N24
Functional safety certificate ("SIL 2/3") to IEC 61508 (Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)	C23	4.0 m (13.12 ft)	N25
Certification acc. to NACE MR-0175 Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	D07	5.0 m (16.40 ft)	N26
Certification acc. to NACE MR-0103 Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	D08	6.0 m (19.69 ft)	N27
Oil- and grease-free cleaned version Oil- and grease-free cleaned and packed version, <u>only for oxygen application</u> , 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	7.0 m (22.97 ft)	N28
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	8.0 m (26.25 ft)	N29
One-sided mounting on differential pressure transmitters (only for 7MF4930-...) on high-pressure side on low-pressure side	H10 H11	9.0 m (29.53 ft)	N30
Sealing surface groove, EN 1092-1, form D instead of sealing surface B1 (only for wetted parts made of stainless steel 316L)	J14	10.0 m (32.81 ft)	N31
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	PTFE protective tube over the spiral protective tube of the capillaries (color: transparent)	
Sealing surface with spring according to EN 1092-1, form C, (previously DIN 2512, form F) in stainless steel 316L DN 25 DN 40	J30 J31	1.0 m (3.28 ft)	N40
		1.6 m (5.25 ft)	N41
		2.0 m (6.56 ft)	N42
		2.5 m (8.20 ft)	N43
		3.0 m (9.84 ft)	N44
		4.0 m (13.12 ft)	N45
		5.0 m (16.40 ft)	N46
		6.0 m (19.69 ft)	N47
		7.0 m (22.97 ft)	N48
		8.0 m (26.25 ft)	N49
		9.0 m (29.53 ft)	N50
		10.0 m (32.81 ft)	N51
		PVC protective tube over the spiral protective tube of the capillaries (color: black)	
		1.0 m (3.28 ft)	N60
		1.6 m (5.25 ft)	N61
		2.0 m (6.56 ft)	N62
		2.5 m (8.20 ft)	N63
		3.0 m (9.84 ft)	N64
		4.0 m (13.12 ft)	N65
		5.0 m (16.40 ft)	N66
		6.0 m (19.69 ft)	N67
		7.0 m (22.97 ft)	N68
		8.0 m (26.25 ft)	N69
		9.0 m (29.53 ft)	N70
		10.0 m (32.81 ft)	N71
		Negative pressure service for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series • differential pressure	V01 V03
		Extended negative pressure service for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series • differential pressure	V51 V53

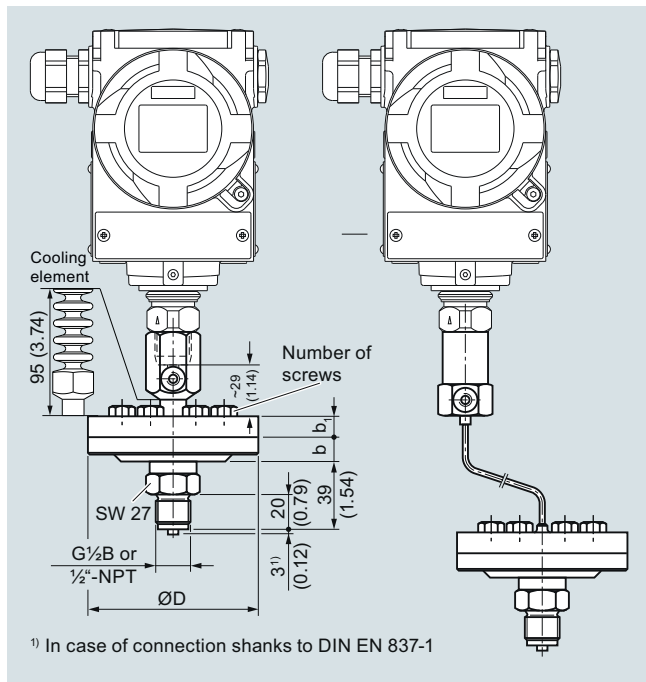
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Diaphragm seal, screwed design, mounted directly or/and with capillary

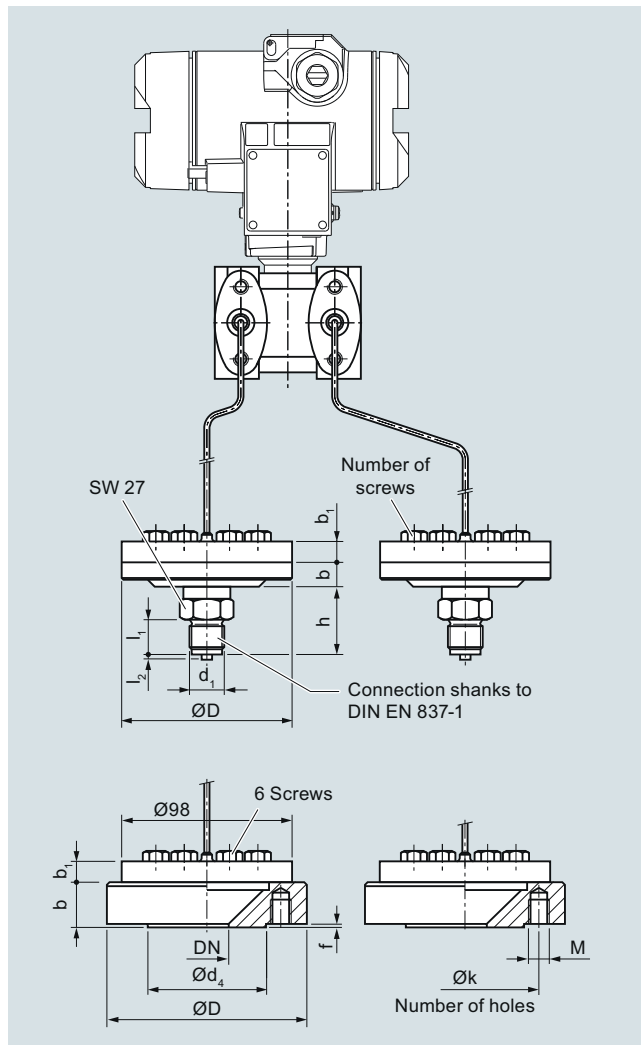
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Dimensional drawings



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)

Nomi- nal diam- eter	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	108	50.8	79.2	M12	4	22	12	1.6
1 inch	300 lb/sq.in	124	50.8	88.9	M16	4	22	12	1.6

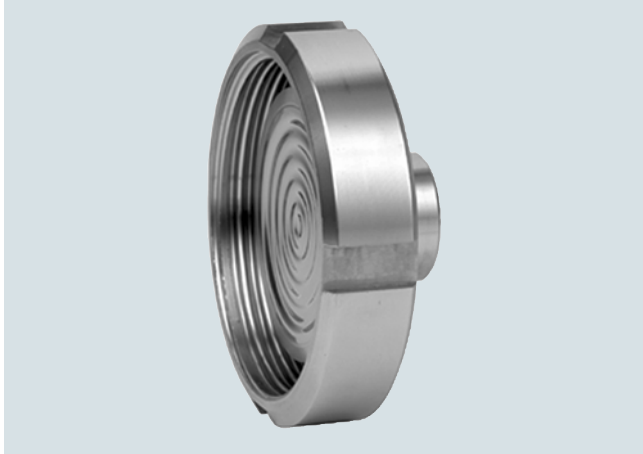
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Quick-release diaphragm seals

1

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 measured 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
<u>For pressure</u>	
• To DIN 11851 with slotted union nut	
- DN 25	PN 40
- DN 32	PN 40
- DN 40	PN 40
- DN 50	PN 25
- DN 65	PN 25
- DN 80	PN 25
• To DIN 11851 with threaded socket	
- DN 25	PN 40
- DN 32	PN 40
- DN 40	PN 40
- DN 50	PN 25
- DN 65	PN 25
- DN 80	PN 25

• Clamp connection	
- 1½ inch	PN 16
- 2 inch	PN 16
- 2½ inch	PN 16
- 3 inch	PN 10
<u>For differential pressure and flow</u>	
• To DIN 11851 with slotted union nut	
- DN 50	PN 25
- DN 65	PN 25
- DN 80	PN 25
• To DIN 11851 with threaded socket	
- DN 50	PN 25
- DN 65	PN 25
- DN 80	PN 25
• Clamp connection	
- 2 inch	PN 16
- 2½ inch	PN 16
- 3 inch	PN 10
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. 1.4404/316L
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. 1.4301/316
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

Pressure Measurement

Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

Quick-release diaphragm seals

1

Selection and Ordering data		Article No. Ord. code		Selection and Ordering data	Ord. code
Quick-release diaphragm seal		7MF4940 -		Further designs	
for SITRANS P pressure transmitters for pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... ¹⁾ ; must be ordered separately Filling liquid: Food oil (FDA listed) Material: Stainless steel, mat. No. 1.4435		A 0 - B		Please add "-Z" to Article No. and specify Order code.	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				Remote seal nameplate	B20
				Attached out of stainless steel, contains MLFB and order number of the remote seal	
				Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11
				Inspection certificate	C12
				to EN 10204, section 3.1	
				2.2 Certificate of FDA approval of fill oil	C17
				Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"	
				Functional safety certificate ("SIL 2") to IEC 61508	C20
				(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)	
				Functional safety certificate ("SIL 2/3") to IEC 61508	C23
				(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)	
				One-sided mounting on differential pressure transmitters	
				(only for 7MF4940-...)	
				on high-pressure side	H10
				on low-pressure side	H11
				PE protective tube	
				over the spiral protective tube of the capillaries (color: white)	
				1.0 m (3.28 ft)	N20
				1.6 m (5.25 ft)	N21
				2.0 m (6.56 ft)	N22
				2.5 m (8.20 ft)	N23
				3.0 m (9.84 ft)	N24
				4.0 m (13.12 ft)	N25
				5.0 m (16.40 ft)	N26
				6.0 m (19.69 ft)	N27
				7.0 m (22.97 ft)	N28
				8.0 m (26.25 ft)	N29
				9.0 m (29.53 ft)	N30
				10.0 m (32.81 ft)	N31
				PTFE protective tube	
				over the spiral protective tube of the capillaries (color: transparent)	
				1.0 m (3.28 ft)	N40
				1.6 m (5.25 ft)	N41
				2.0 m (6.56 ft)	N42
				2.5 m (8.20 ft)	N43
				3.0 m (9.84 ft)	N44
				4.0 m (13.12 ft)	N45
				5.0 m (16.40 ft)	N46
				6.0 m (19.69 ft)	N47
				7.0 m (22.97 ft)	N48
				8.0 m (26.25 ft)	N49
				9.0 m (29.53 ft)	N50
				10.0 m (32.81 ft)	N51
Nom. diam. Nom. press.					
• Connection to DIN 11851 with slotted union nut					
- DN 25	PN 40	1 B			
- DN 32	PN 40	1 C			
- DN 40	PN 40	1 D			
- DN 50	PN 25	1 E			
- DN 65	PN 25	1 F			
- DN 80	PN 25	1 G			
• Connection to DIN 11851 with screw necks					
- DN 25	PN 40	2 B			
- DN 32	PN 40	2 C			
- DN 40	PN 40	2 D			
- DN 50	PN 25	2 E			
- DN 65	PN 25	2 F			
- DN 80	PN 25	2 G			
• Tri-Clamp connection to DIN 32676/ISO 2852					
- DN 40/1½ inch	PN 16	4 L			
- DN 50/2 inch	PN 16	4 M			
- DN 65/2½ inch	PN 16	4 N			
- DN 80/3 inch	PN 10	4 P			
Other version Add Order codes and plain text: Process connection: ..., Nominal diameter: ...; Nominal pressure: ...		9 A		H 1 Y	
Filling liquid					
• Food oil (FDA listed)		7			
Other version Add Order code and plain text: Filling liquid: ...		9		M 1 Y	
Connection to pressure transmitter					
• direct		0			
through capillary, length: ²⁾					
• 1.0 m (3.28 ft)		2			
• 1.6 m (5.25 ft)		3			
• 2.5 m (8.20 ft)		4			
• 4.0 m (13.1 ft)		5			
• 6.0 m (19.7 ft)		6			
• 8.0 m (26.25 ft)		7			
• 10.0 m (32.8 ft)		8			
Special lengths for capillaries					
• 2.0 m (6.56 ft)		9	N 1 C		
• 3.0 m (9.84 ft)		9	N 1 E		
• 5.0 m (16.40 ft)		9	N 1 G		
• 7.0 m (23.97 ft)		9	N 1 J		
• 9.0 m (29.53 ft)		9	N 1 L		

¹⁾ With 7MF802-... and the measuring cells Q, S, T and U also order the vacuum-tight version.

²⁾ Max. capillary length, see section "Technical description"

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Quick-release diaphragm seals

Selection and Ordering data	Ord. code
Further designs	
Please add "-Z" to Article No. and specify Order code.	
PVC protective tube over the spiral protective tube of the capillaries (color: black)	
1.0 m (3.28 ft)	N60
1.6 m (5.25 ft)	N61
2.0 m (6.56 ft)	N62
2.5 m (8.20 ft)	N63
3.0 m (9.84 ft)	N64
4.0 m (13.12 ft)	N65
5.0 m (16.40 ft)	N66
6.0 m (19.69 ft)	N67
7.0 m (22.97 ft)	N68
8.0 m (26.25 ft)	N69
9.0 m (29.53 ft)	N70
10.0 m (32.81 ft)	N71
Cooling element max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	R22
Negative pressure service for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series	V01
Extended negative pressure service for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series	V51

Selection and Ordering data		Article No.	Ord. code	Selection and Ordering data	Order code
Quick-release diaphragm seal		7 M F 4 9 4 3 -		Further designs	
for SITRANS P pressure transmitters for pressure for differential pressure and flow, type 7MF243...; 7MF443... and 7MF54...; order separately Filling liquid: Food oil (FDA listed) Material: Stainless steel, mat. No. 1.4435 Delivery unit: 2 off		A 0 - B		Please add "-Z" to Article No. and specify Order code.	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				Remote seal nameplate	B20
				Attached out of stainless steel, contains MLFB and order number of the remote seal	
				Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11
				Inspection certificate to EN 10204, section 3.1	C12
				2.2 Certificate of FDA approval of fill oil Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"	C17
				Functional safety certificate ("SIL 2") to IEC 61508 (Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)	C20
				Functional safety certificate ("SIL 2/3") to IEC 61508 (Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)	C23
				PE protective tube over the spiral protective tube of the capillaries (color: white)	
				1.0 m (3.28 ft)	N20
				1.6 m (5.25 ft)	N21
				2.0 m (6.56 ft)	N22
				2.5 m (8.20 ft)	N23
				3.0 m (9.84 ft)	N24
				4.0 m (13.12 ft)	N25
				5.0 m (16.40 ft)	N26
				6.0 m (19.69 ft)	N27
				7.0 m (22.97 ft)	N28
				8.0 m (26.25 ft)	N29
				9.0 m (29.53 ft)	N30
				10.0 m (32.81 ft)	N31
				PTFE protective tube over the spiral protective tube of the capillaries (color: transparent)	
				1.0 m (3.28 ft)	N40
				1.6 m (5.25 ft)	N41
				2.0 m (6.56 ft)	N42
				2.5 m (8.20 ft)	N43
				3.0 m (9.84 ft)	N44
				4.0 m (13.12 ft)	N45
				5.0 m (16.40 ft)	N46
				6.0 m (19.69 ft)	N47
				7.0 m (22.97 ft)	N48
				8.0 m (26.25 ft)	N49
				9.0 m (29.53 ft)	N50
				10.0 m (32.81 ft)	N51
Nom. diam.					
Nom. press.					
<ul style="list-style-type: none"> Connection to DIN 11851 with slotted union nut <ul style="list-style-type: none"> - DN 50 PN 25 - DN 65 PN 25 - DN 80 PN 25 Connection to DIN 11851 with threaded socket <ul style="list-style-type: none"> - DN 50 PN 25 - DN 65 PN 25 - DN 80 PN 25 Tri-Clamp connection to DIN 32676/ ISO 2852 <ul style="list-style-type: none"> - DN 50/2 inch PN 16 - DN 65/2½ inch PN 16 - DN 80/3 inch PN 10 		1 E 1 F 1 G 2 E 2 F 2 G 4 M 4 N 4 P			
Other version Add Order codes and plain text: Process connection: ..., Nominal diameter: ...; Nominal pressure: ...		9 A		H 1 Y	
Filling liquid					
<ul style="list-style-type: none"> Food oil (FDA listed) 		7			
Other version Add Order code and plain text: Filling liquid: ...		9		M 1 Y	
Connection to transmitter					
through capillary, Length: ¹⁾					
<ul style="list-style-type: none"> 1.0 m (3.28 ft) 1.6 m (5.25 ft) 2.5 m (8.20 ft) 4.0 m (13.1 ft) 6.0 m (19.7 ft) 8.0 m (26.25 ft) 10.0 m (32.8 ft) 		2 3 4 5 6 7 8			
Special lengths for capillaries					
<ul style="list-style-type: none"> 2.0 m (6.56 ft) 3.0 m (9.84 ft) 5.0 m (16.40 ft) 7.0 m (23.97 ft) 9.0 m (29.53 ft) 		9 9 9 9 9		N1 C N1 E N1 G N1 J N1 L	

¹⁾ Max. capillary length, see section "Technical description"

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Quick-release diaphragm seals

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Article No. and specify Order code.

PVC protective tube

over the spiral protective tube of the capillaries
(color: black)

1.0 m (3.28 ft)	N60
1.6 m (5.25 ft)	N61
2.0 m (6.56 ft)	N62
2.5 m (8.20 ft)	N63
3.0 m (9.84 ft)	N64
4.0 m (13.12 ft)	N65
5.0 m (16.40 ft)	N66
6.0 m (19.69 ft)	N67
7.0 m (22.97 ft)	N68
8.0 m (26.25 ft)	N69
9.0 m (29.53 ft)	N70
10.0 m (32.81 ft)	N71

Negative pressure service

for use in low-pressure range for transmitters for

- differential pressure

V03

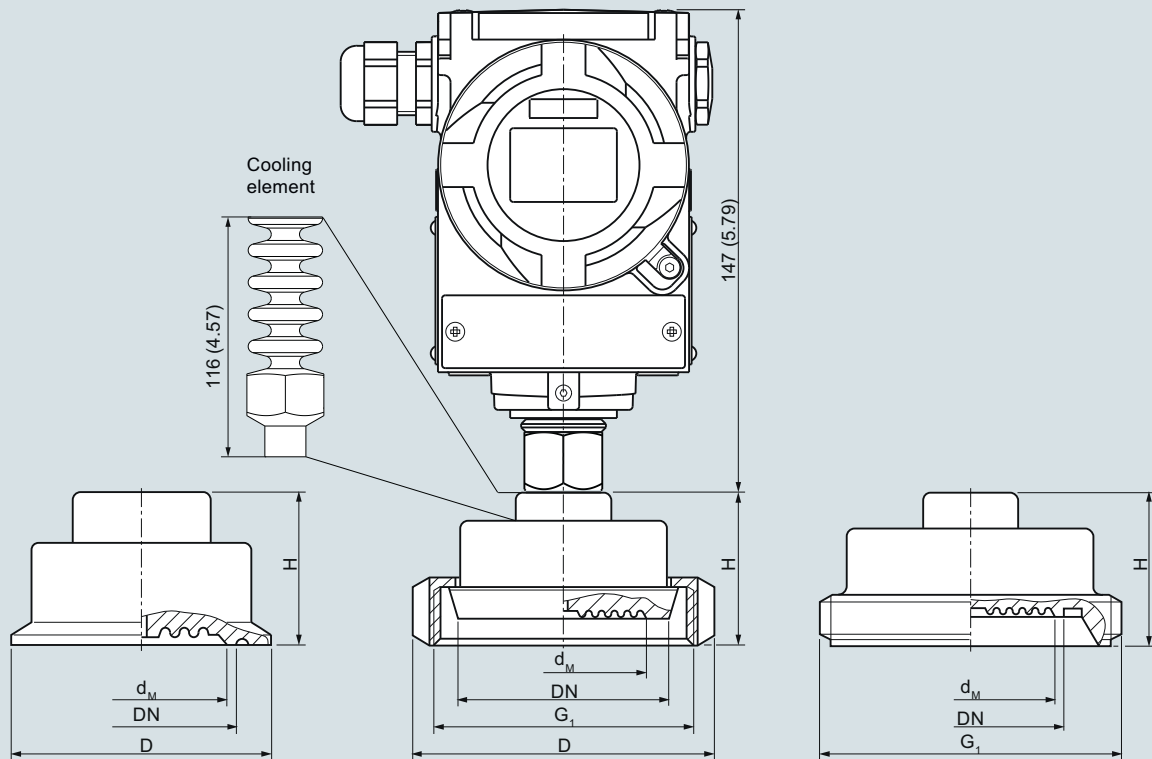
Extended negative pressure service

for use in low-pressure range for transmitters for

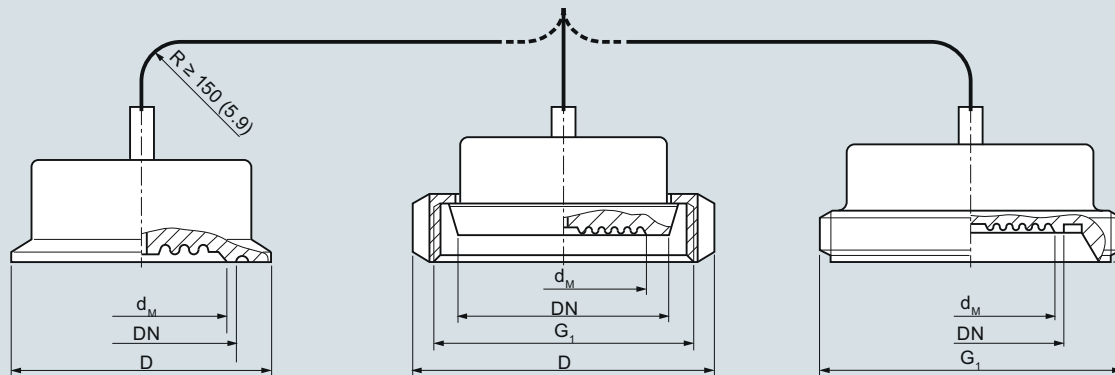
- differential pressure

V53

Dimensional drawings



Mounted directly on SITRANS P transmitter for pressure



Mounted on SITRANS P transmitter for pressure or differential pressure and flow

Quick-release diaphragm seal, dimensions in mm (inch)

Clamp connection (left)

DN	Ø d _M	Ø D	H
40 (1½ inch)	32 (1.26)	50.5 (2)	35 (1.38)
50 (2 inch)	40 (1.57)	64 (2.52)	35 (1.38)
65 (2½ inch)	52 (2.05)	77.5 (3.05)	35 (1.38)
80 (3 inch)	72 (2.83)	91 (3.58)	35 (1.38)

Connection to DIN 11851 with slotted union nut (center)

DN	Ø d _M	Ø D	H	G ₁
25	25	63	36	Rd 52x1/6
32	32	70	36	Rd 52x1/6
40	40	78	36	Rd 65x1/6
50	52	112	36	Rd 78x1/6
65	65	112	36	Rd 95x1/6
80	72	127	36	Rd 110x1/6
25	25	63	36	Rd 52x1/6

Connection to DIN 11851 with threaded socket (right)

DN	Ø d _M	H	G ₁
25	25	36	Rd 52x1/6
32	32	36	Rd 52x1/6
40	40	36	Rd 65x1/6
50	52	36	Rd 78x1/6
65	65	36	Rd 95x1/6
80	72	36	Rd 110x1/6

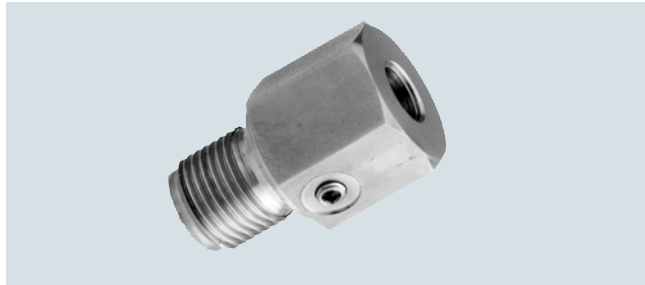
d_M Effective diaphragm diameter

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Miniature diaphragm seals

Overview



Miniature diaphragm seals

The miniature diaphragm seals are available for the following SITRANS P pressure transmitter series for pressure:

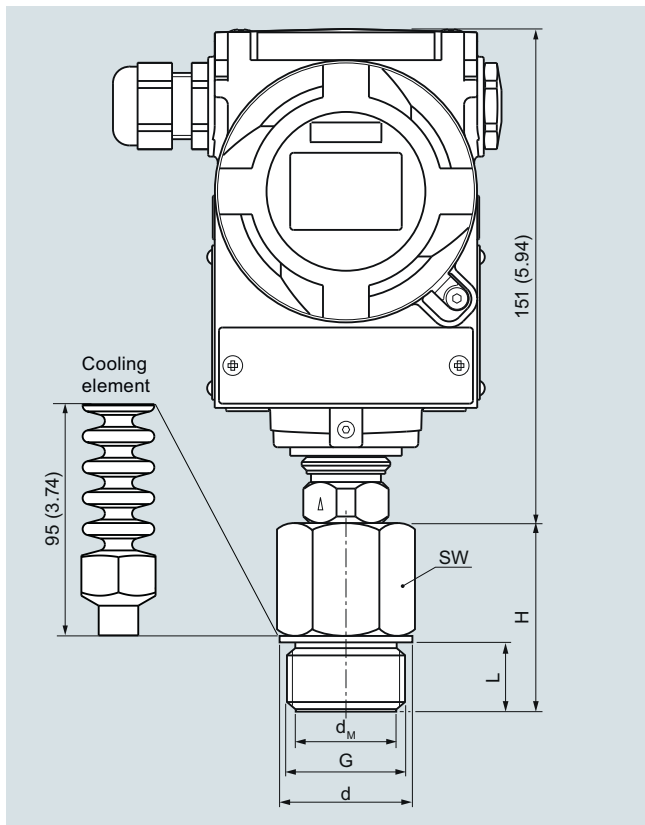
- P300, DS III with HART, DS III with PROFIBUS PA and DS III with FOUNDATION Fieldbus

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

Span with	
• 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 process temperature	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)

Selection and Ordering data		Article No. Ord. code		Selection and Ordering data		Order code	
Miniature diaphragm seals		7MF4960-		Further designs			
directly fitted to SITRANS P pressure transmitters for pressure; type, 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (vacuum-proof design) and 7MF802-... ¹⁾ ; must be ordered separately Material: Stainless steel, mat. No. 1.4404/316L Nominal pressure, see "Pressure transmitters"		1 0		Please add "-Z" to Article No. and specify Order code.			
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				Remote seal nameplate		B20	
				Attached out of stainless steel, contains MLFB and order number of the remote seal			
				Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2		C11	
				Inspection certificate to EN 10204, section 3.1		C12	
				2.2 Certificate of FDA approval of fill oil Only in conjunction with "Food-grade oil" fill liquid (FDA listed)"		C17	
				Functional safety certificate ("SIL 2") to IEC 61508 (Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)		C20	
				Functional safety certificate ("SIL 2/3") to IEC 61508 (Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)		C23	
				Certification acc. to NACE MR-0175 Includes acceptance test certificate 3.1 according 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 acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)		D08	
				Cooling element max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.		R22	
				Negative pressure service for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series		V01	
				Extended negative pressure service for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series		V51	
Process connection		C D E K L M Z		J 1 Y			
• G1B • G1½B • G2B • 1" - NPT • 1½" - NPT • 2" - NPT Other version, add Order code and plain text: Process connection: ...							
Material							
Remote seal enclosure	Wetted parts materials						
Stainless steel mat. No. 1.4404/316L	Stainless steel mat. No. 1.4404/316L	A					
Hastelloy C276	Hastelloy C276	J					
Stainless steel mat. No. 1.4404/316L	Other version Add Order code and plain text: Wetted parts materials	Z		K 1 Y			
Wetted parts materials							
• Stainless steel 316L Other version, add Order code and plain text: Wetted parts materials: ...		A Z		K 1 Y			
Filling liquid							
• Silicone oil M5 • Food oil (FDA listed) Other version, add Order code and plain text: Filling liquid: ...		1 7 9		M 1 Y			

¹⁾ With 7MF802-... and the measuring cells Q, S, T and U also order the vacuum-tight version.

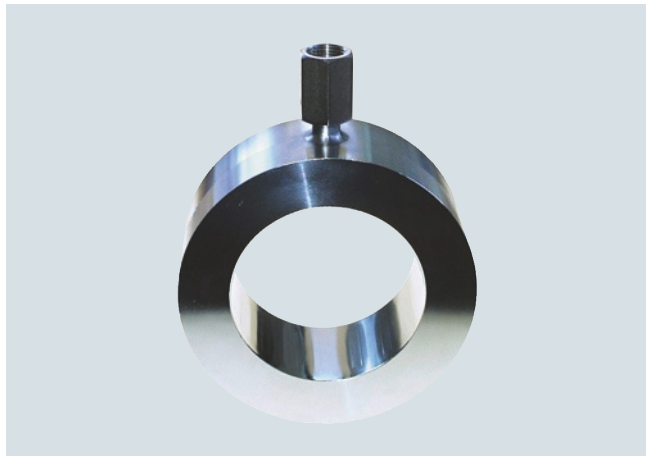
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Inline seals in sandwich design

1

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 remote 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
• DN 25	PN 6 ... PN 100
• DN 40	PN 6 ... PN 100
• DN 50	PN 6 ... PN 100
• DN 80	PN 6 ... PN 100
• DN 100	PN 6 ... PN 100
• 1 inch	Class 150 ... class 2500
• 1½ inch	Class 150 ... class 2500
• 2 inch	Class 150 ... class 2500
• 3 inch	Class 150 ... class 2500
• 4 inch	Class 150 ... class 2500
Process connection	Flange to EN 1092-1 or ASME B 16.5
Sealing surface	<ul style="list-style-type: none"> • 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	Stainless steel 1.4404/316L Stainless steel 1.4404/316L Stainless steel 1.4404/316L <ul style="list-style-type: none"> • 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
• Main body	
• Diaphragm	
• Wetted parts	
• Capillary	Stainless steel, mat. No. 1.4571/316Ti
• Sheath	Spiral protective tube made of stainless steel, mat. No. 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)
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

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Inline seals in sandwich design

1

Selection and Ordering data		Article No.Ord. code	
Inline seal for flange-mounting for SITRANS P pressure transmitters			
for gauge pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... ¹⁾ ; must be ordered separately, scope of delivery: 1 off	7MF4980 -		
for differential pressure and flow 7MF243-...; 7MF4433 or 7MF54-...; order separately, scope of delivery: 1 pair (set); Material: Completely of stainless steel, mat. No. 1.4404/316L; Process connection to EN 1092-1 or ASME B16.5; sealing surface to EN 1092-1, form B1, or to ASME B16.5 RF 125 ... 250 AA	7MF4983 -		
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	10 - B		
Nominal diameter and nominal pressure			
• DN 25 PN 6 ... 100	B		
• DN 40 PN 6 ... 100	D		
• DN 50 PN 6 ... 100	E		
• DN 80 PN 6 ... 100	G		
• DN 100 PN 6 ... 100	H		
• 1 inch Class 150 ... 2500	L		
• 1½ inch Class 150 ... 2500	M		
• 2 inch Class 150 ... 2500	N		
• 3 inch Class 150 ... 2500	P		
• 4 inch Class 150 ... 2500	Q		
Other version	Z	J 1 Y	
Add Order code and plain text: Nominal diameter: ...; Nominal pressure: ...			
Wetted parts materials			
• Stainless steel 316L			
- Without coating	A		
- With PFA coating ²⁾	D		
- With ECTFE coating ^{2) 3)}	F		
• Monel 400, mat. No. 2.4360	G		
• Hastelloy C276, mat. No. 2.4819	J		
• Hastelloy C4, mat. No. 2.4602	U		
• Tantalum	K		
Other version	Z	K 1 Y	
Add Order code and plain text: Wetted parts materials: ...			
Filling liquid			
• Silicone oil M5	1		
• Silicone oil M50	2		
• High-temperature oil	3		
• Halocarbon oil (for measuring O ₂) ⁴⁾	4		
• Food oil (FDA listed)	7		
Other version	9	M 1 Y	
Add Order code and plain text: Filling liquid: ...			

Selection and Ordering data		Article No.Ord. code	
Inline seal for flange-mounting for SITRANS P pressure transmitters			
for gauge pressure 7MF2033-...; 7MF403-... and 7MF423-... together with Order code "V01" (Negative pressure service) and 7MF802-... ¹⁾ ; must be ordered separately, scope of delivery: 1 off	7MF4980 -		
for differential pressure and flow 7MF243-...; 7MF4433 or 7MF54-...; order separately, scope of delivery: 1 pair (set); Material: Completely of stainless steel, mat. No. 1.4404/316L; Process connection to EN 1092-1 or ASME B16.5; sealing surface to EN 1092-1, form B1, or to ASME B16.5 RF 125 ... 250 AA	7MF4983 -		
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	10 - B		
Connection to transmitter			
• direct (only for 7MF4980) through capillary, length: ⁵⁾	0		
• 1.0 m (3.28 ft)	2		
• 1.6 m (5.25 ft)	3		
• 2.5 m (8.20 ft)	4		
• 4.0 m (13.1 ft)	5		
• 6.0 m (19.7 ft)	6		
• 8.0 m (26.25 ft)	7		
• 10.0 m (32.8 ft)	8		
Special lengths for capillaries			
• 2.0 m (6.56 ft)	9	N 1 C	
• 3.0 m (9.84 ft)	9	N 1 E	
• 5.0 m (16.40 ft)	9	N 1 G	
• 7.0 m (23.97 ft)	9	N 1 J	
• 9.0 m (29.53 ft)	9	N 1 L	
<u>only for 7MF4983-...</u>			
• 11.0 m (36.09 ft)	9	N 1 N	
• 12.0 m (39.37 ft)	9	N 1 P	
• 13.0 m (42.65 ft)	9	N 1 Q	
• 14.0 m (45.93 ft)	9	N 1 R	
• 15.0 m (49.21 ft)	9	N 1 S	
1) With 7MF802-... and the measuring cells Q, S, T and U also order the vacuum-tight version. 2) Only for use in non-hazardous atmospheres. 3) For vacuum on request. 4) Oil- and grease- free cleaning to DIN 25410, level 2 and packaging included in the scope of delivery. Refer to "Further designs" C10 and E10. 5) Max. capillary length, see section "Technical description"			

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Inline seals in sandwich design

1

Selection and Ordering data	Order code	Selection and Ordering data	Order code
Further designs		Further designs	
Please add "-Z" to Article No. and specify Order code.		Please add "-Z" to Article No. and specify Order code.	
Spark arrestor With spark arrestor for mounting on zone 0 (including documentation)		PE protective tube over the spiral protective tube of the capillaries (color: white)	
• Pressure and absolute pressure	A01	1.0 m (3.28 ft)	N20
• for differential pressure transmitters	A02	1.6 m (5.25 ft)	N21
Remote seal nameplate	B20	2.0 m (6.56 ft)	N22
Attached out of stainless steel, contains MLFB and order number of the remote seal		2.5 m (8.20 ft)	N23
Oil- and grease-free cleaned version	C10	3.0 m (9.84 ft)	N24
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		4.0 m (13.12 ft)	N25
Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2	C11	5.0 m (16.40 ft)	N26
Inspection certificate	C12	6.0 m (19.69 ft)	N27
to EN 10204, section 3.1		7.0 m (22.97 ft)	N28
2.2 Certificate of FDA approval of fill oil	C17	8.0 m (26.25 ft)	N29
Only in conjunction with "Food-grade oil" fill liquid (FDA listed)		9.0 m (29.53 ft)	N30
Functional safety certificate ("SIL 2") to IEC 61508	C20	10.0 m (32.81 ft)	N31
(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)		only for 7MF4983-...	
Functional safety certificate ("SIL 2/3") to IEC 61508	C23	11.0 m (36.09 ft)	N32
Certification acc. to NACE MR-0175	D07	12.0 m (39.37 ft)	N33
Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)		13.0 m (42.65 ft)	N34
Certification acc. to NACE MR-0103	D08	14.0 m (45.93 ft)	N35
Includes acceptance test certificate 3.1 according to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)		15.0 m (49.21 ft)	N36
Oil- and grease-free cleaned version	E10	PTFE protective tube over the spiral protective tube of the capillaries (color: transparent)	
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		1.0 m (3.28 ft)	N40
One-sided mounting on differential pressure transmitters		1.6 m (5.25 ft)	N41
(only for 7MF4980-...)		2.0 m (6.56 ft)	N42
on high-pressure side	H10	2.5 m (8.20 ft)	N43
on low-pressure side	H11	3.0 m (9.84 ft)	N44
		4.0 m (13.12 ft)	N45
		5.0 m (16.40 ft)	N46
		6.0 m (19.69 ft)	N47
		7.0 m (22.97 ft)	N48
		8.0 m (26.25 ft)	N49
		9.0 m (29.53 ft)	N50
		10.0 m (32.81 ft)	N51
		only for 7MF4983-...	
		11.0 m (36.09 ft)	N52
		12.0 m (39.37 ft)	N53
		13.0 m (42.65 ft)	N54
		14.0 m (45.93 ft)	N55
		15.0 m (49.21 ft)	N56

Pressure Measurement

Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

Inline seals in sandwich design

1

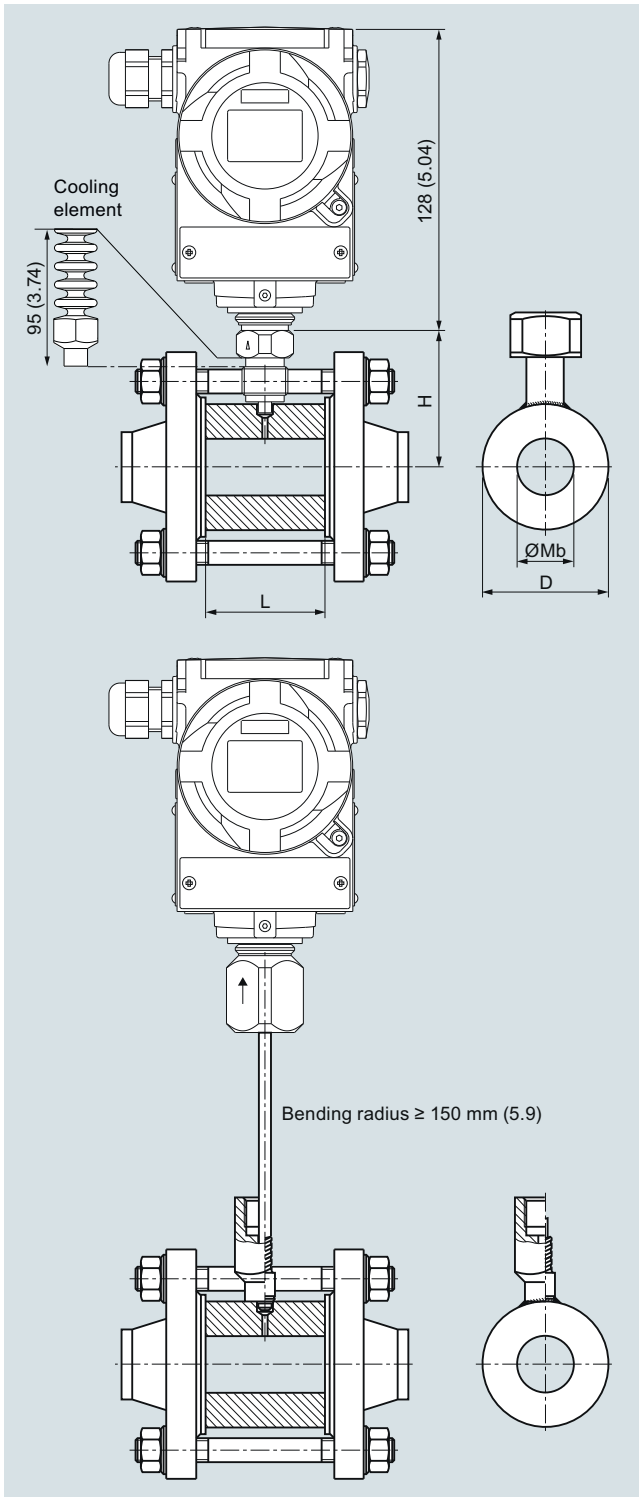
Selection and Ordering data	Order code
Further designs	
Please add "-Z" to Article No. and specify Order code.	
PVC protective tube over the spiral protective tube of the capillaries (color: black)	
1.0 m (3.28 ft)	N60
1.6 m (5.25 ft)	N61
2.0 m (6.56 ft)	N62
2.5 m (8.20 ft)	N63
3.0 m (9.84 ft)	N64
4.0 m (13.12 ft)	N65
5.0 m (16.40 ft)	N66
6.0 m (19.69 ft)	N67
7.0 m (22.97 ft)	N68
8.0 m (26.25 ft)	N69
9.0 m (29.53 ft)	N70
10.0 m (32.81 ft)	N71
<u>only for 7MF4983-...</u>	
11.0 m (36.09 ft)	N72
12.0 m (39.37 ft)	N73
13.0 m (42.65 ft)	N74
14.0 m (45.93 ft)	N75
15.0 m (49.21 ft)	N76
Cooling element max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	R22
Negative pressure service for use in low-pressure range for transmitters for <ul style="list-style-type: none"> gauge and absolute pressure from the pressure series differential pressure Note: Suffix "Y01" required with pressure transmitter	V01 V03
Extended negative pressure service for use in low-pressure range for transmitters for <ul style="list-style-type: none"> gauge and absolute pressure from the pressure series differential pressure Note: Suffix "Y01" required with pressure transmitter	V51 V53

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Inline seals in sandwich design

Dimensional drawings



Inline seal for flange-mounting, connected to SITRANS P pressure transmitter, dimensions in mm (inch)

Connection to EN 1092-1

DN mm	PN bar	D mm	Mb mm	L mm	H mm
25	6 ... 100	63	28.5	60	78.5
40	6 ... 100	85	43	60	89.5
50	6 ... 100	95	54.5	60	92.5
80	6 ... 100	130	82.5	60	112
100	6 ... 100	150	107	60	122

Connection to ASME B16.5

DN (inch)	Class	D mm (inch)	Mb mm (inch)	L mm (inch)	H mm (inch)
1	150 ... 2500	63 (2.48)	28.5 (1.12)	60 (2.36)	78.5 (3.1)
1½	150 ... 2500	85 (3.35)	43 (1.69)	60 (2.36)	89.5 (3.4)
2	150 ... 2500	95 (3.74)	54.5 (2.15)	60 (2.36)	92.5 (3.72)
3	150 ... 2500	130 (5.12)	82.5 (3.25)	60 (2.36)	112 (4.4)
4	150 ... 2500	150 (5.9)	107 (4.21)	60 (2.36)	122 (4.8)

Pressure Measurement

Remote seals for pressure transmitters SITRANS P300, P DS III, P410, P500

Quick-release inline seals

1

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 media and high-viscosity media. Since it is completely integrated in the process pipe, no turbulences, dead volumes or other obstructions to the flow occur. The measured medium flows unhindered through the inline seal and results in self-cleaning of the measuring chamber. Furthermore, the inline seal can be cleaned by a pig.

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

Inline seals of quick-release design for pressure		
Connection	Nominal diameter	Nominal pressure
• To DIN 11851 with threaded socket	DN 25	PN 40
	DN 40	PN 40
	DN 50	PN 25
	DN 65	PN 25
	DN 80	PN 25
	DN 100	PN 25
• Clamp connection	1½ inch	PN 40
	2 inch	PN 40
	2½ inch	PN 40
	3 inch	PN 40
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	

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Quick-release inline seals

Selection and Ordering data

Quick-release inline seal

for SITRANS P pressure transmitters for pressure
7MF2033-...; 7MF403-... and 7MF423-...
together with Order code "V01" (Negative pressure service) and 7MF802-...¹⁾; must be ordered separately
Filling liquid: Food oil (FDA listed)
Material: Stainless steel 316L

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

Nominal diameter Nominal pressure

- Connection to DIN 11851 with screw necks
 - DN 25 PN 40
 - DN 40 PN 40
 - DN 50 PN 25
 - DN 65 PN 25
 - DN 80 PN 25
 - DN 100 PN 25
- Clamp connection
 - 1½ inch PN 16
 - 2 inch PN 16
 - 2½ inch PN 16
 - 3 inch PN 10

Other version

Add Order codes and plain text:

Process connection: ..., Nominal diameter: ...;
Nominal pressure: ...

Filling liquid

- Food oil (FDA listed)

Other version

Add Order code and plain text:

Filling liquid: ...

Connection to transmitter

- Direct

Through capillary, length:²⁾

- 1.0 m (3.28 ft)
- 1.6 m (5.25 ft)
- 2.5 m (8.20 ft)
- 4.0 m (13.1 ft)
- 6.0 m (19.7 ft)
- 8.0 m (26.25 ft)
- 10.0 m (32.8 ft)

Special lengths for capillaries

- 2.0 m (6.56 ft)
- 3.0 m (9.84 ft)
- 5.0 m (16.40 ft)
- 7.0 m (23.97 ft)
- 9.0 m (29.53 ft)

Article No. Ord. code

7 M F 4 9 5 0 -

A 0 - B

2 B

2 D

2 E

2 F

2 G

2 H

4 L

4 M

4 N

4 P

9 Z

H 1 Y

7

9

M 1 Y

0

2

3

4

5

6

7

8

9

N 1 C

9

N 1 E

9

N 1 G

9

N 1 J

9

N 1 L

Selection and Ordering data

Order code

Further designs

Please add "-Z" to Article No. and specify Order code.

Remote seal nameplate

Attached out of stainless steel, contains MLFB and order number of the remote seal

B20

Quality Inspection Certificate (5-point characteristic curve test) according to IEC 60770-2

C11

Inspection certificate

to EN 10204, section 3.1

C12

2.2 Certificate of FDA approval of fill oil

Only in conjunction with "Food-grade oil" fill liquid (FDA listed)

C17

Functional safety certificate ("SIL 2") to IEC 61508

(Only in conjunction with the Order code "C20" in the case of SITRANS P DSIII transmitter)

C20

Functional safety certificate ("SIL 2/3") to IEC 61508

(Only in conjunction with the Order code "C23" in the case of SITRANS P DSIII transmitter)

C23

One-sided mounting on differential pressure transmitters

on high-pressure side

on low-pressure side

H10

H11

PE protective tube

over the spiral protective tube of the capillaries (color: white)

1.0 m (3.28 ft)

N20

1.6 m (5.25 ft)

N21

2.0 m (6.56 ft)

N22

2.5 m (8.20 ft)

N23

3.0 m (9.84 ft)

N24

4.0 m (13.12 ft)

N25

5.0 m (16.40 ft)

N26

6.0 m (19.69 ft)

N27

7.0 m (22.97 ft)

N28

8.0 m (26.25 ft)

N29

9.0 m (29.53 ft)

N30

10.0 m (32.81 ft)

N31

PTFE protective tube

over the spiral protective tube of the capillaries (color: transparent)

1.0 m (3.28 ft)

N40

1.6 m (5.25 ft)

N41

2.0 m (6.56 ft)

N42

2.5 m (8.20 ft)

N43

3.0 m (9.84 ft)

N44

4.0 m (13.12 ft)

N45

5.0 m (16.40 ft)

N46

6.0 m (19.69 ft)

N47

7.0 m (22.97 ft)

N48

8.0 m (26.25 ft)

N49

9.0 m (29.53 ft)

N50

10.0 m (32.81 ft)

N51

¹⁾ With 7MF802-... and the measuring cells Q, S, T and U also order the vacuum-tight version.

²⁾ Max. capillary length, see section "Technical description"

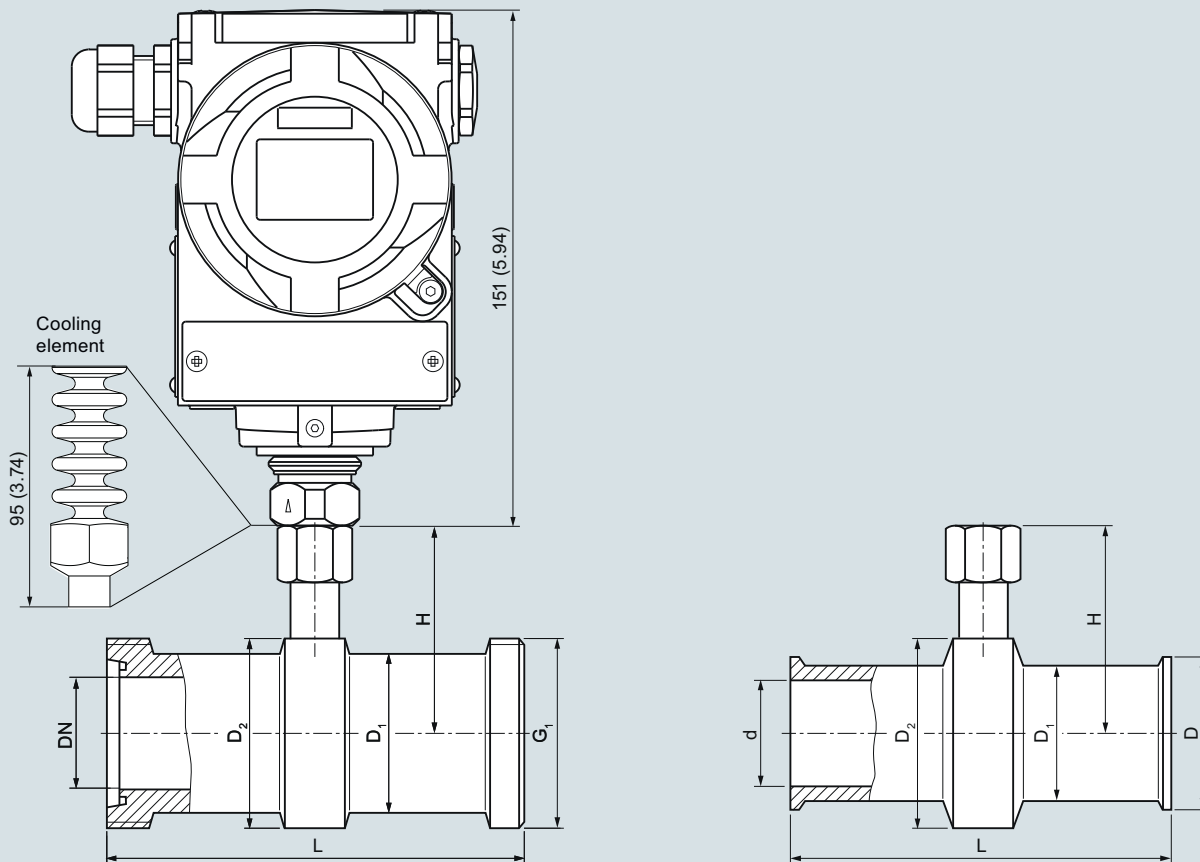
Selection and Ordering data	Order code
Further designs Please add "-Z" to Article No. and specify Order code.	
PVC protective tube over the spiral protective tube of the capillaries (color: black)	
1.0 m (3.28 ft)	N60
1.6 m (5.25 ft)	N61
2.0 m (6.56 ft)	N62
2.5 m (8.20 ft)	N63
3.0 m (9.84 ft)	N64
4.0 m (13.12 ft)	N65
5.0 m (16.40 ft)	N66
6.0 m (19.69 ft)	N67
7.0 m (22.97 ft)	N68
8.0 m (26.25 ft)	N69
9.0 m (29.53 ft)	N70
10.0 m (32.81 ft)	N71
Cooling element max. medium temperature 300 °C, observe the maximum permissible media temperature of the filling liquid.	R22
Negative pressure services for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series	V01
Extended negative pressure service for use in low-pressure range for transmitters for • gauge and absolute pressure from the pressure series	V51

Pressure Measurement

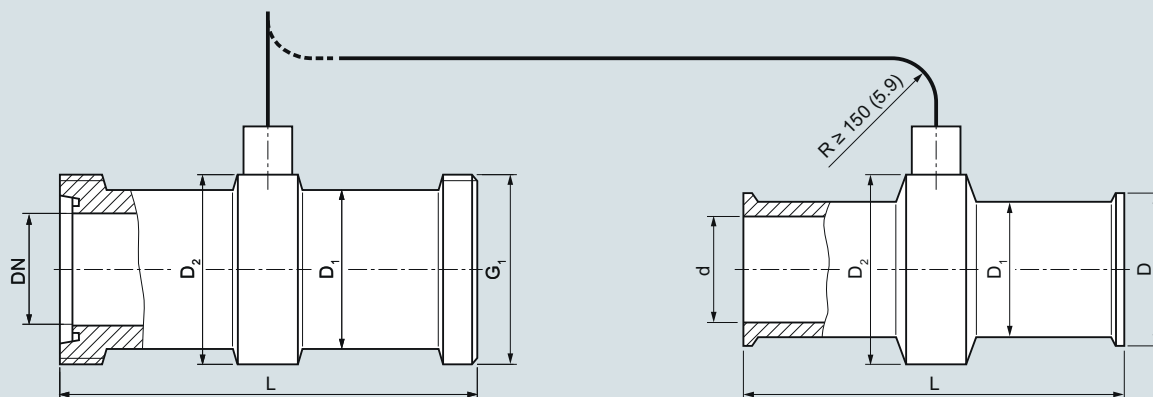
Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Quick-release inline seals

Dimensional drawings



Mounted directly on SITRANS P transmitter for pressure



Mounted on SITRANS P transmitter for pressure or differential pressure and flow

Connection to DIN 11851 with screw necks

DN	Ø D ₁	Ø D ₂	H	L	G ₁
25	38	52	68	128	Rd 52x1/6
40	55	65	74.5	160	Rd 65x1/6
50	68	78	81	170	Rd 78x1/6
65	85	95	89.5	182	Rd 95x1/6
80	110	110	97	182	Rd 110x1/4
100	130	130	107	182	Rd 110x1/4

Clamp connection for pipes to BS 4825/3 and o.D. tubes

d	Ø D ₁	Ø D ₂	H	L	D
mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)
22.2 (1)	38 (1.5)	50 (1.97)	67 (2.64)	114 (4.49)	50.5 (1.98)
34.9 (1½)	43 (1.69)	65 (2.56)	74.5 (2.93)	146 (5.75)	50.5 (1.98)
47.6 (2)	56 (2.2)	75 (2.95)	79.5 (3.13)	156 (6.14)	64 (2.52)
60.3 (2½)	68 (2.68)	77 (3.03)	80.5 (3.17)	156 (6.14)	77.5 (3.05)
73.0 (3)	82 (3.23)	91 (3.58)	87.5 (3.44)	156 (6.14)	91 (3.58)

Quick-release inline seal, dimensions in mm (inch)

Overview



Flushing ring

Flushing rings are required for flange-mounted and sandwich-type remote seals (Article No. 7MF4900 ... 7MF4923) 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

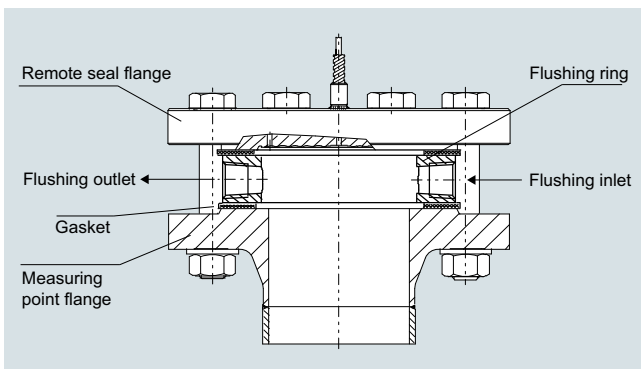
Material: CrNi-Stahl, mat. No. 1.4404/316L
Sealing faces and flushing holes: See Selection and Ordering data

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 RF 125 ... 250 AA RFSF RJF ring groove
• To ASME B16.5	• G $\frac{1}{4}$ • G $\frac{1}{2}$ • $\frac{1}{4}$ -18 NPT • $\frac{1}{2}$ -14 NPT Stainless steel 1.4404/316L
Flushing holes (2 off), female thread	
Material	

Design



Installation example

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Flushing rings for diaphragm seals

1

Selection and Ordering data

Article No.Ord. code

Flushing ring

7MF4925 -

for remote seals 7MF4900 to 7MF4923

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

Nom. diam.

- 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 ... 600
- 3 inch Class 150 ... 600
- 4 inch Class 150 ... 600
- 5 inch Class 150 ... 600

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 ... 600
- 3 inch Class 150 ... 600
- 4 inch Class 150 ... 600
- 5 inch Class 150 ... 600

A
B
C
D
G
H
J
K

Only for RJF ring groove, 7MF4925-1*R....:

- 2 inch Class 150
- 3 inch Class 150
- 4 inch Class 150
- 5 inch Class 150
- 2 inch Class 300 ... 600
- 3 inch Class 300 ... 600
- 4 inch Class 300 ... 600
- 5 inch Class 300 ... 600

NR
PR
QR
RR
UR
VR
WR
XR

Other version

Add Order code and plain text:

Nominal diameter: ...; Nominal pressure: ...

Z

J 1 Y

Sealing surface

- EN 1092-1
 - Form B1
 - Form B2
 - Form C/Form C
 - Form D/Form C
 - Form D/Form D
- Form E
- Form F
- ASME B16.5
 - RF 125 ... 250 AA
 - RFSF
 - RJF ring groove

A
C
D
E
F
G
HM
Q
R
Z

K 1 Y

Other version

Add Order code and plain text:

Sealing surface: ...

Flushing holes (2 off)

- Female thread G $\frac{1}{4}$
- Female thread G $\frac{1}{2}$
- Female thread $\frac{1}{4}$ -18 NPT
- Female thread $\frac{1}{2}$ -14 NPT

1
2
3
4

Material

- Stainless steel 316L

Other version

Add Order code and plain text:

Material: ...

0
9

M 1 Y

Further designs

Please add "-Z" to Article No. and specify Order code.

Order code

Inspection certificate

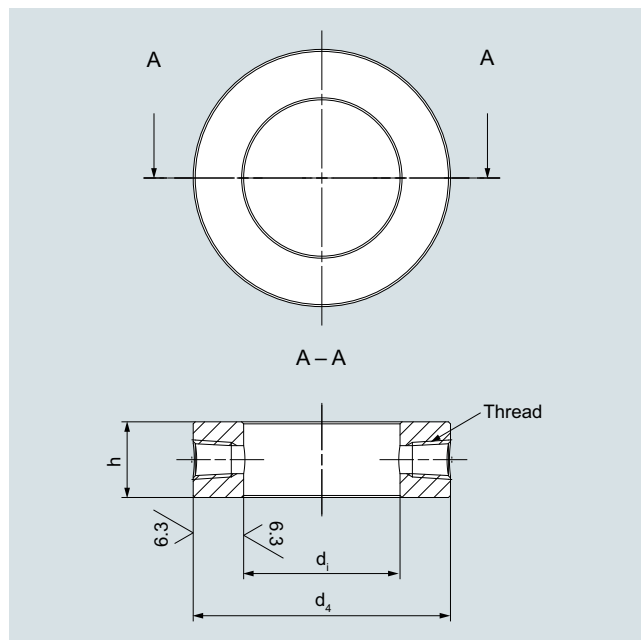
to EN 10204, section 3.1

C12

Dimensional drawings

Connection according to EN 1092-1

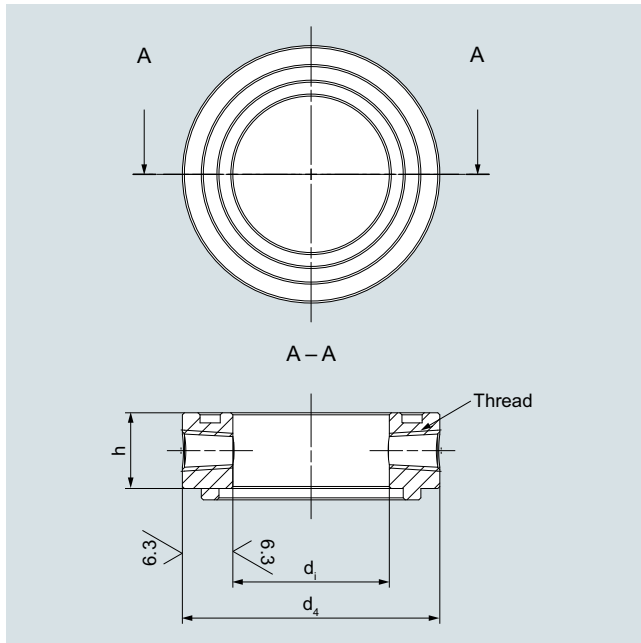
Form B1 and form B2



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)

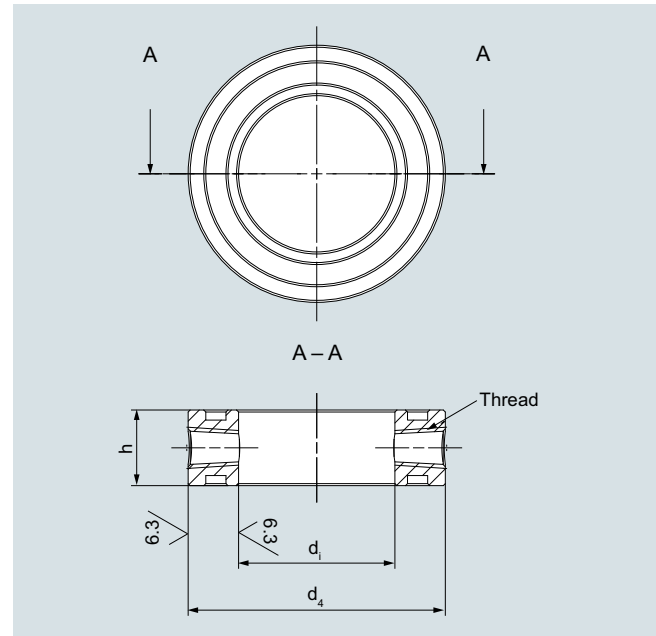
Form D/form C



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

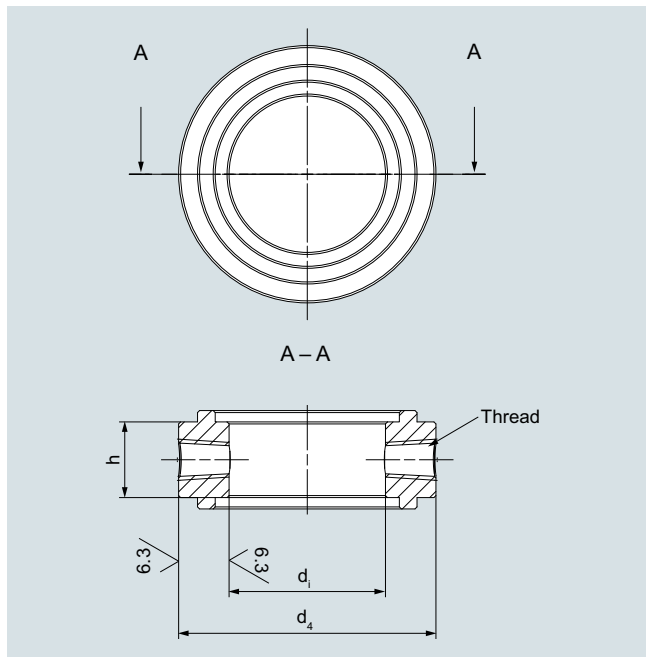
DN	PN	Thread	d ₄	d _i	h	Weight
mm	bar		Ø in mm (inch)	Ø in mm (inch)	Ø in mm (inch)	kg (lb)
50	16 ... 100	¼ NPT	102 (4.02)	62 (2.44)	40 (1.58)	1.65 (3.64)
80	16 ... 100	¼ NPT	138 (5.43)	92 (3.62)	40 (1.58)	2.66 (5.86)
100	16 ... 100	¼ NPT	162 (6.38)	92 (3.62)	40 (1.58)	4.47 (9.86)
125	16 ... 100	¼ NPT	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)

Pressure Measurement

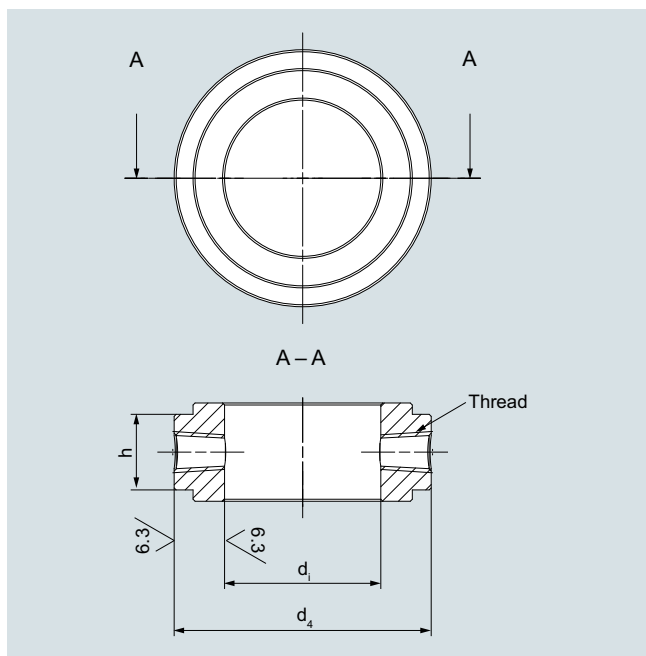
Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Flushing rings for diaphragm seals

Form C/form C and form E



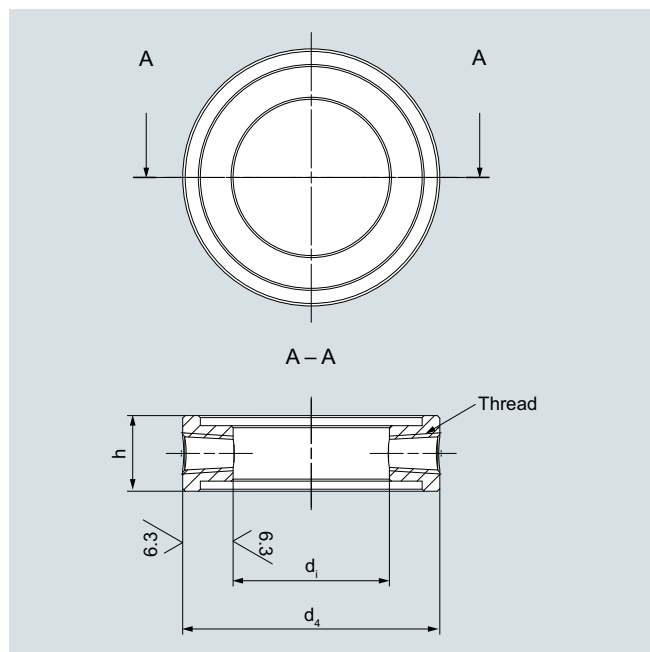
Flushing ring; sealing surface (EN 1092-1), form C/form C



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

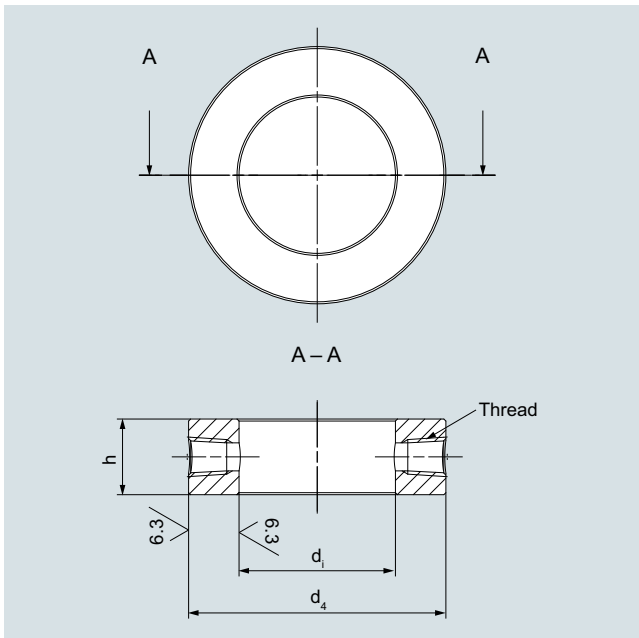


Flushing ring; sealing surface (EN 1092-1), form F

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)

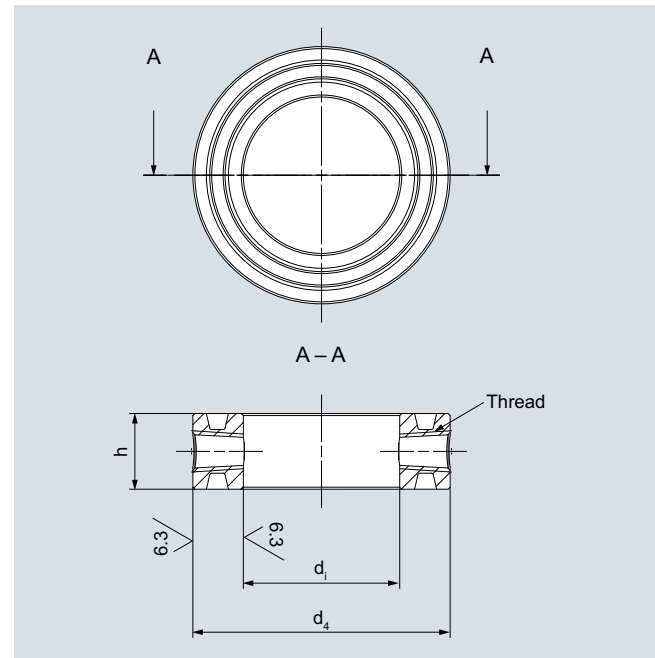
Connection according to ASME B 16.5

RFSF and RF 125 ... 250 AA



Flushing ring; sealing surface (ASME B 16.5), RFSF and RF 125 to 250 AA

DN inch	Class	Thread	d ₄ Ø in mm (inch)	d _i Ø in mm (inch)	h Ø in mm (inch)	Weight 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 inch	Class	Thread	d ₄ Ø in mm (inch)	d _i Ø in mm (inch)	h Ø in mm (inch)	Weight 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)

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Measuring setups

1

Overview

This section shows examples of typical measuring setups for using SITRANS P pressure transmitters with and without remote seals.

Equations for calculating start of scale and full scale 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 start-of-scale and full-scale values 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	7MF2033 7MF4033 7MF4034 7MF4035 7MF8023 7MF8024 7MF8025	7MF4900 7MF4910 7MF4920
C ₁ and C ₂	7MF4233 7MF4234 7MF4235 7MF4333 7MF4334 7MF4335	7MF4900 7MF4910 7MF4920 (negative pressure service in each case) 7MF4901 7MF4921
D	7MF2433 7MF2434 7MF2435 7MF4433 7MF4434 7MF4435 7MF4533 7MF4534 7MF4535 7MF5403 7MF5413	7MF4903 7MF4923
E	7MF2433 7MF2434 7MF2435 7MF4433 7MF4434 7MF4435 7MF4533 7MF4534 7MF4535 7MF5403 7MF5413	7MF4913
G, H and J	7MF2433 7MF2434 7MF2435 7MF4433 7MF4434 7MF4435 7MF4533 7MF4534 7MF4535 7MF5403 7MF5413	7MF4903 7MF4923

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

$H_1 \leq 7 \text{ m (23 ft)}$, with halocarbon oil as filling liquid only $H_1 \leq 4 \text{ m (13.1 ft)}$

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 C₁

Installation type C₂

Pressure transmitter for absolute pressure always below the measuring point: $H_1 \geq 200 \text{ mm (7.9 inch)}$

Installation type C₁ and C₂

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)

Pressure Measurement

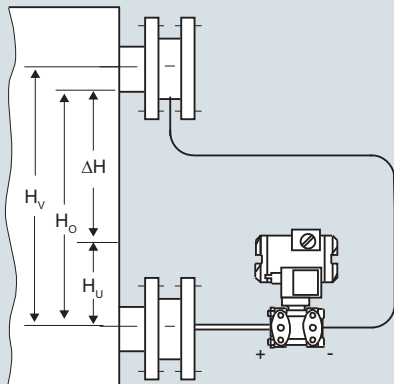
Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

1

Measuring setups with remote seals

Types of installation for level measurements (closed vessels)

Installation type E



Installation type E

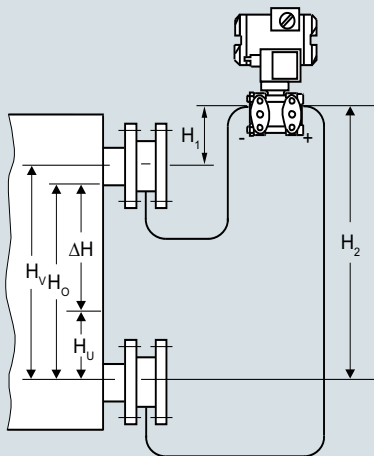
$$\text{Start-of-scale: } p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$$

$$\text{Full-scale: } p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$$

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)

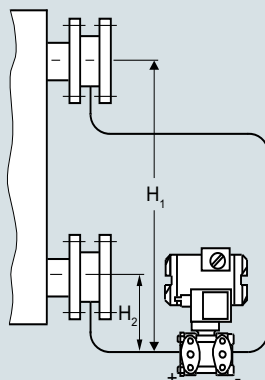
Installation type G



Pressure transmitter for differential pressure
above the upper measuring point, no vacuum

$H_2 \leq 7 \text{ m (23 ft)}$, with halocarbon oil as filling
liquid only $H_1 \leq 4 \text{ m (13.1 ft)}$

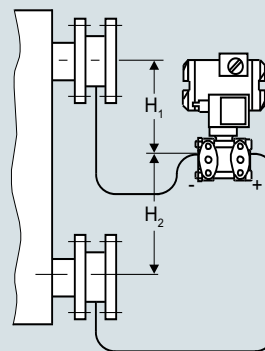
Installation type H



below the lower measuring point

Installation type for vacuum applications

Installation type J



between the measuring points, no vacuum

$H_2 \leq 7 \text{ m (23 ft)}$, with halocarbon oil as filling
liquid only $H_2 \leq 4 \text{ m (13.1 ft)}$

Installation type G, H and J

$$\text{Start-of-scale: } p_{MA} = \rho_{FL} \cdot g \cdot H_U - \rho_{Oil} \cdot g \cdot H_V$$

$$\text{Full-scale: } p_{ME} = \rho_{FL} \cdot g \cdot H_O - \rho_{Oil} \cdot g \cdot H_V$$

Legend

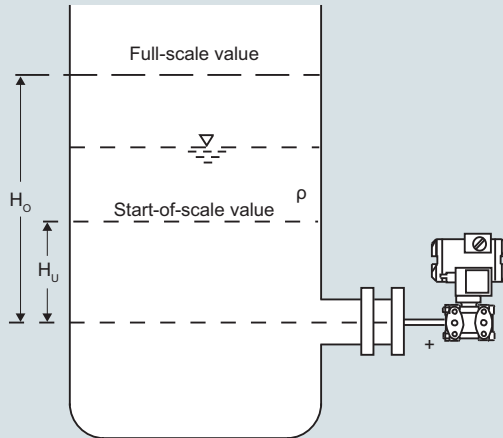
p_{MA}	Start-of-scale value to be set	g	Local acceleration due to gravity
p_{ME}	Full-scale value to be set	H_U	Start-of-scale value
ρ_{FL}	Density of medium in vessel	H_O	Full-scale value
ρ_{Oil}	Density of filling oil in the capillary to the remote seal	H_V	Distance between the measuring points (spigots)

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

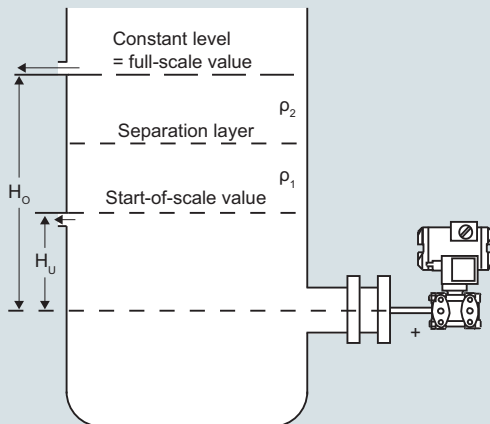
Dimensional drawings**Pressure transmitters for differential pressure, for flanging**Measuring setups for open containers**Level measurement**

$$\text{Start-of-scale: } p_{MA} = \rho \cdot g \cdot H_U$$

$$\text{Full-scale: } p_{ME} = \rho \cdot g \cdot H_O$$

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

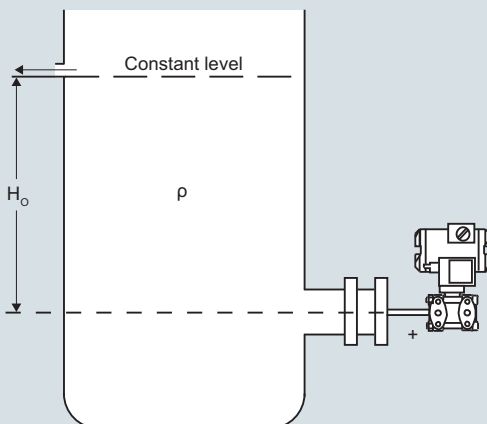
**Separation layer measurement**

$$\text{Start-of-scale: } p_{MA} = g \cdot (H_U \cdot \rho_1 + (H_O - H_U) \cdot \rho_2)$$

$$\text{Full-scale: } p_{ME} = \rho_1 \cdot g \cdot H_O$$

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**

$$\text{Start-of-scale: } p_{MA} = \rho_{MIN} \cdot g \cdot H_O$$

$$\text{Full-scale: } p_{ME} = \rho_{MAX} \cdot g \cdot H_O$$

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

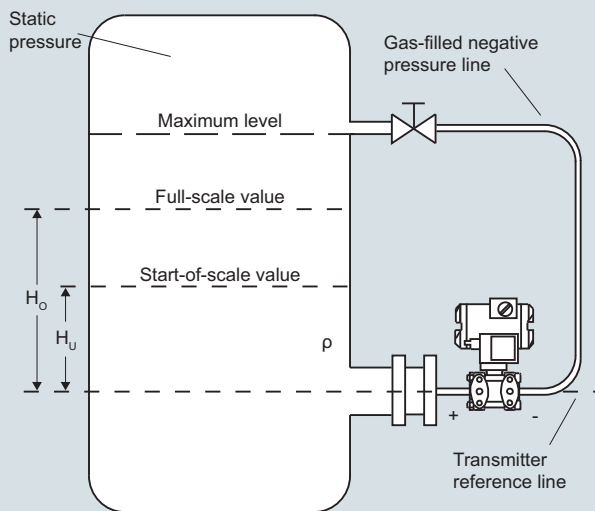
Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

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Measuring setups without remote seals

Measuring setups for closed containers



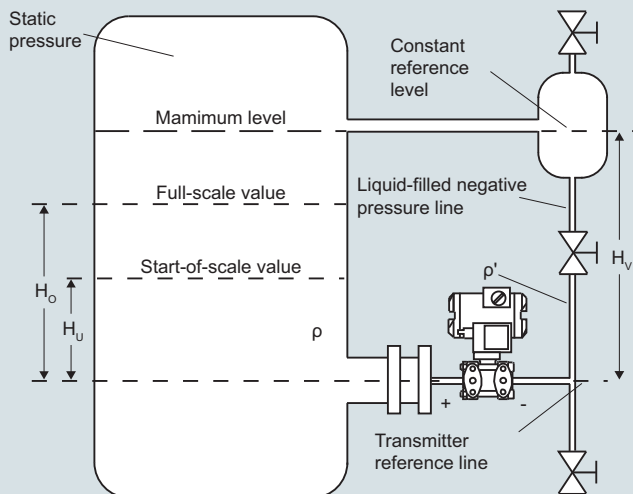
Level measurement, Version 1

Start-of-scale: $\Delta p_{MA} = \rho \cdot g \cdot H_U$

Full-scale: $\Delta p_{ME} = \rho \cdot g \cdot H_O$

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



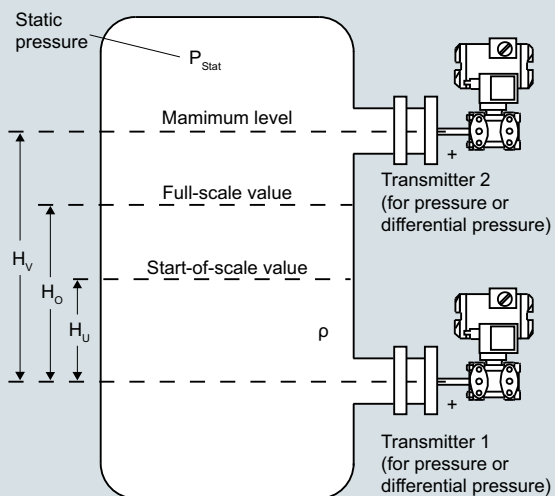
Level measurement, Version 2

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)



Level measurement, Version 3

Start-of-scale: $\Delta p_{MA} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_U}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$

Full-scale: $\Delta p_{ME} = \underbrace{P_{Stat} + \rho \cdot g \cdot H_O}_{\text{Transmitter 1}} - \underbrace{P_{Stat}}_{\text{Transmitter 2}}$

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
H_V	Distance between the measuring points (spigots)

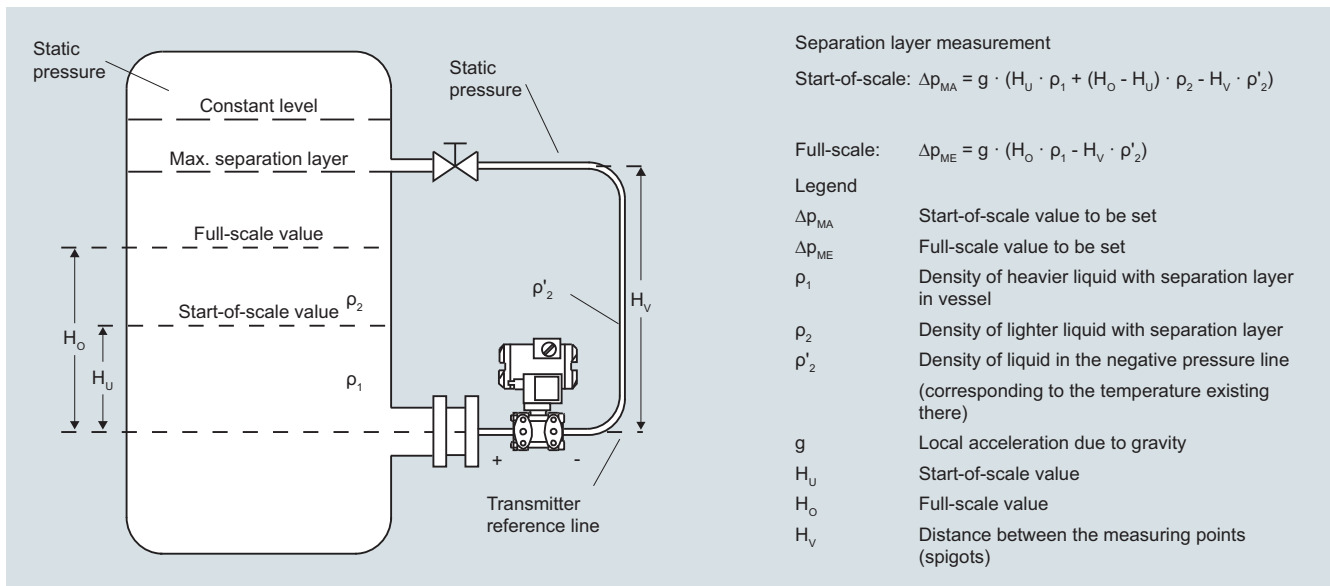
The pressure measuring range (\pm level) will be calculated by subtraction of measuring range of transmitter 1 minus measuring range of transmitter 2 in the process control system.

Pressure Measurement

Remote seals for pressure transmitters
SITRANS P300, P DS III, P410, P500

Measuring setups without remote seals

1



Pressure Measurement

Fittings

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).

New standard 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.

Material acceptance test certificate to EN 10204-3.1

If a material acceptance test certificate to EN 10204-3.1 is required when ordering valve manifolds or shut-off fittings, please note that a single certificate is sufficient for each ordered item type. This means that you will only be charged for one certificate in the cost calculations.

Minimum/maximum operating temperatures

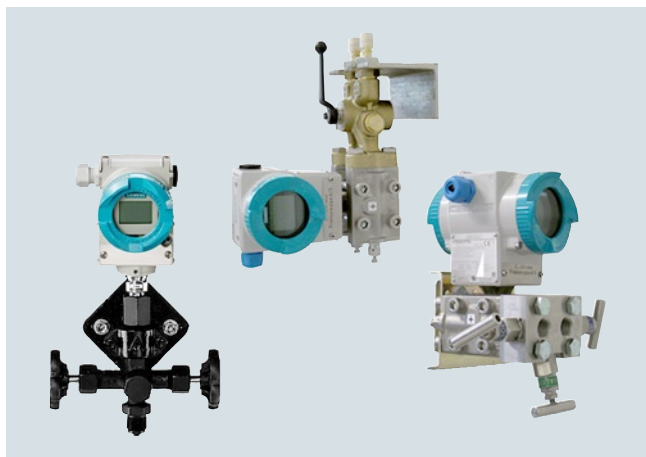
The maximum operating temperatures are given for each value or valve manifold.

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)

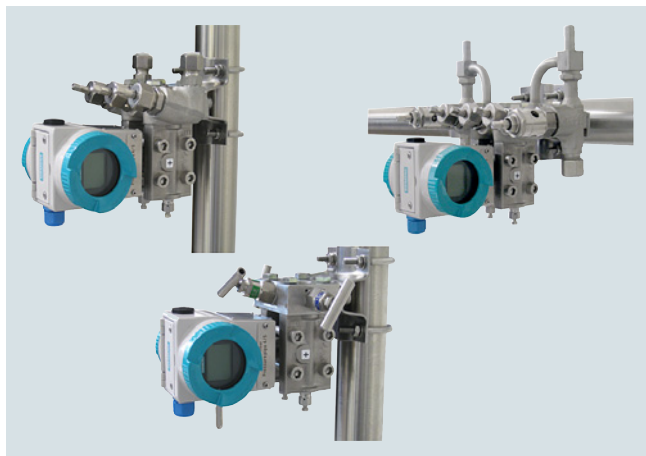
Pressure transmitters with shut-off fittings - mounting examples



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)




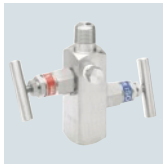
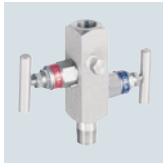

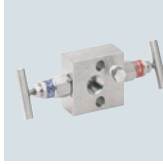
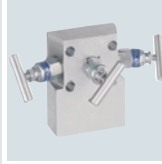


SITRANS P transmitter for differential pressure with 3-way valve manifold, 3-spindle valve manifold or valve manifold combination DN 5/DN 8



SITRANS P pressure transmitter mounted on valve combination "Mono-flange" for direct connection to flanges (available on request)



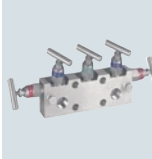






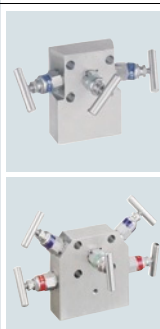
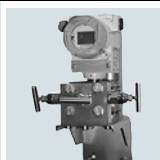
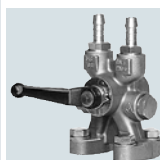
Selection of available shut-off valves

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. <ul style="list-style-type: none">• 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	1/475	 Double shut-off valve DN 5 for crossover ½-NPT-F to G½ nipple connection 7MF9011-4EA 2-spindle valve manifold DN 5 for installation in protective boxes 7MF9412-1B	1/478 1/496	 
Gauge and absolute pressure transmitters with process connection ½"-14 NPT female or male thread e.g. <ul style="list-style-type: none">• 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	1/478	 7MF9011-4FA  7MF9011-4KA	1/478	
Absolute pressure transmitter with process connection to IEC 61518/DIN EN 61518 e.g. <ul style="list-style-type: none">• SITRANS P 320/420 7MF033-...-... 7MF043-...-...• SITRANS P DS III series 7MF433-...	2-spindle valve manifold DN 5 7MF9411-5A.	1/481	 2-spindle valve manifold DN 5 for installation in protective boxes 7MF9412-1C.	1/496	

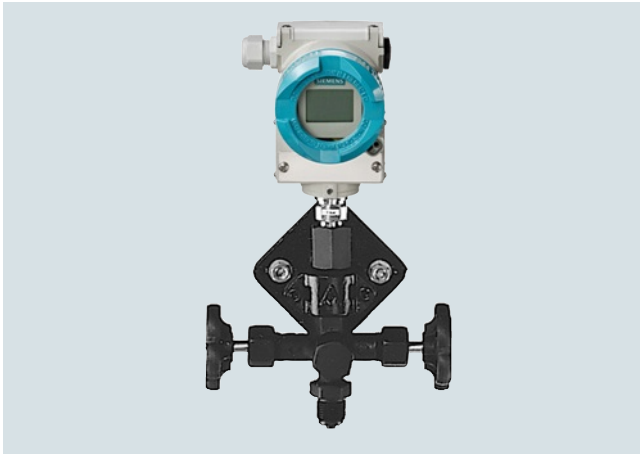
Pressure Measurement

Fittings

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. <ul style="list-style-type: none"> • 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.	1/481	 3-way valve manifold DN 5, forged version 7MF9410-1..	1/486 
			 5-way valve manifold, DN 5, forged version 7MF9410-3..	1/486 
	PN 100 multiway cocks 7MF9004-...	1/484	 3-way valve manifolds DN 8, forged version 7MF9416-1.. and 7MF9416-2..	1/489 
			 valve manifold combination DN 5/DN 8 for vapor measurement 7MF9416-6..	1/492 
			valve manifold combination DN 8 for vapor measurement 7MF9416-4..	1/494 
			3- and 5-spindle valve manifold for DN 5 for installation in protective boxes 7MF9412-1D. and 7MF9412-1E.	1/496 
			3- and 5-spindle valve manifold for vertical differential pressure lines 7MF9413-1..	1/500 
			Low-pressure multiway cock 7MF9004-4..	1/503 

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 housing	Maximum permissible working pressure
---------------------------	---

CW614N (CuZn39Pb3)250 bar (3626 psi) (mat. No. 2.0402)	
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7MF9401-7AA

P250GH (mat. No. 1.0460)	400 bar (5800 psi)
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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 housing	Maximum permissible working pressure
---------------------------	---

CW614N (CuZn39Pb3)250 bar (3626 psi) (mat. No. 2.0402)	
---	--

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 housing	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)
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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 housing	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 housing	Maximum permissible working pressure
---------------------------	---

CW614N (CuZn39Pb3)250 bar (3626 psi) (mat. No. 2.0402)	
---	--

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 housing	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 test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate
EN 10204-3.1

7MF9000-8AD

Instrument bracket, see page 1/480.

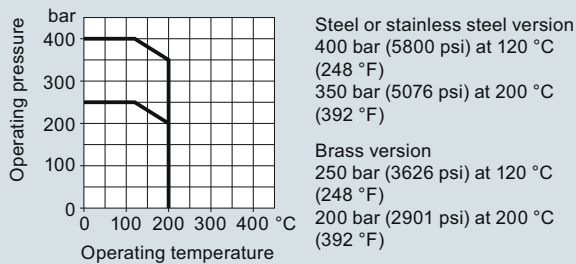
Pressure Measurement

Fittings

Shut-off valves for gauge and absolute pressure transmitters

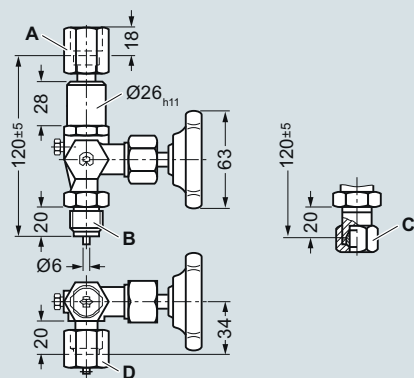
Shut-off valves to DIN 16270, DIN 16271 and DIN 16272

Characteristic curves



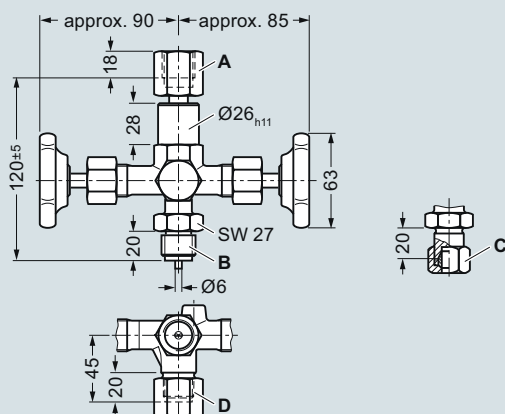
Permissible operating pressure as a function of the permissible operating temperature

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

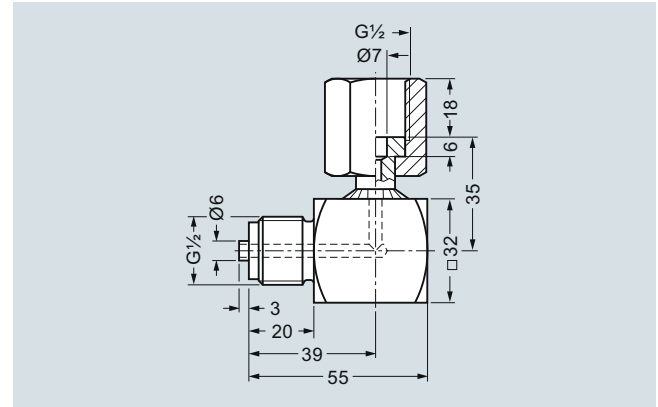
Overview



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.

Dimensional drawings



Angle adapter, dimensions in mm

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

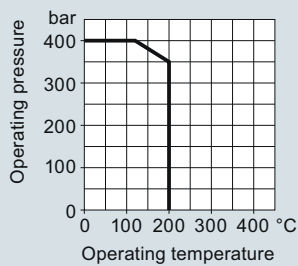
Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test 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

Pressure Measurement

Fittings

Shut-off valves for gauge and absolute pressure transmitters

Shut-off valves/Double shut-off valves

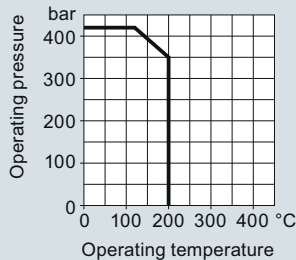
Overview

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

Shut-off valve DN 5

Material: X 6 CrNiMoTi 17 13 2
(W.-Nr. 1.4404/316L), max. permissible
operating overpressure 420 bar (6092 psi)

- Sleeve-sleeve

Article No.

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
- Sleeve-sleeve
- Sleeve-collar
- Collar-collar
- Collar-sleeve

7MF9011-4EA
7MF9011-4HA
7MF9011-4FA
7MF9011-4GA
7MF9011-4KA

Accessories

Factory test certificate EN 10204-2.2

Material acceptance test certificate
EN 10204-3.1

7MF9000-8AB
7MF9000-8AD

Further designs

Add **"-Z"** to Article No. and specify Order code.

Order code

Oil- and grease-free cleaning for oxygen applications, max. pressure PN 100 (1450 psi) and max. temperature 60 °C (140 °F)

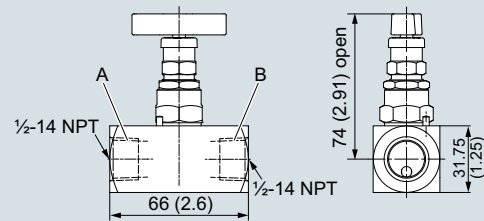
S12

NACE MR-0175-certified

incl. acceptance test certificate 3.1 to EN 10204

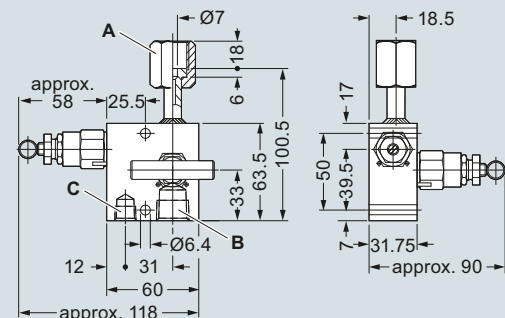
D07

Dimensional drawings



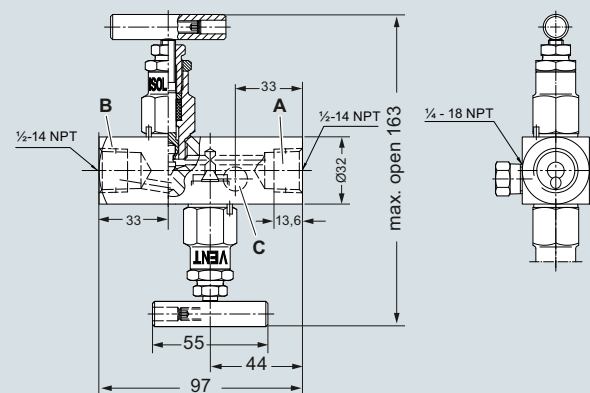
- A Connection on device side: 1/2-14 NPT
- B Connection on measurement side: 1/2-14 NPT

Shut-off valve DN 5 (sleeve-sleeve) 7MF9011-3HA, dimensions in mm (inch)



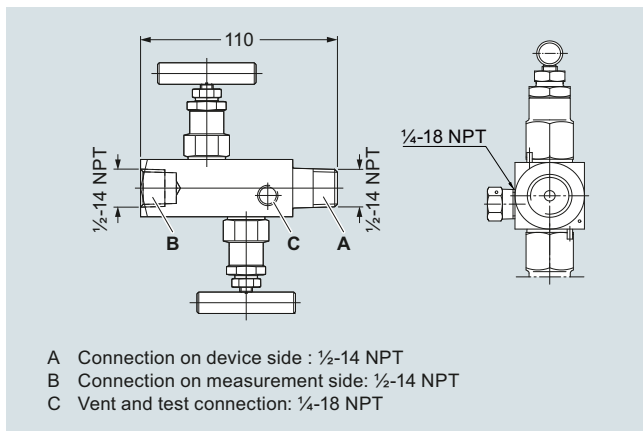
- A Connection on device side: nipple to DIN 16284, G $\frac{1}{2}$, SW 27
B Connection on measurement side: $\frac{1}{2}$ -14 NPT
C Vent and test connection: $\frac{1}{4}$ -18 NPT

Double shut-off valve DN 5 (sleeve-nipple) 7MF9011-4EA,
dimensions in mm

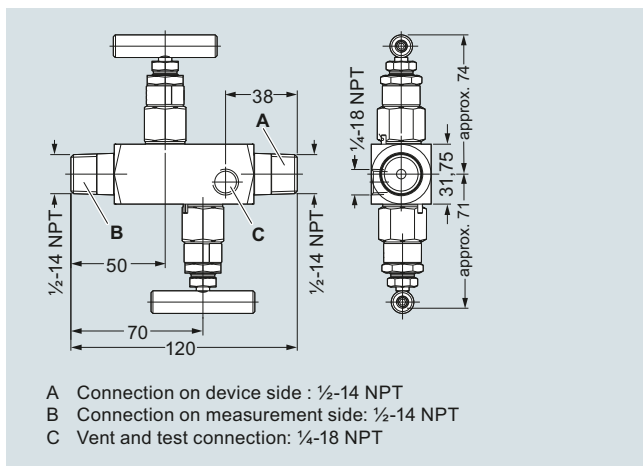


- A Connection on device side : ½-14 NPT
B Connection on measurement side: ½-14 NPT
C Vent and test connection: ¼-18 NPT

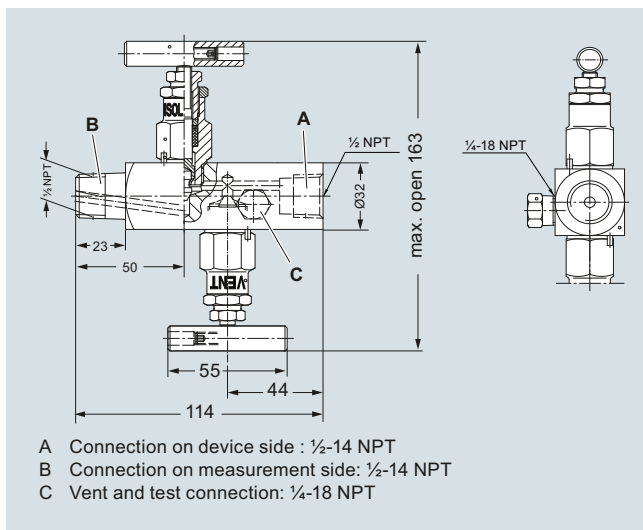
Double shut-off valve DN 5 (sleeve-sleeve) 7MF9011-4HA,
dimensions in mm



Double shut-off valve DN 5 (sleeve-collar) 7MF9011-4FA,
dimensions in mm



Double shut-off valve DN 5 (collar-collar) 7MF9011-4GA,
dimensions in mm



Double shut-off valve DN 5 (collar-sleeve) 7MF9011-4KA,
dimensions in mm

Pressure Measurement

Fittings

Shut-off valves for gauge and absolute pressure transmitters

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

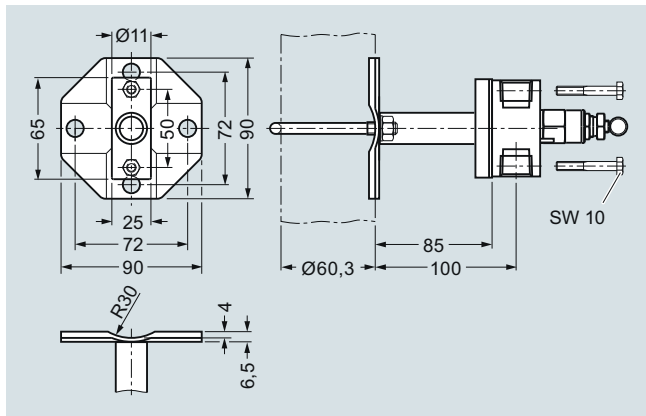
7MF9011-8AB

• 7MF9011-4FA, -4GA, 4HA, -4KA and -3HA

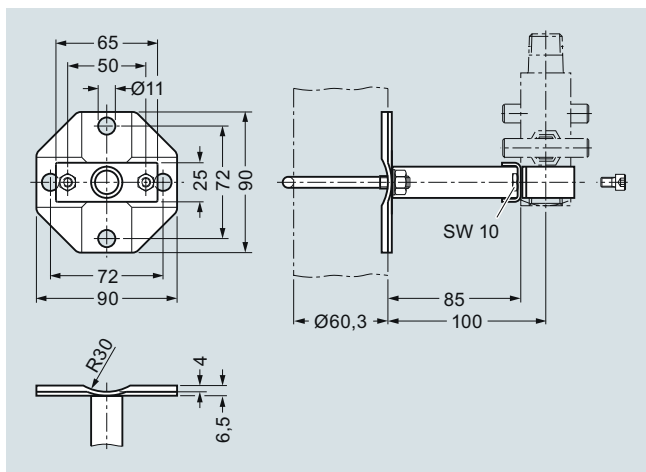
made of stainless steel, scope of delivery:
1x mounting bracket,
2x hexagon screws M6x10,
1x mounting clip,
2x washers 8.4 to DIN 125;
2x hexagon nuts 8.4 to DIN EN 24032

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
- Projection length 100 mm

M56340-A0046
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

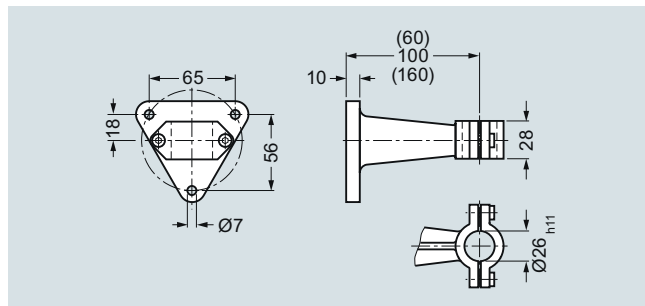
M56340-A0053

Instrument bracket, form A, DIN 16281

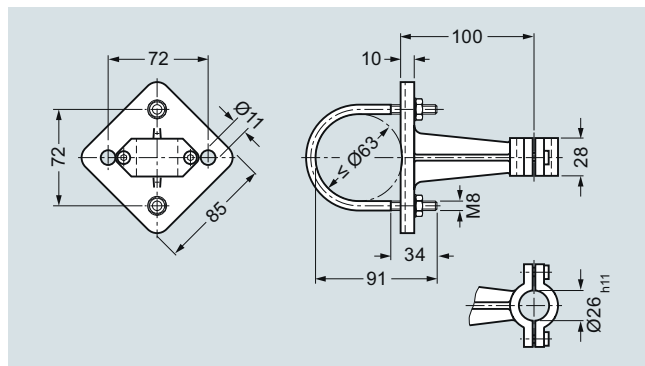
(e.g. for transmitter)
made of annealed cast iron, galvanized and
primed with pipe clamp for **wall and pipe
mounting** (horizontal/vertical)
Screw-type bracket cover

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 1/2-14 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 1/4-18 NPT.

The valves have an external spindle thread.

Materials used

Component	Material	Mat. No.
Housing	X 2 CrNiMo 17 13 2	1.4404/316L
Cones	X 6 CrNiMoTi 17 12 2	1.4571/316Ti
Spindles	X 2 CrNiMo 18 10	1.4404/316L
Head parts	X 5 CrNiMo 18 10	1.4401/316
Packings	PTFE	-

Function

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

Additional functions of the 2-spindle and 5-spindle valve manifolds through the vent and test connection:

- Venting on the transmitter side
- Checking the pressure transmitter characteristic

Selection and Ordering data

Article No.

Valve manifolds DN 5

7MF9411-5A

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
- 3-spindle valve manifold
- 5-spindle valve manifold

5A

5B

5C

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

Selection and Ordering data

Order code

Article No.

Further designs¹⁾

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 1 3/4 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 1 3/4 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 1 3/4 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 1 3/4 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 DIN²⁾

(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

Pressure Measurement

Fittings

Shut-off valves for differential pressure transmitters

1

2-, 3- and 5-spindle valve manifolds DN 5

Selection and Ordering data	Order code	Article No.
Further designs¹⁾		
Please add "-Z" to Article No. and specify Order code. <u>for valve manifolds 7MF9411-5B. and -5C.</u> 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. • for 7MF9411-5B. • for 7MF9411-5C.	S12 S13 S14	
NACE MR-0175-certified incl. acceptance test certificate 3.1 to EN 10204		D07

Accessories

Accessory set for 2-, 3- and 5-spindle valve manifolds

2-spindle valve manifold DN 5

- K35: 2 screws $\frac{7}{16}$ -20 UNF x 1 3/4 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 $\frac{7}{16}$ -20 UNF x 1 3/4 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

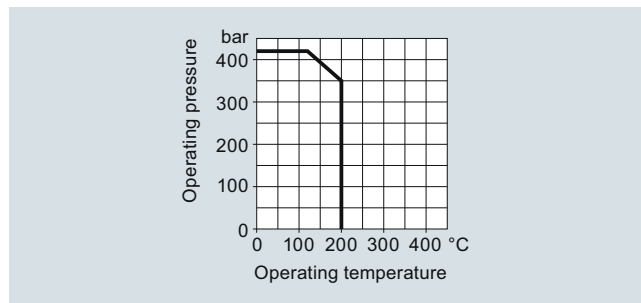
Made of electrogalvanized sheet-steel

- 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

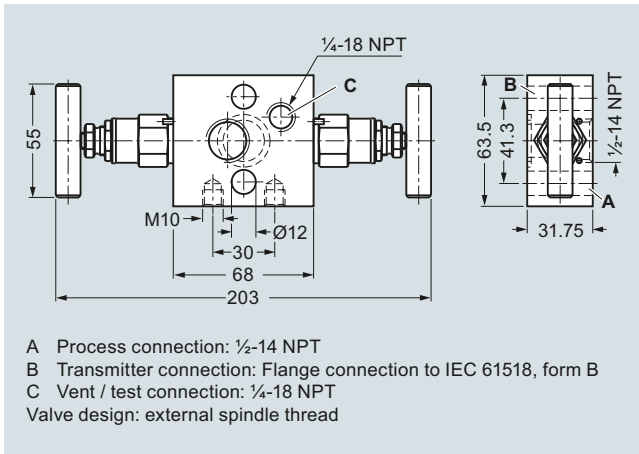


Valve manifolds PN 5 (7MF9411-5..), permissible working pressure as a function of the permissible working temperature

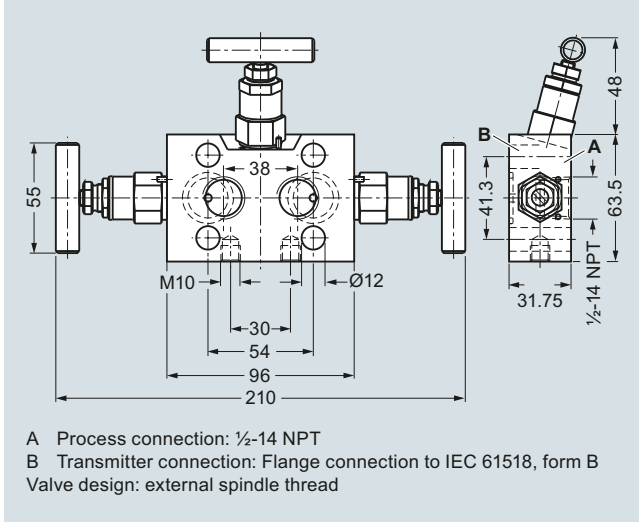
¹⁾ When ordering accessory set or mounting together with the valve manifolds, please use Order code; otherwise use Article No.

²⁾ Flange connections to DIN 19213 only permissible up to PN 160 (2321 psi)!

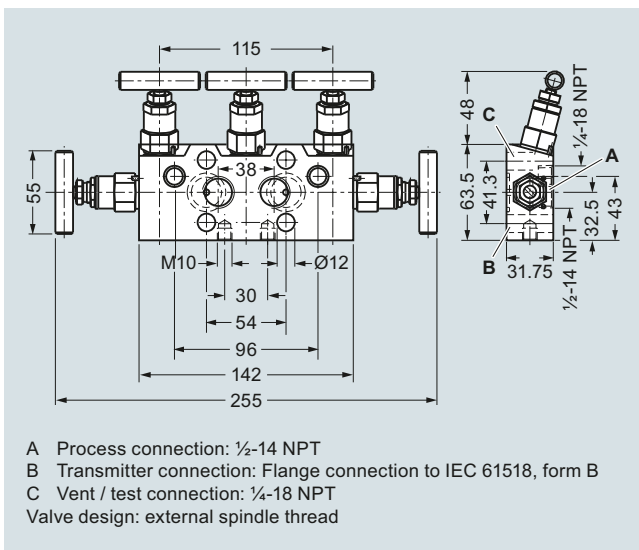
Dimensional drawings



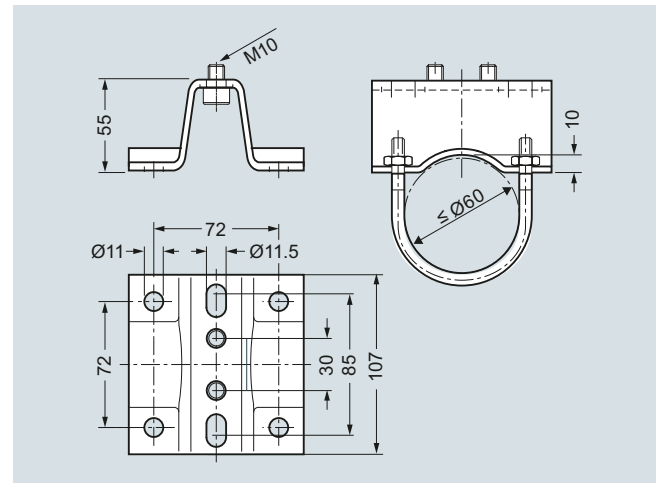
2-spindle valve manifold DN 5 (7MF9411-5A.), dimensions in mm



3-spindle valve manifold DN 5 (7MF9411-5B.), dimensions in mm

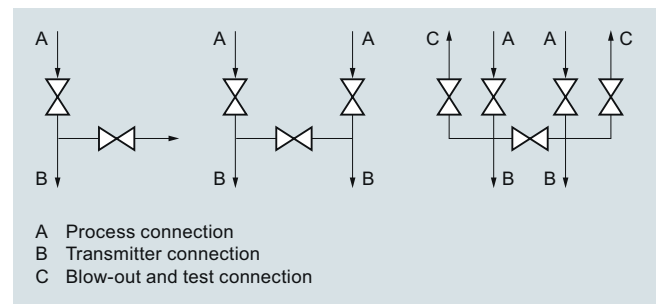


5-spindle valve manifold DN 5 (7MF9411-5C.), dimensions in mm



Mounting plate 7MF9006-6.. (M11, M12) for valve manifold, dimensions in mm

Schematics



2-spindle, 3-spindle and 5-spindle valve manifold DN 5, connections

Pressure Measurement

Fittings

Shut-off valves for differential pressure transmitters

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.

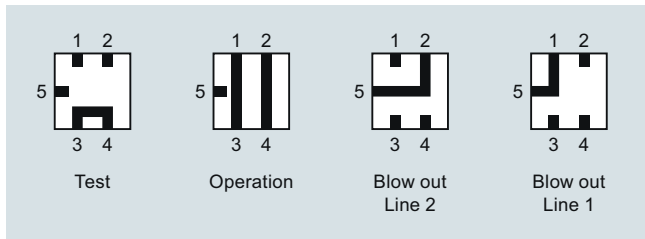
The PN 100 (1450 psi) has 2 process connections and one blow-out connection. A steel version of the multiway cock is available for non-aggressive media, and a stainless steel version for aggressive media. The housing is forged in one piece. The switching lever is removable.

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		
Measured 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	2 bulkhead glands	
• Connection for blowing out	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

Multiway cock PN 100 (1450 psi)	Article No.
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 For aggressive liquids, gases and vapors	7MF9004-1P 1P 1Q
Accessories	
Factory test certificate EN 10204-2.2	7MF9000-8AB
Material acceptance test certificate EN 10204-3.1	7MF9000-8AD

Selection and Ordering data

Further designs ¹⁾	Order code	Article No.
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. acceptance test 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

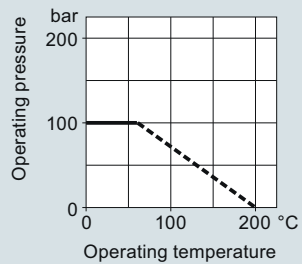
Flat gaskets made of PTFE, max. permissible temperature 80 °C (176 °F)

Multiway cock in oil-free and grease-free design

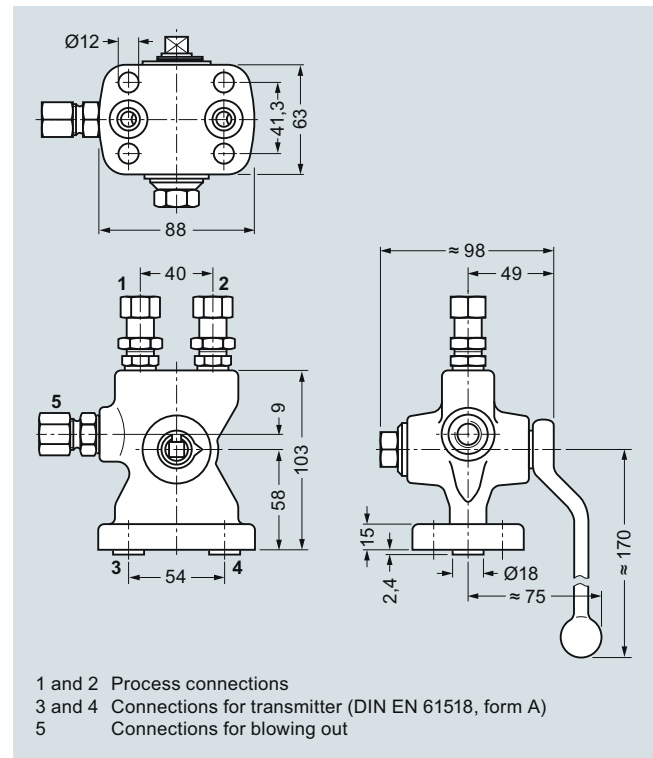
- S11 (only for aggressive liquids, gases and vapors (7MF9004-1Q.)): Max. PN 63 (914 psi) (instead of PN 100 (1450 psi)), BAM-tested lubricant, gasket suitable for oxygen

Mounting brackets

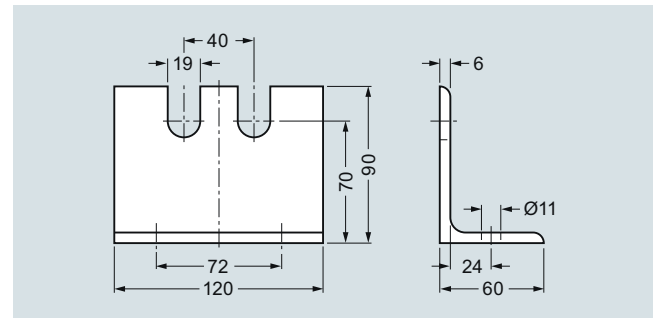
- M13: Required for wall mounting or for securing on rack (72 mm grid); made of electrogalvanized sheet-steel

Characteristic curves

Multiway cock PN 100 (1450 psi), permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings

Multiway cock 7MF9004-1P. for flanging to pressure transmitters for differential pressure, dimensions in mm



Mounting bracket 7MF9004-6AA (M13), dimensions in mm

Pressure Measurement

Fittings

Shut-off valves for differential pressure transmitters

1

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 mounting 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

Component	For non-aggressive liquids and gases		For aggressive liquids and gases	
	Material	Mat. No.	Material	Mat. No.
Housing	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

- 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

7MF9410-1 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
- for aggressive liquids and gases

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
- for aggressive liquids and gases

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

Selection and Ordering data	Order code	Article No.
Further designs¹⁾ Please add "-Z" to Article No. and specify Order code.		
Accessory set to EN (required for flanging, weight 0.2 kg) 4x screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ 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 $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ 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 DIN²⁾ (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 • Version for oxygen	B11 B15 B16	7MF9010-6AD 7MF9010-6AE 7MF9010-6CC
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)		
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 for 7MF9410-3F	S13 S14	
NACE MR-0175-certified incl. acceptance test certificate 3.1 to EN 10204 (only available for version 7MF9410-1FA and -3FA)	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 3-way and 5-way valve manifold DN 5 for flanging

- B31: 4 screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2.1, 2 flat gaskets
- B34: 4 screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ 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

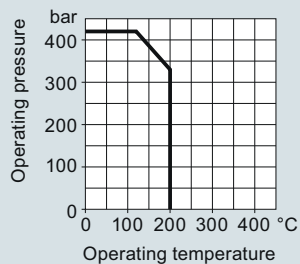
Pressure Measurement

Fittings

Shut-off valves for differential pressure transmitters

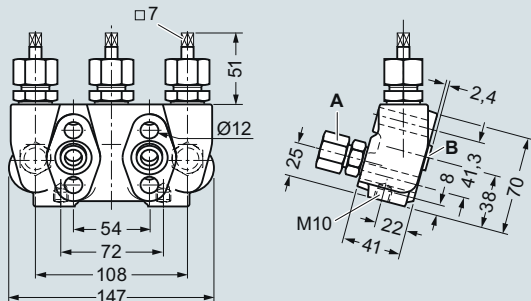
3-way and 5-way valve manifolds DN 5

Characteristic curves



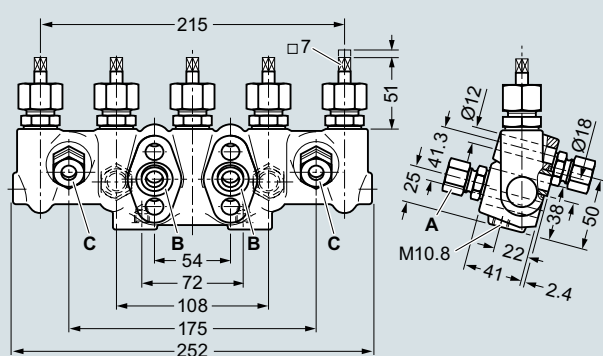
Permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



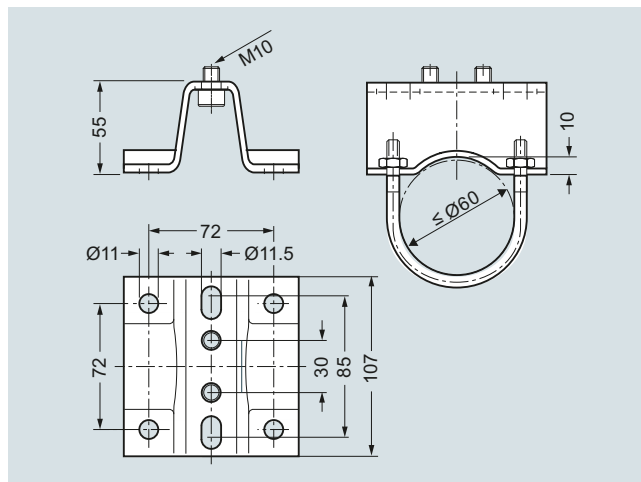
- A Process connection (e.g. on primary device): Pipe union with ferrule, diameter 12 mm, S series to DIN 2353
 B Transmitter connection: Flange connection to EN 61518, form A
 Valve design: internal spindle thread

3-way valve manifold DN 5 (7MF9410-1..), dimensions in mm



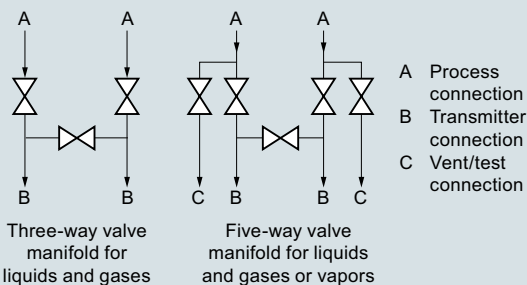
- A Process connection (e.g. on primary device): Pipe union with ferrule, diameter 12 mm, S series to DIN 2353
 B Transmitter connection: Flange connection to IEC 61518, form A
 C Blow-out connection: Pipe union with ferrule, diameter 12 mm, S series to DIN 2353
 Valve design: internal spindle thread

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

Component	For non-aggressive liquids and gases		For aggressive liquids and gases	
	Material	Mat. No.	Material	Mat. No.
Housing	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
process connection: Pipe union with ferrule Ø 12 mm

- without test connection
- with test connection

1 B

1 C

For non-aggressive liquids and gases
process connection: Welding pin Ø 14 x 2.5

- without test connection
- with test connection

2 C

2 D

For aggressive liquids and gases
process connection: Pipe union with ferrule Ø 12 mm

- without test connection
- with test connection

1 D

1 E

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

Pressure Measurement

Fittings

Shut-off valves for differential pressure transmitters

3-way valve manifold DN 8

1

Selection and Ordering data	Order code	Article No.
Further designs¹⁾ Please add "-Z" to Article No. and specify Order code.		
Accessory set to EN (required for flanging, weight 0.2 kg) 4x screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ 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 $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ 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 DIN²⁾ (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. acceptance test 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 $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2.1, 2 flat gaskets
- B34: 4 screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ 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)

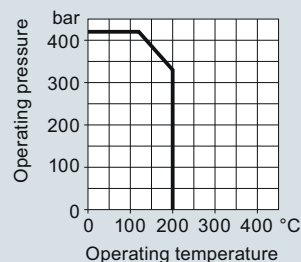
Note: M10 screws only permissible up to PN 160 (2320 psi)!

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

Pressure Measurement

Fittings

Shut-off valves for differential pressure transmitters

1

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 a 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

Component	Valve manifold DN 5		Blow-out valves DN 8	
	Material	Mat. No.	Material	Mat. No.
Housing	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 tem- pered	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
- with test connection M20 × 1.5

C
D

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

Selection and Ordering data

Order code

Article No.

Further designs¹⁾

Please add "-Z" to Article No. and specify Order code.

Accessory set to EN

(required for flanging, weight 0.2 kg)

4x screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ 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 DIN²⁾

(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. permissible 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

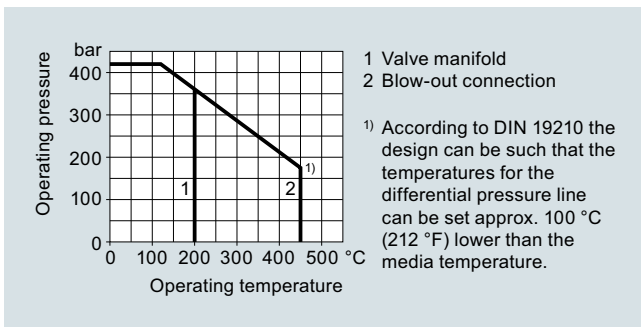
- B34: 4 screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ inch to ASME B18.2.1, 2 O-rings (FPM 90)
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

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)

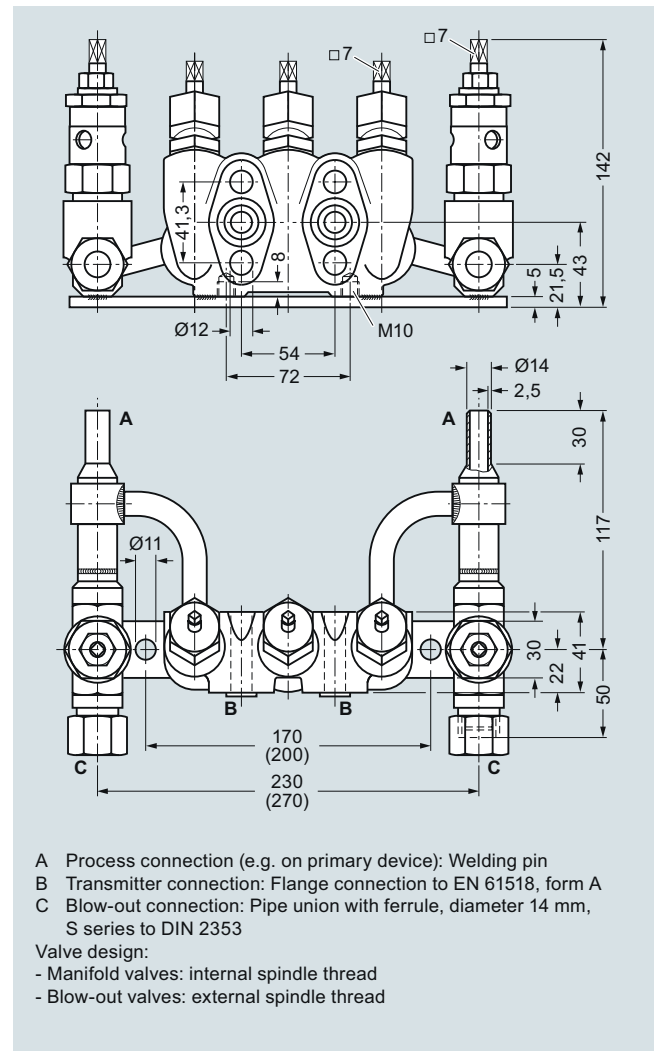
Note: M10 screws only permissible up to PN 160 (2321 psi)!

Characteristic curves



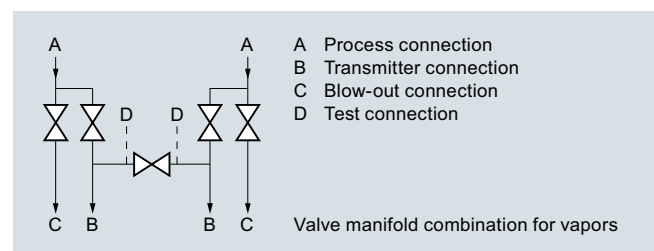
Permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



Valve manifold combination DN 5/DN 8 (7MF9416-6C.), dimensions in mm (deviating dimensions for 7MF9416-6D. shown in brackets)

Schematics



Valve manifold combination DN 5/DN 8, connections

Pressure Measurement

Fittings

Shut-off valves for differential pressure transmitters

Valve manifold combination DN 8

1

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 a 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

Component	Valve manifold		Blow-out valves	
	Material	Mat. No.	Material	Mat. No.
Housing	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 tem- pered	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

Valve manifold combination DN 8 for vapors

➤ 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
- with test connection M20 × 1.5

Accessories

Factory test certificate EN 10204-2.2

Material acceptance test certificate EN 10204-3.1

Article No.

7MF9416 - A

4 C

4 D

Selection and Ordering data

Order code

Article No.

Further designs¹⁾

Please add **"-Z"** to Article No. and specify Order code.

Accessory set to EN

(required for flanging, weight 0.2 kg)

4x screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ 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 DIN²⁾

(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. permissible 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

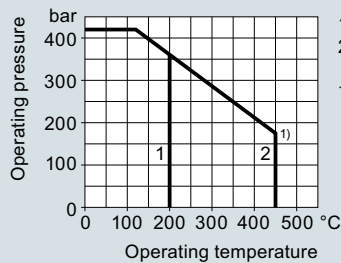
- B34: 4 screws $\frac{7}{16}$ -20 UNF x $2\frac{1}{8}$ inch to ASME B 18.2.1, 2 O-rings (FPM 90)
- B16: 4 screws M10x55 to DIN EN 24014, 4 washers, 2 O-rings (FPM 90)

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

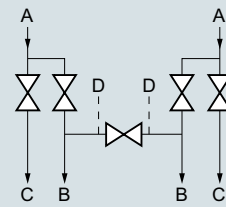


- 1 Valve manifold
2 Blow-out connection

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

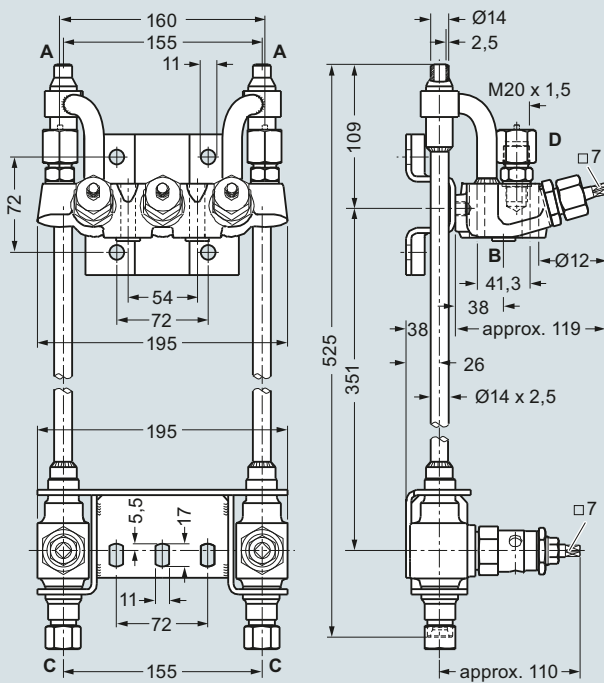


- A Process connection
B Transmitter connection
C Blow-out connection
D Test connection

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 EN 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

Pressure Measurement

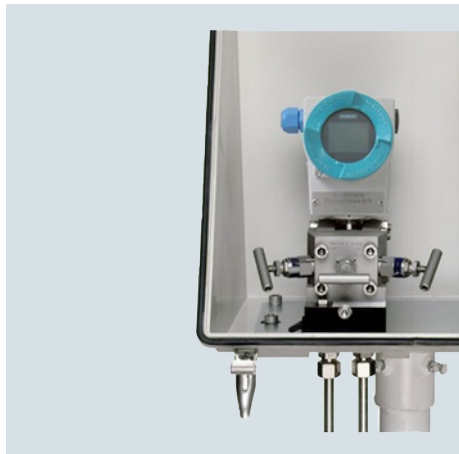
Fittings

Shut-off valves for differential pressure transmitters

1

2-, 3- and 5-spindle valve manifolds for installing in protective boxes

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.

The five-spindle valve manifold permits venting on the transmitter side and checking of the transmitter characteristic.

These valve manifolds are preferentially used when mounting in protective boxes. In addition, they can also be used for wall, frame or pipe mounting together with the mounting bracket.

Transmitters of the DS series can be operated and read from the front when using these valve manifolds.

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 1/2-14 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 1/4-18 NPT.

The valves have an external spindle thread.

Materials used

Components	Material	Mat. No.
Housing	X 2 CrNiMo 17 13 2	1.4404/316L
Cones	X 6 CrNiMoTi 17 12 2	1.4571/316Ti
Spindles	X 2 CrNiMo 18 10	1.4404/316L
Head parts	X 5 CrNiMo 18 10	1.4401/316
Packings	PTFE	-

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 rotating sleeve G1/2 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 test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

Selection and Ordering data

Order code

Article No.

Further designs¹⁾

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. permissible 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. permissible 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 designs¹⁾ Please add "-Z" to Article No. and specify Order code.		
Accessory set to DIN (connection between valve manifold and pressure transmitter) <u>For valve manifold 7MF9412-1C.</u> 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. permissible 420 bar (6092 psi), 120 °C (248 °F) ²⁾ 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⁾ <u>For valve manifold 7MF9412-1D and -1E.</u> 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. permissible 420 bar (6092 psi), 120 °C (248 °F) ²⁾ 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⁾	F12 F15 F14 F16	7MF9412-6AA 7MF9412-6BA 7MF9412-6EA 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. • for valve manifold 7MF9412-1D. • for valve manifold 7MF9412-1E.	M14 M17 M18	7MF9006-6LA 7MF9006-6NA 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. • for valve manifold 7MF9412-1D. • for valve manifold 7MF9412-1E.	S12 S13 S14	
NACE MR-0175-certified incl. acceptance test 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 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 to ASME B 18.2.1, 2 O-rings (FPM90)
- F36: 4 screws 7/16 20 UNF x 2 inch to ASME 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 bolts 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

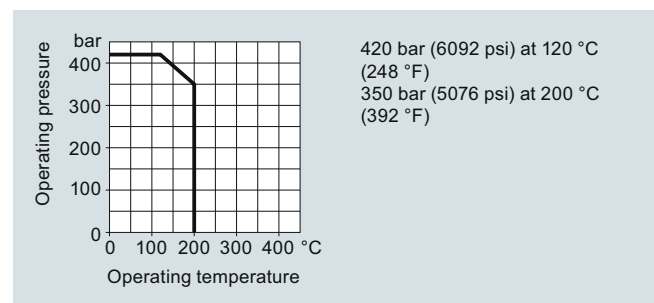
Mounting clips (2 off)

- 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



Permissible operating pressure as a function of the permissible operating temperature

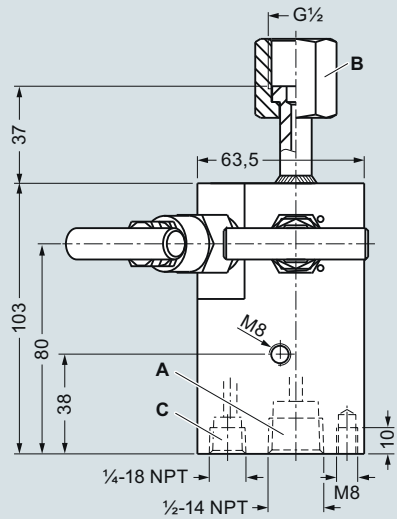
Pressure Measurement

Fittings

Shut-off valves for differential pressure transmitters

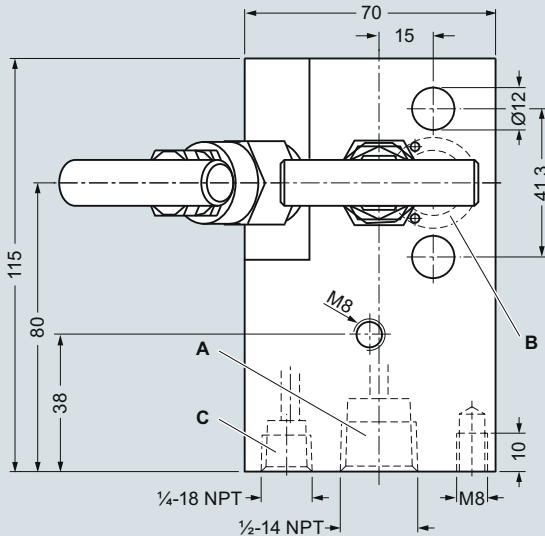
2-, 3- and 5-spindle valve manifolds for installing in protective boxes

Dimensional drawings



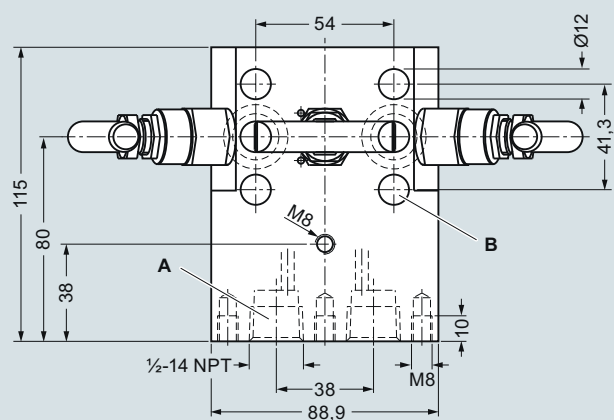
- A Process connection: 1/2-14 NPT
 B Transmitter connection: Nipple to DIN 16284, G1/2, SW 27
 C Vent / test connection: 1/4-18 NPT

2-spindle valve manifold DN 5 (7MF9412-1B..) with rotating sleeve, dimensions in mm



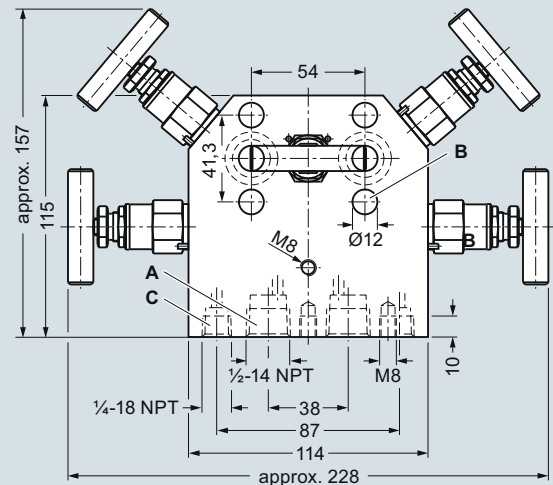
- A Process connection: 1/2-14 NPT
 B Transmitter connection: Flange connection to EN 61518, form A
 C Vent / test connection: 1/4-18 NPT
 Valve design: external spindle thread

2-spindle valve manifold DN 5 (7MF9412-1C..), dimensions in mm



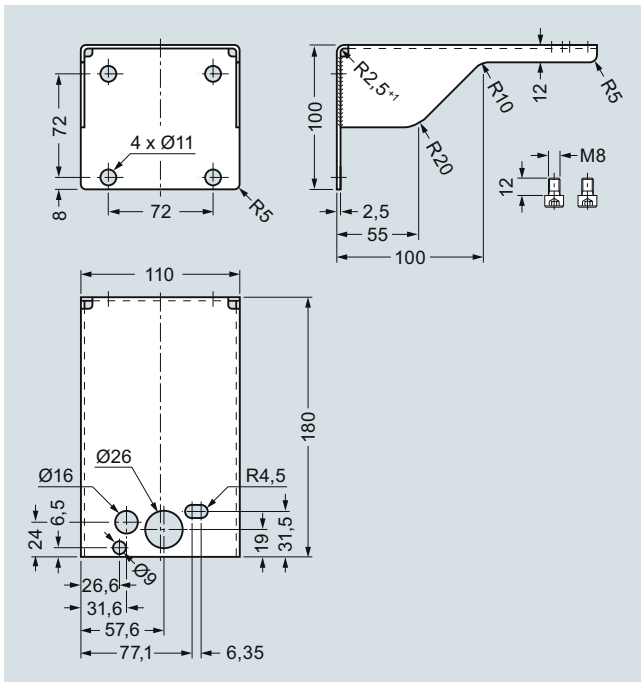
- A Process connection: 1/2-14 NPT
 B Transmitter connection: Flange connection EN 61518, form A
 Valve design: external spindle thread

3-spindle valve manifold DN 5 (7MF9412-1D..), dimensions in mm

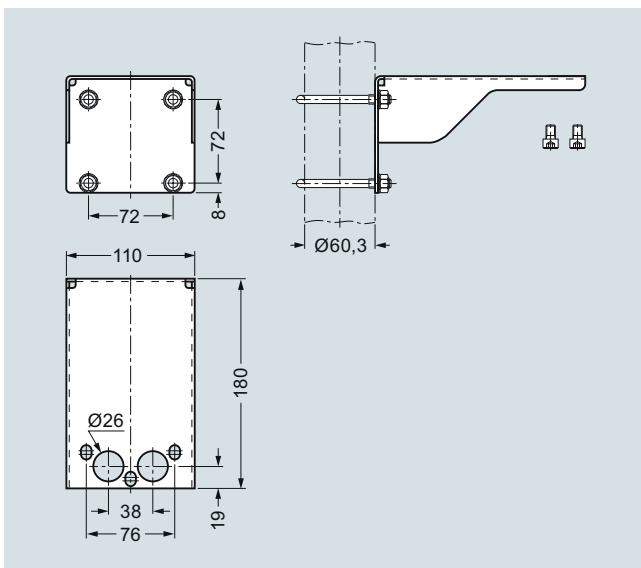


- A Process connection: 1/2-14 NPT
 B Transmitter connection: Flange connection to EN 61518, form A
 C Vent / test connection: 1/4-18 NPT
 Valve design: external spindle thread

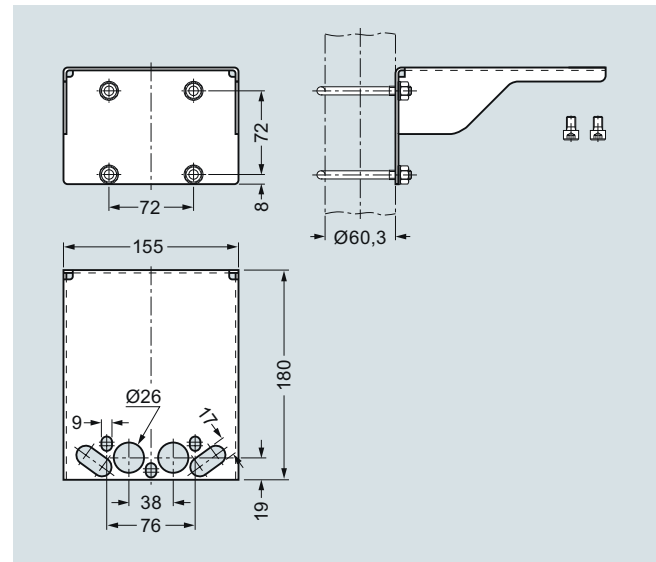
5-spindle valve manifold DN 5 (7MF9412-1E..), dimensions in mm



Mounting bracket (7MF9006-6LA)/(M14) for 2-spindle valve manifold, dimensions in mm

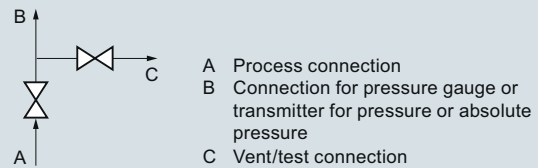


Mounting bracket (7MF9006-6NA)/(M17) for 3-spindle valve manifold, dimensions in mm

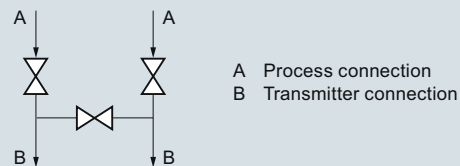


Mounting bracket (7MF9006-6PA)/(M18) for 5-spindle valve manifold, dimensions in mm

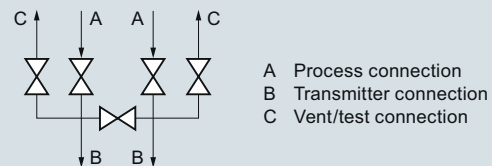
Schematics



2-spindle valve manifold DN 5 (with rotating sleeve G $\frac{1}{2}$ or flange connection), connections



3-spindle valve manifold DN 5, connections



5-spindle valve manifold DN 5, connections

Pressure Measurement

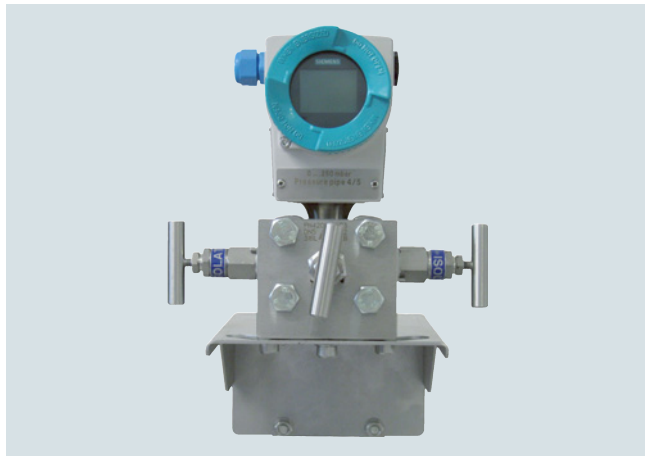
Fittings

Shut-off valves for differential pressure transmitters

1

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 1/2-14 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 1/4-18 NPT.

Materials used:

Component	Material	Mat. No.
Housing	X 2 CrNiMo 17 13 2	1.4404/316L
Cones	X 6 CrNiMoTi 17 12 2	1.4571/316Ti
Spindles	X 2 CrNiMo 18 10	1.4404/316L
Head parts	X 5 CrNiMo 18 10	1.4401/316
Packings	PTFE	-

Function

Functions of all valve manifolds:

- Shutting off the differential pressure lines
- Checking the pressure transmitter zero

Additional functions of the 2-spindle and 5-spindle valve manifolds through the vent and test connection:

- Venting on the transmitter side
- Checking the pressure transmitter characteristic

Selection and Ordering data

Article No.

Valve manifolds for vertical differential pressure lines

7MF9413-1A

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
- 5-spindle valve manifold

1D
1E

Accessories

Factory test certificate EN 10204-2.2

7MF9000-8AB

Material acceptance test certificate EN 10204-3.1

7MF9000-8AD

Selection and Ordering data

Order code

Article No.

Further designs¹⁾

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 1 1/4 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 DIN²⁾

(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.
- for valve manifold 7MF9413-1E.

M17

7MF9006-6NA

M18

7MF9006-6PA

required for mounting on 2" stand-pipe, 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.
- for valve manifold 7MF9413-1E.

S13

S14

NACE MR-0175-certified

incl. acceptance test 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 $\frac{7}{16}$ -20 UNF x 1 $\frac{3}{4}$ 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

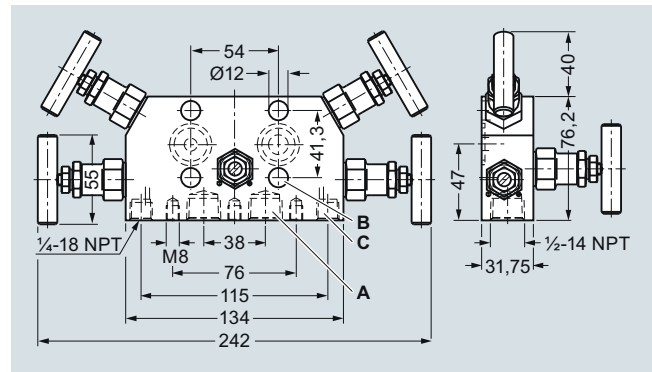
- M19: For 3-spindle valve manifold

Mounting clips (2 off)

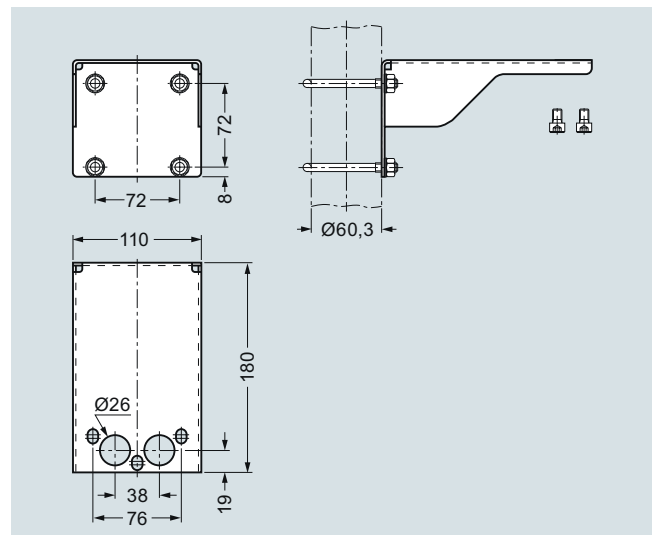
For securing the mounting brackets M17, M18 and M19 to pipe

Valve manifold 100 bar, suitable for oxygen

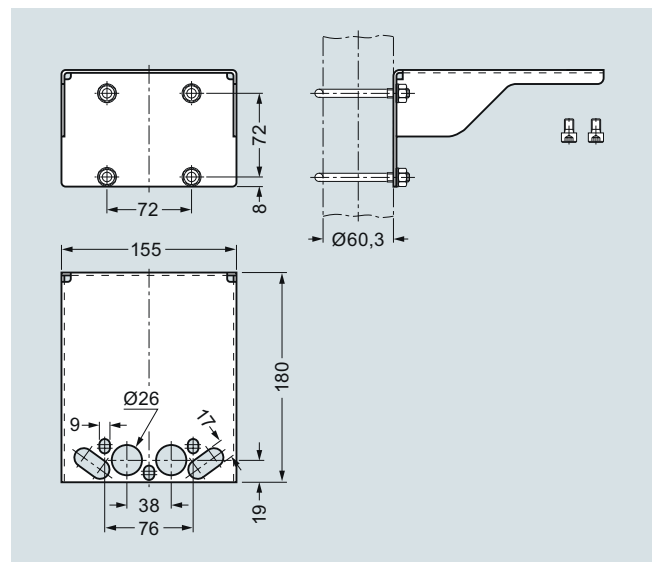
- For 3-spindle valve manifold
- For 5-spindle valve manifold



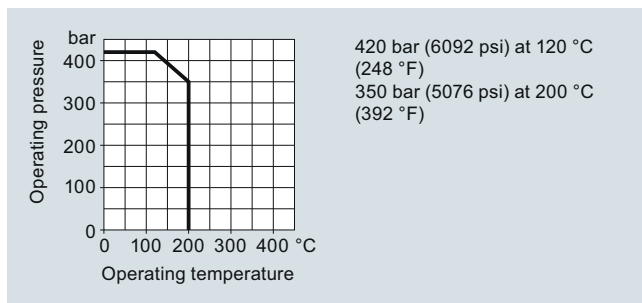
5-spindle valve manifold 7MF9413-1E. for vertical differential pressure lines, dimensions in mm



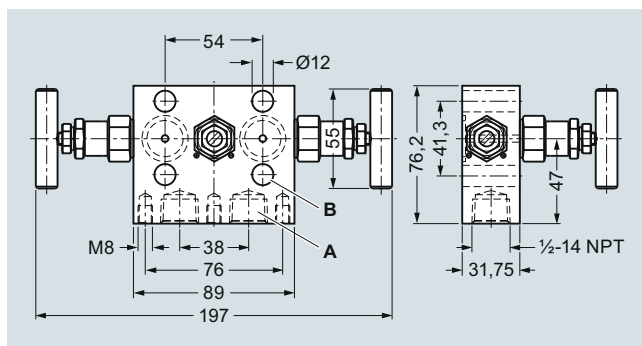
Mounting bracket (7MF9006-6NA)/(M17) for 3-spindle valve manifold, dimensions in mm



Mounting bracket (7MF9006-6PA)/(M18) for 5-spindle valve manifold, dimensions in mm

Characteristic curves

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

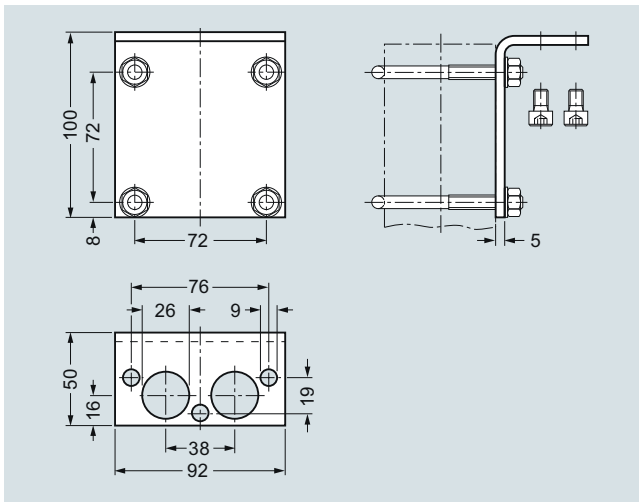
Pressure Measurement

Fittings

Shut-off valves for differential pressure transmitters

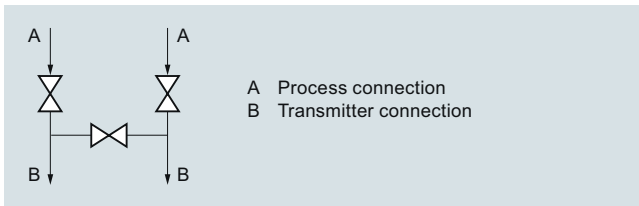
1

3- and 5-spindle valve manifolds for vertical angular differential pressure lines

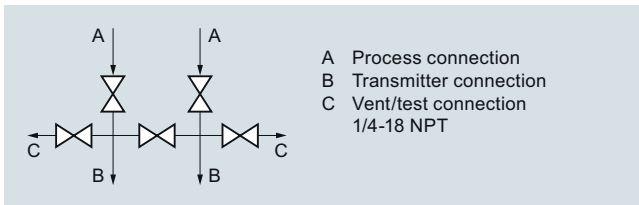


Mounting bracket (7MF9006-6QA)/(M19) for 3-spindle valve manifold, dimensions in mm

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

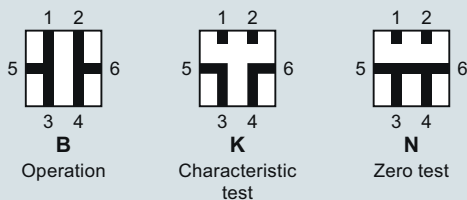
Design

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 housing 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 $G^{3/8}$

2x quick-release couplings

7MF9004-4CA

7MF9004-4DA

Accessories

Test report to EN 10204-3.1

Material acceptance test certificate to EN 10204-3.1

7MF9000-8AB

7MF9000-8AD

Selection and Ordering data

Order code

Article No.

Further designs¹⁾

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.

Pressure Measurement

Fittings

Shut-off valves for differential pressure transmitters

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 \varnothing 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

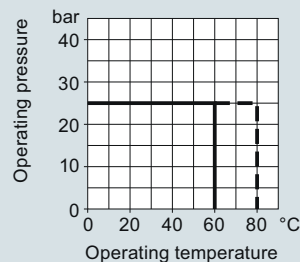
- M13: Required for wall mounting or for securing on rack (72 mm grid); made of electrogalvanized sheet-steel

Options

Test connections

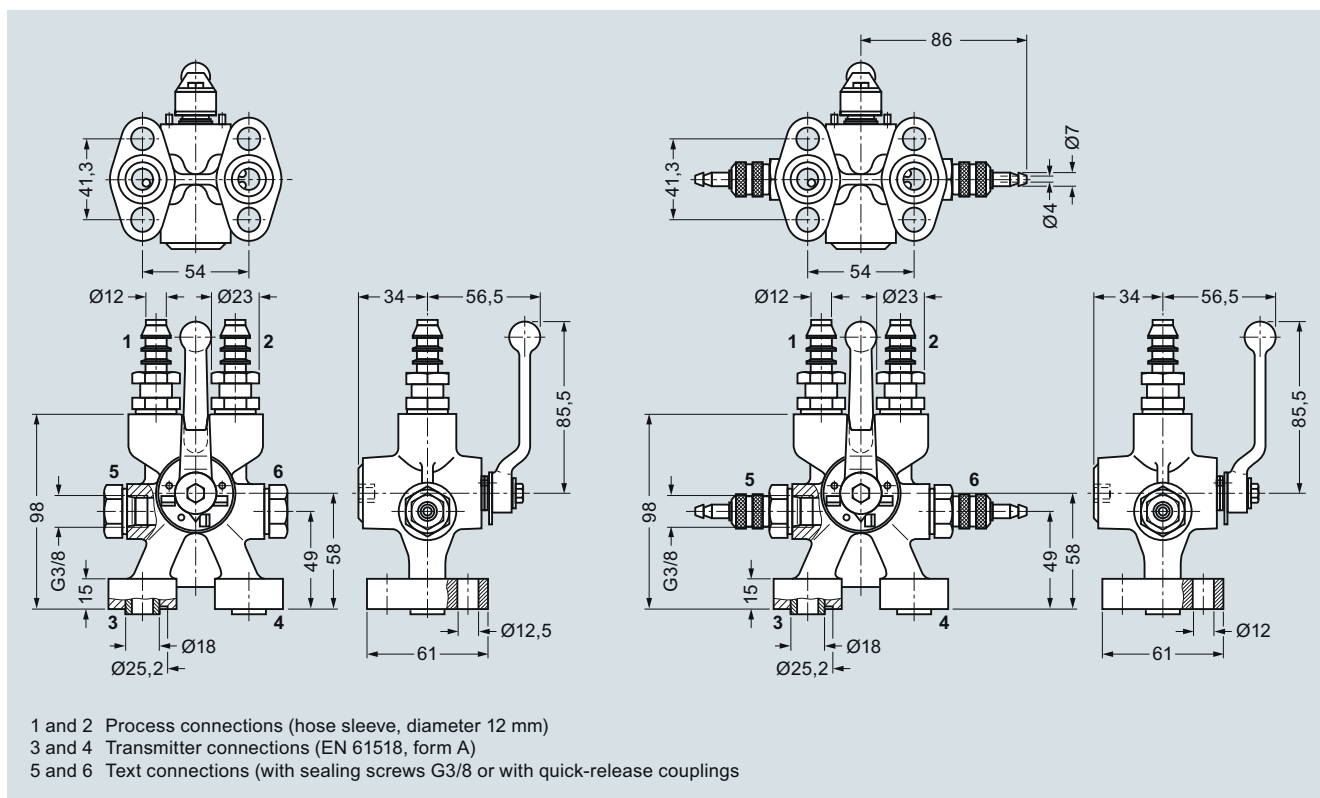
- 2 sealing screws $G^{3/8}$
- 2 quick-release couplings

Characteristic curves

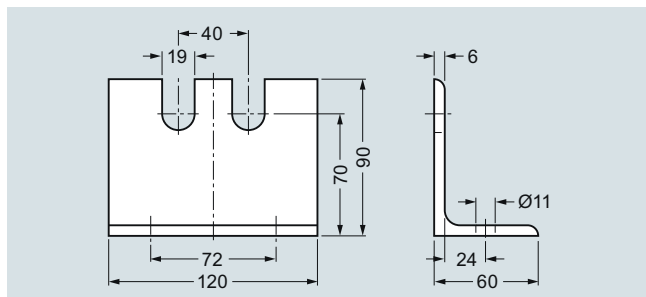


Low-pressure multiway cock, permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



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 1/2-14 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 1 1/2 inch to ASME B18.2.1, 1 flat gasket
- E34: 2 screws 7/16-20 UNF x 1 1/2 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 1/2-14 NPT, max. working pressure 420 bar (6092 psi), flange connection to IEC 61518/DIN EN 61518, form A

Material

P250GH, mat. No.: 1.0460

X 2 CrNiMo 17 13 2, mat. No. 1.4404/316L

7MF9408-2CE**7MF9408-2CL**

Selection and Ordering data

Order code

Article No.

Further designs¹⁾

Please add **"-Z"** to Article No. and specify Order code.

Accessory set to EN

2x screws 7/16-20 UNF x 1 1/2 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 1 1/2 inch to ASME B 18.2.3; chromized steel
1x O-ring to DIN 3771, 20 x 2.65 - S - FPM90, max. permissible 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. permissible 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**

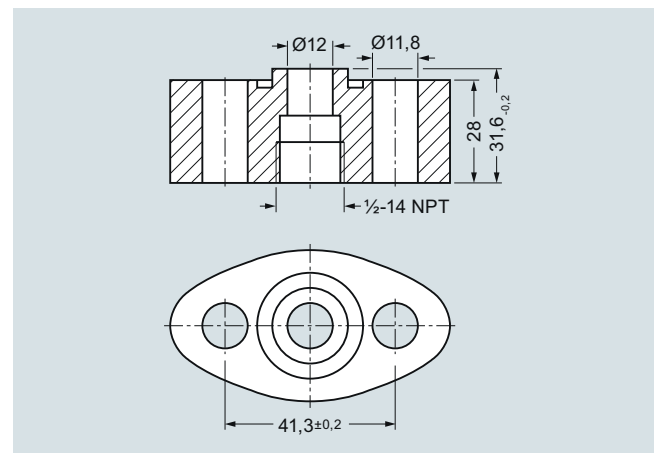
incl. acceptance test certificate 3.1 to EN 10204

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

Pressure Measurement

Fittings

Accessories

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 connection pieces are made of X 6 CrNiMoTi 17 12 2, mat. No. 1.4571 and available in 3 versions

- Thread 1/4-18 NPT and connection shank G1/2 to DIN EN 837-1
- Thread 1/2-14 NPT and connection shank G1/2 to DIN EN 837-1
- Thread 1/2-14 NPT and thread 1/2-14 NPT

Selection and Ordering data

Article No.

Mounting collar

Max. operating pressure: 689 bar (10 000 psi),
Weight: 0.2 kg

with thread 1/4-18 NPT – G1/2

7MF9001-1AA

with thread 1/2-14 NPT – G1/2

7MF9001-1CA

with thread 1/2-14 NPT – 1/2-14 NPT

7MF9001-1DA

with thread 1/2-14 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 – 1/2-14 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 – 1/2-14 NPT

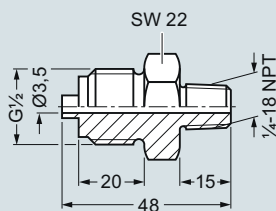
• 9 SMnPb 28, mat. No. 1.0718

7MF9008-1CC

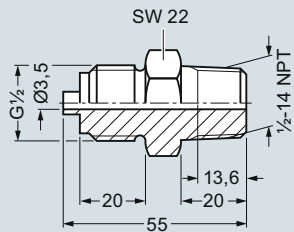
• X 6 CrNiMoTi 17 122, mat. No. 1.4571

7MF9008-1CD

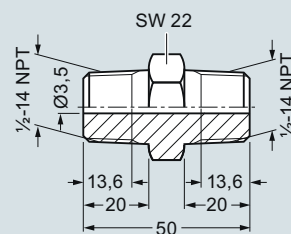
Dimensional drawings



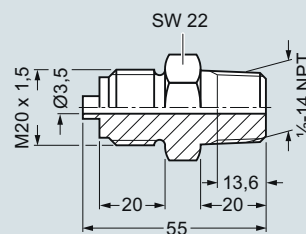
Connection piece with thread 1/4-18 NPT and connection shank G1/2 (7MF9001-1AA), dimensions in mm



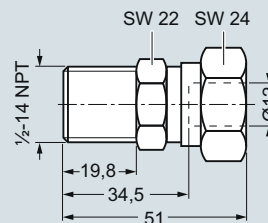
Connection piece with thread 1/2-14 NPT and connection shank G1/2 (7MF9001-1CA), dimensions in mm



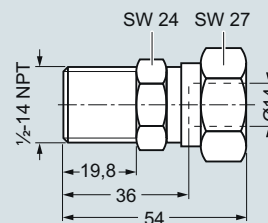
Connection piece with thread 1/2-14 NPT and thread 1/2-14 NPT (7MF9001-1DA), dimensions in mm



Connection piece with thread 1/2-14 NPT and connection shank M20 x 1.5 (7MF9001-1EA), dimensions in mm



Connection piece with pipe union with ferrule 12 S, Ø 12 mm and thread 1/2-14 NPT (7MF9008-1CA and -1CB), dimensions in mm



Connection piece with pipe union with ferrule 14 S, Ø 14 mm and thread 1/2-14 NPT (7MF9008-1CC and -1CD), dimensions in mm

Overview

Connection glands to connect medium or differential pressure lines to collars G $\frac{1}{2}$ 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)

MaterialDesign11SMn30
(mat. No. 1.0715)

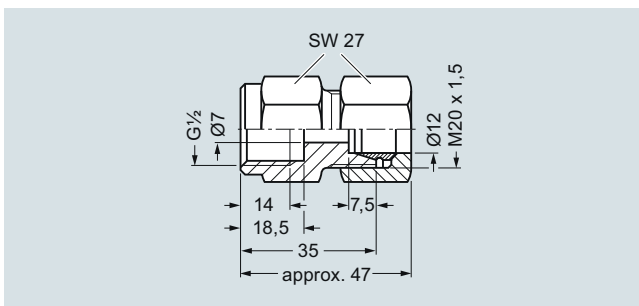
Standard

7MF9008-1GAX 6 CrNiMoTi 17 12 2
(mat. No. 1.4571/316Ti)

Standard

7MF9008-1GBX 6 CrNiMoTi 17 12 2
(mat. No. 1.4571/316Ti)

Grease-free

7MF9008-1GC**Dimensional drawings**

Connection gland 7MF9008-1G., dimensions in mm

Pressure Measurement

Fittings

Accessories

1

Connection parts G 1/2

Overview

Connection parts G $\frac{1}{2}$ 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 G $\frac{1}{2}$

for pressure gauges and shut-off fittings

Nipple connection

G $\frac{1}{2}$ to DIN 16284 (union nut with nipple and gasket); max. working pressure 400 bar (5802 psi); weight 0.1 kg;
connection: G $\frac{1}{2}$ to DIN EN 837-1;
Female thread G $\frac{1}{2}$

Material	Mat. No.
CuZn39Pb3	CW 614N

M56340-A0001

Union nut 9 SMn 28 k	1.0715
Nipple: RSt 37-2	1.0037

M56340-A0002

Union nut X 8 CrNiS 18 9	1.4305
Nipple: X 6 CrNiMoTi 17 12 2	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	1.4305
Nipple: X 6 CrNiMoTi 17 12 2	1.4571/316Ti

M56340-A0008

Clamping sleeve

G $\frac{1}{2}$ to DIN 16283; max. working pressure 400 bar (5802 psi); weight 0.1 kg;
Connections: G $\frac{1}{2}$ to DIN EN 837-1;
Female thread: G $\frac{1}{2}$ right-hand G $\frac{1}{2}$ left-hand

Material	Mat. No.
CuZn39Pb3	CW614N
9 SMn 28 k	1.0715

M56340-A0004**M56340-A0005**

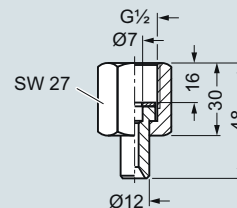
Collar-adapter

max. working pressure; weight 0.1 kg;
Connections: G $\frac{1}{2}$ to DIN EN 837-1;
Male thread: G $\frac{1}{2}$, G $\frac{1}{2}$

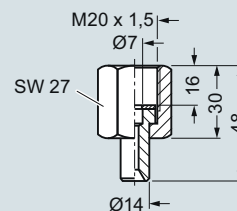
Material	Mat. No.
CuZn39Pb3	CW614N
9 SMn 28 k	1.0715

M56340-A0006**M56340-A0007**

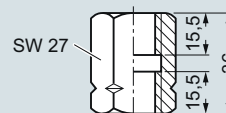
Dimensional drawings



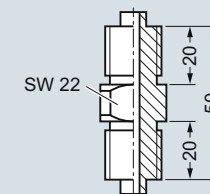
Nipple connection G $\frac{1}{2}$ (M56340-A0001 to -A0003), dimensions in mm



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 \varnothing 20 mm \times 2.6 mm on the measurement side. The connection on the device side is a clamping sleeve $G\frac{1}{2}$ 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
X 6 CrNiMoTi 17 12 2	1.4571/316Ti

P235GH	1.0345	M56340-A0043
X 6 CrNiMoTi 17 12 2	1.4571/316Ti	M56340-A0061

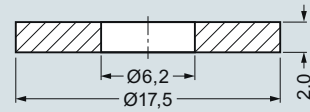
Water trap D to DIN 16282

Material	Mat. No.
P235GH	1.0345
X 6 CrNiMoTi 17 12 2	1.4571/316Ti

P235GH	1.0345	M56340-A0045
X 6 CrNiMoTi 17 12 2	1.4571/316Ti	M56340-A0063

Overview

The sealing rings to EN 837-1 are required to seal measuring instruments for pressure with the process connection $G\frac{1}{2}B$.

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 $G\frac{1}{2}$ **made of**

(packing unit 100 pcs)

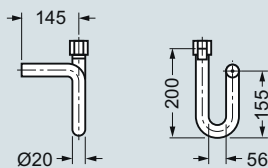
- Copper
- Soft iron
- Stainless steel, mat.-No. 1.4571
- PTFE

7MF9007-7AA**7MF9007-7AB****7MF9007-7AC****7MF9007-7AD****Accessories**

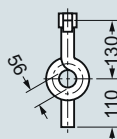
Test report to EN 10204-3.1

7MF9000-8AB

Material acceptance test certificate to EN 10204-3.1

7MF9000-8AD**Dimensional drawings**

Water traps, type B, M56340-A0043/-A0061, dimensions in mm



Water traps, type D, M56340-A0045/-A0063, dimensions in mm

Pressure Measurement

Fittings

Accessories

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

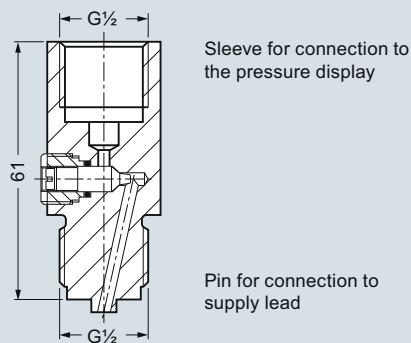
Article No.

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



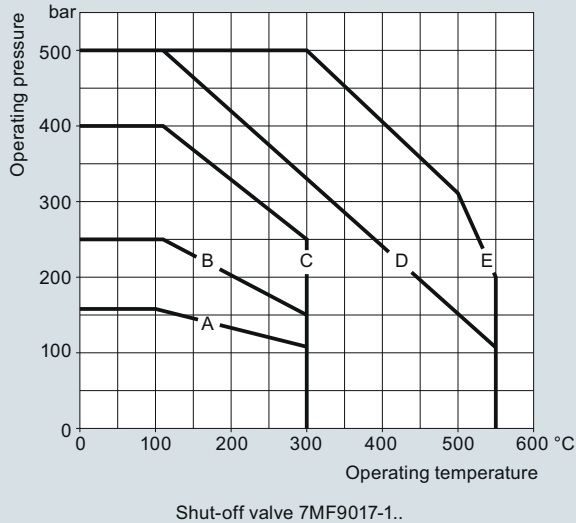
Pressure surge reducer, dimensions in mm

Overview

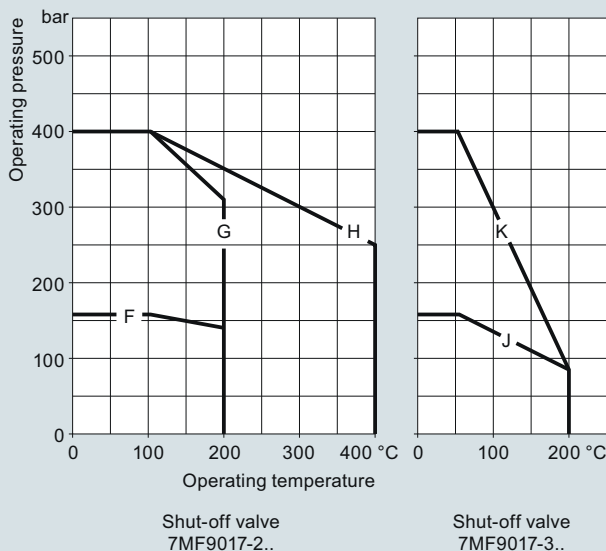
Primary shut-off valves are available in the following versions:

- For non-corrosive liquids, gases and vapors
- For corrosive liquids and gases
- Grease-free for oxygen

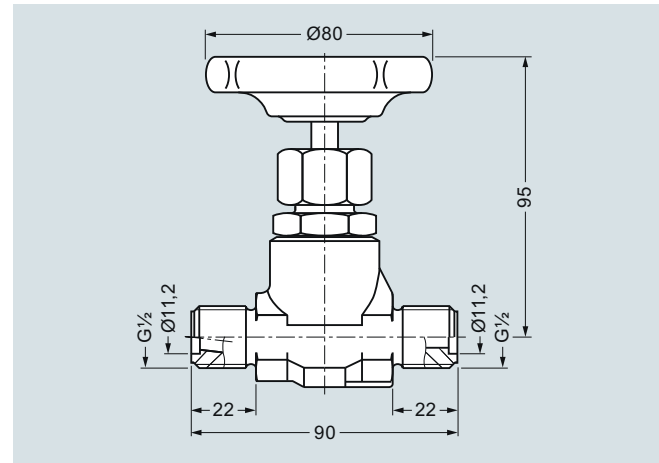
The shut-off valves are available in various materials and with various connections (see Selection and Ordering data)

Characteristic curves

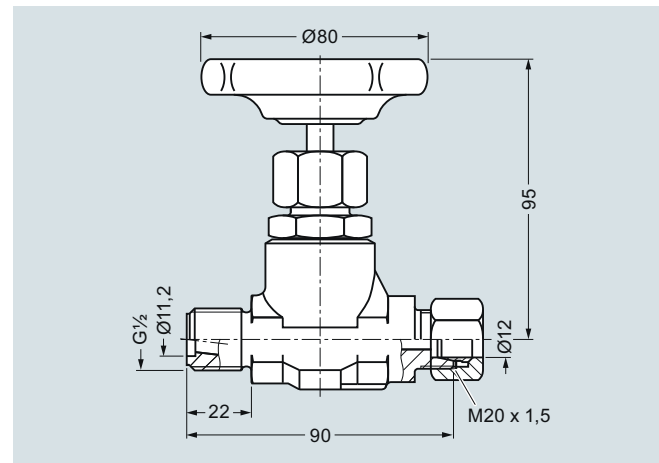
Shut-off valve 7MF9017-1.., permissible working pressure as a function of the permissible working temperature



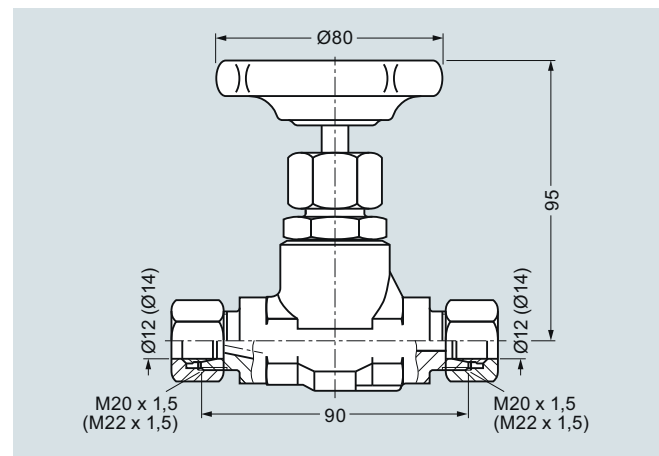
Shut-off valve 7MF9017-2.. and -3.., permissible working pressure as a function of the permissible working temperature

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

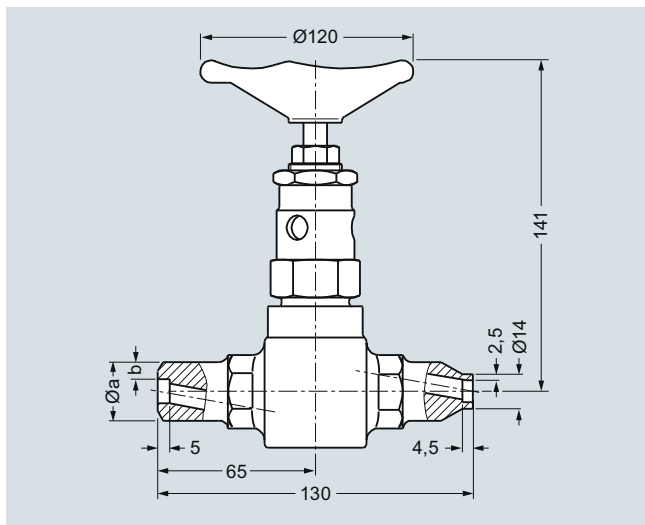
Pressure Measurement

Fittings

Accessories

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
➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.							A
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 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 x 2.5 mm	1.6	F
500 bar (7252 psi)	E	11 CrMo 9 10	1.7383	External	Welding sleeves Ø 14 mm x 2.5 mm	1.6	G
500 bar (7252 psi)	D	16 Mo 3	1.5415	External	Welding sleeves Ø 21.3 mm x 6.3 mm and Ø 14 mm x 2.5 mm	1.6	H
500 bar (7252 psi)	D	16 Mo 3	1.5415	External	Welding sleeves Ø 24 mm x 7.1 mm and Ø 14 mm x 2.5 mm	1.6	J
500 bar (7252 psi)	E	11 CrMo 9 10	1.7383	External	Welding sleeves Ø 24 mm x 7.1 mm and Ø 14 mm x 2.5 mm	1.6	K
Shut-off valve for aggressive liquids and gases							7MF9017-2
160 bar (2321psi)	F	X 6 CrNiMoTi 17 12 2	1.4571/316Ti	Internal	Threaded socket G½ form R, 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 x 6.3 mm and Ø 14 mm x 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 x 7.1 mm and Ø 14 mm x 2.5 mm	1.6	J

Accessories

Factory test certificate EN 10204-2.2

Material acceptance test certificate EN 10204-3.1

¹⁾ See Figure "Permissible working pressure as a function of the permissible working temperature"

7MF9000-8AB
7MF9000-8AD

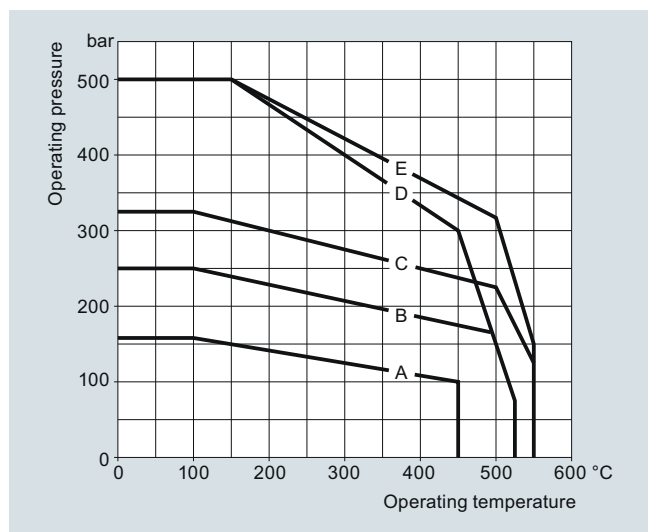
Overview

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.

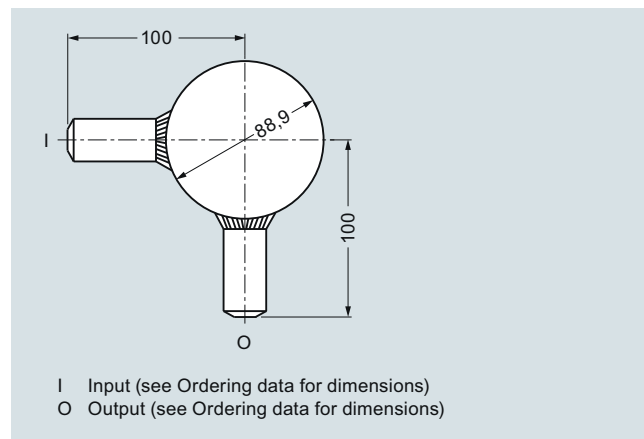
A material acceptance test certificate A to EN 10204-3.1 is available for the materials from which the compensation vessels are made.

Characteristic curves

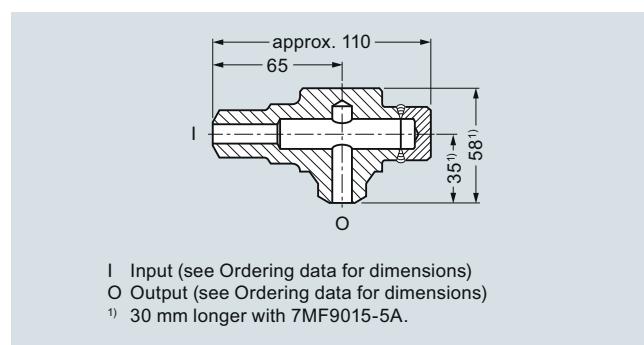


Permissible operating pressure as a function of the permissible operating temperature

Dimensional drawings



Compensation vessel 7MF9015-1..., dimensions in mm



Compensation vessel 7MF9015-5..., dimensions in mm

Selection and Ordering data

Compensation vessel, without certificate

Max. working pressure	Charac- teristic ¹⁾	Material	Mat. No.	Connections Input	Output	Approx. contents cm ³	Approx. weight kg	Article No.
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	7MF9015-1A
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	7MF9015-1B
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	7MF9015-1C
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	7MF9015-1D
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	7MF9015-1E
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	7MF9015-5A
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	7MF9015-5B
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	7MF9015-5C
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	7MF9015-5D

Accessories

Factory test certificate EN 10204-2.2

Material acceptance test certificate EN 10204-3.1

1) See Figure "Permissible working pressure as a function of the permissible working temperature"

7MF9000-8AB
7MF9000-8AD

Pressure Measurement

Fittings

Accessories

1

Connection parts

Overview

Connection parts are available in the following versions:

- Threaded flange pair G $\frac{1}{2}$ with stainless steel gasket
- Nipple G $\frac{1}{2}$ form V to DIN 19207
- Union nut G $\frac{1}{2}$ made of C 35 to DIN 16284
- Gasket B $\frac{1}{2}$ (grooved) to DIN 19207

All connection parts are also available grease-free for oxygen.

Selection and Ordering data

Article No.

Threaded flange pair G $\frac{1}{2}$

- with stainless steel gasket
- grease-free for oxygen, with stainless steel gasket

Scope of delivery:

2x threaded flanges G $\frac{1}{2}$ 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 G $\frac{1}{2}$ (7MF9007-6BA) grooved, to DIN 19207; Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

Only for 7MF9007-4CA!

1x gasket G $\frac{1}{2}$ (7MF9007-6CA), grease-free for oxygen, grooved, to DIN 19207; Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

Only for 7MF9007-4DA!

7MF9007-4CA**7MF9007-4DA**

Nipple G $\frac{1}{2}$

to DIN 19207

- Material: 16 Mo 3 (mat. No. 1.5415)
- grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

7MF9007-4KA**7MF9007-4LA**

Union nut G $\frac{1}{2}$

to DIN 16284

- Material: C35E (mat. No. 1.1181)
- grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

7MF9007-4MA**7MF9007-4NA**

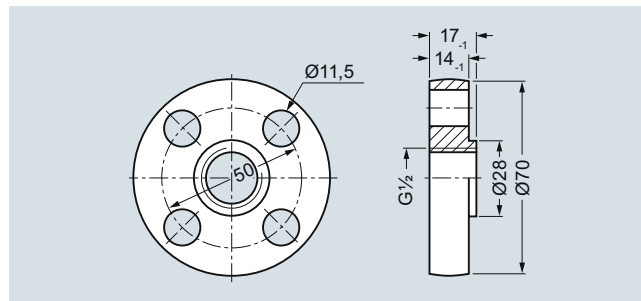
Gasket G $\frac{1}{2}$

to DIN 19207, grooved

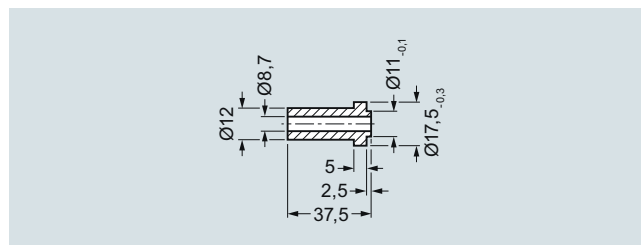
- Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)
- grease-free for oxygen, Material: X 6 CrNiMoTi 17 12 2 (mat. No. 1.4571/316Ti)

7MF9007-6BA**7MF9007-6CA**

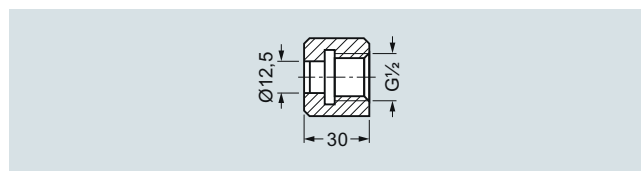
Dimensional drawings



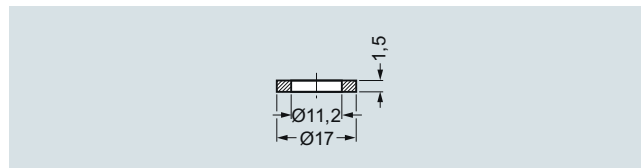
Threaded flange 7MF9007-4CA/-4DA, dimensions in mm



Nipple G $\frac{1}{2}$ 7MF9007-4KA/-4LA, dimensions in mm



Union nut G $\frac{1}{2}$ 7MF9007-4MA/-4NA, dimensions in mm



Gasket 7MF9007-6BA/-6CA, dimensions in mm