

Pressure Measurement

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

Technical description

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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 NE 107
- SIL devices developed according to IEC 61508
- SIL validation on the device or remotely with SIMATIC PDM
- Reduction of internal inductance for Ex applications to LI = 0
- Step response time for pressure type T63 = 105 ms and for differential pressure type 135 ms.
- Minimal conformity error
- Very low temperature influence
- Very good long-term stability
- High quality and service life
- High reliability even under extreme chemical and mechanical loads
- For corrosive and non-corrosive gases, vapors and liquids
- Extensive diagnostics and simulation functions
- Separate replacement of measuring cell and electronics without recalibration
- Wetted parts made of high-grade materials (e.g., stainless steel, alloy, gold, Monel, tantalum)
- Infinitely adjustable measuring spans from 0.01 bar to 700 bar (0.15 psi to 10153 psi)
- Convenient parameterization over 4 input buttons and HART interface

Application

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

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

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

The pressure transmitter can be operated locally over 4 input buttons or programmed externally over HART interface.

Pressure transmitter for gauge pressure

Measured variable:

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

Measuring span (infinitely adjustable)

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

There are two series:

- Gauge pressure series
- Differential pressure series

Pressure transmitters for absolute pressure

Measured variable:

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

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 8.3 mbar a to 100 bar a (0.12 to 1450 psi a)

There are two series:

- Gauge pressure series
- Differential pressure series

Pressure transmitters for differential pressure and flow

Measured variables:

- Differential pressure
- Small positive or negative overpressure
- Flow $q \sim \sqrt{\Delta p}$ (together with a primary differential pressure transducer (see section "Flow meters"))

Measuring span (infinitely adjustable)

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

Pressure transmitters for level

Measured variable:

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

Measuring span (infinitely adjustable)

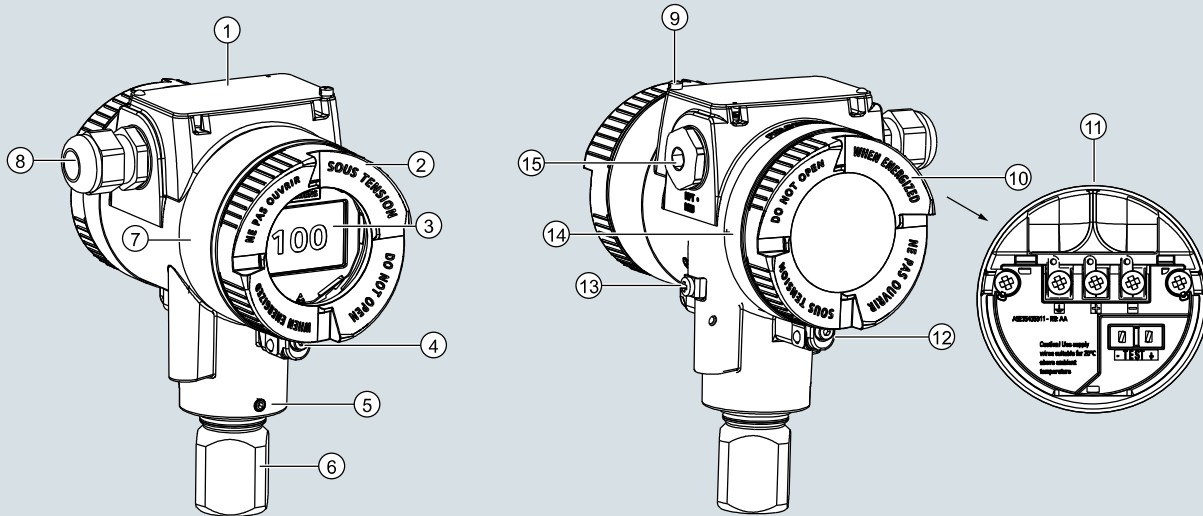
- For SITRANS P320/P420 with HART: 25 mbar to 5 bar (0.363 to 72.5 psi)

Type of the mounting flange:

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

Design

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



- ① Cover over buttons and nameplate with general information
- ② Cover (front) with glass pane (optional)
- ③ Display (optional)
- ④ Safety catch (front)
- ⑤ Locking screw for locking the enclosure
- ⑥ Process connection
- ⑦ Approval label with approval information
- ⑧ Cable inlet, optionally with cable gland

- ⑨ Locking screw for the cover over the buttons
- ⑩ Cover (rear) for electrical terminal compartment
- ⑪ Electrical terminal compartment
- ⑫ Safety catch (back)
- ⑬ Ground terminal
- ⑭ Nameplate with information on the remote seal
- ⑮ Blanking plug

Device front view

- The electronics enclosure is made of die cast aluminum or precision cast stainless steel.
- The enclosure has a removable circular cover at the front and the back.
- Depending on the device version, the front cover (2) may be designed as an inspection window.
- The cable inlet (8) to the electrical terminal compartment is at the side; either the left or right-hand one can be used. The unused opening is closed with a blanking plug (15).
- The ground terminal (13) is located on the side.

- The electrical terminal compartment (11) for the auxiliary power and shield is accessible when you remove the back cover (10).
- The measuring cell with process connection (6) is located in the bottom part of the enclosure. The measuring cell is prevented from rotating by a locking screw (5).
- Thanks to the modular design of the pressure transmitter, the measuring cell and application electronics or terminal compartment can be replaced if required.
- The cover over buttons (1), under which there are 4 buttons, is located on the upper face of the enclosure. The nameplate with general information is located on the cover over the buttons.

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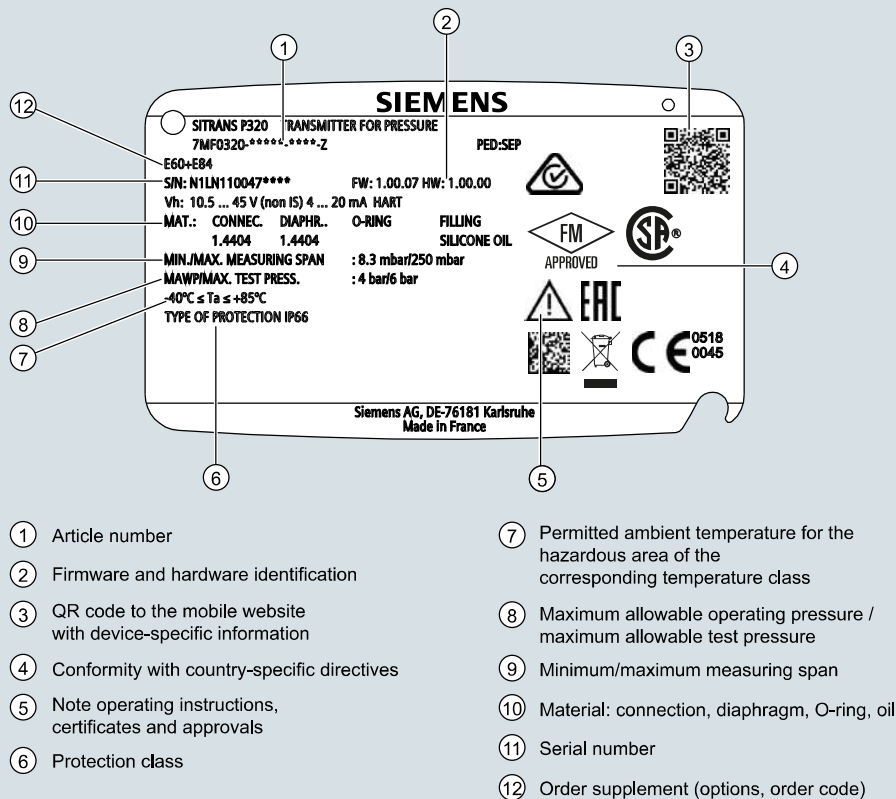
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Technical description

Nameplates

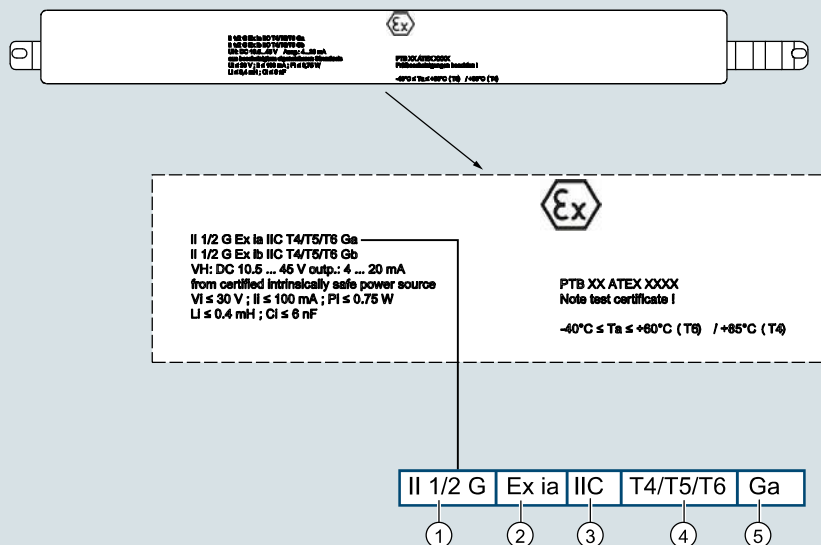
Nameplate

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

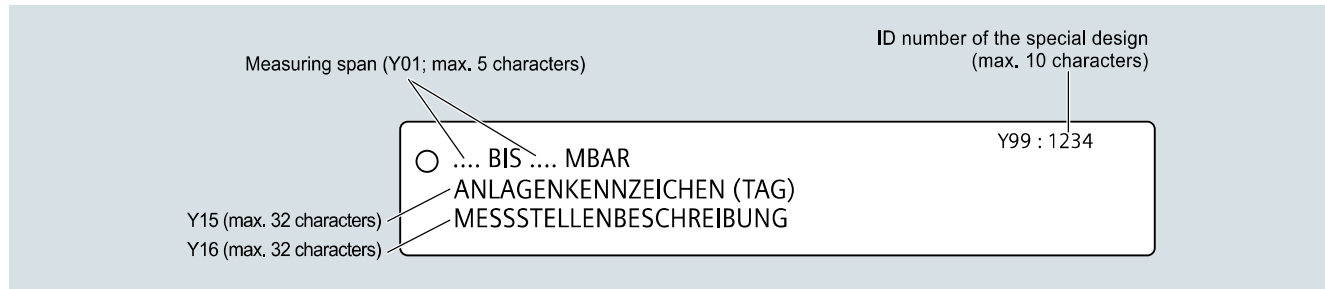
The approval label with approval information is located on the front of the enclosure.



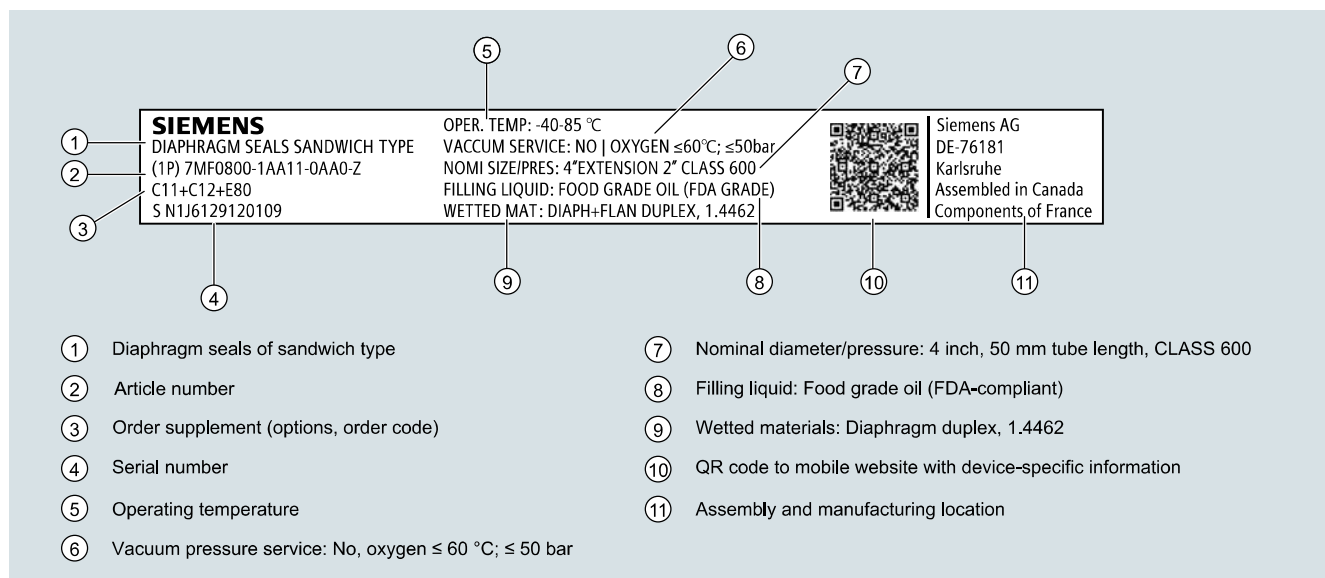
- ① Characteristics of the hazardous area
- ② Type of protection
- ③ Group (gas, dust)
- ④ Maximum surface temperature (temperature class)
- ⑤ Device protection level

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.



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Function

Adjustable parameters and diagnostics

SITRANS P320/P420 with HART communication

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

Available physical units of display for SITRANS P320/P420

Physical variable	Physical dimensions
Pressure (setting can also be made in the factory)	Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm ² , kg/cm ² , kgf/cm ² , inH 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		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086) (for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar	4 bar	6 bar
	0.83 ... 25 kPa	0.4 MPa	0.6 MPa
	0.12 ... 3.6 psi	58 psi	87 psi
	0.01 ... 1 bar	6 bar	9 bar
	1 ... 100 kPa	0.6 MPa	0.9 MPa
	0.15 ... 14.5 psi	87 psi	130 psi
	0.04 ... 4 bar	20 bar	30 bar
	4 ... 400 kPa	2 MPa	3 MPa
	0.58 ... 58 psi	290 psi	435 psi
	0.16 ... 16 bar	45 bar	70 bar
	0.016 ... 1.6 MPa	4.5 MPa	7 MPa
	2.3 ... 232 psi	652 psi	1015 psi
	0.63 ... 63 bar	80 bar	120 bar
	0.063 ... 6.3 MPa	8 MPa	12 MPa
	9.1 ... 914 psi	1160 psi	1740 psi
	1.6 ... 160 bar	240 bar	360 bar
	0.16 ... 16 MPa	24 MPa	36 MPa
	23 ... 2321 psi	3481 psi	5221 psi
	4 ... 400 bar	400 bar	600 bar
	0.4 ... 40 MPa	40 MPa	60 MPa
	58 ... 5802 psi	5802 psi	8702 psi
	7 ... 700 bar	800 bar	800 bar
	0.7 ... 70 MPa	80 MPa	80 MPa
	102 ... 10153 psi	11603 psi	11603 psi
Measuring limits	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/temperature of medium)		
• Upper measuring limit	Between the measuring limits (infinitely adjustable)		
• Lower range value			
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	<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	-		

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for gauge pressure (pressure series)

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

Measuring accuracy

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, Turn-Down)

- Linear characteristic

- 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

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

$r \leq 1.25$: $\leq 0.075\%$ (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

- 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

$\leq (0.25 \cdot r)\%$ 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 $\leq (0.15 \cdot r)\%$

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)**Operating conditions**

Temperature of medium

- Measuring cell with silicone oil filling -40 ... +100 °C (-40 ... +212 °F)
- Measuring cell with inert oil
 - 1 bar/100 kPa/14.5 psi -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 enclosure
 - 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

- Connection shank G1/2A according to DIN EN 837-1
- Female thread ½-14 NPT
- Male thread M20 x 1.5 and ½-14 NPT
- Oval flange (PN 160 (MWP 2320 psi g)) with fastening screw thread:
 - 7/16-20 UNF according to EN 61518
 - M10 according to DIN 19213
- Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread:
 - 7/16-20 UNF according to EN 61518
 - M12 according to DIN 19213
- Male thread M20 x 1.5 and ½-14 NPT

Electrical connection

- Cable entry via the following screwed glands:
- M20 x 1.5
 - ½-14 NPT
 - Device plug Han 7D/Han 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)

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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)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$
- 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
- 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 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 temperature of measuring medium - "ec" 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) <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>1) Han 8D is identical to Han 8U.</p>	<p>Ex II 3G Ex ec IIC T4/T6 Gc</p> <p>-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6</p> <p>-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</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> <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>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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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	0
Measuring cell filling	
Silicone oil	1
Inert liquid	3
Neobee oil	4
Maximum measuring span	
250 mbar (3.6 psi)	F
1000 mbar (14.5 psi)	J
4000 mbar (58 psi)	N
16 bar (232 psi)	Q
63 bar (914 psi)	T
160 bar (2321 psi)	V
400 bar (5802 psi)	W
700 bar (10153 psi)	X
Process connection	
Male thread M20 x 1.5	B
Male thread G½ (DIN EN 837-1)	D
Female thread ½-14 NPT	E
Male thread ½-14 NPT	F
Oval flange, mounting thread: 7/16-20 UNF (IEC 61518)	G
Oval flange, mounting thread: M10 (DIN 19213)	H
Oval flange, mounting thread: M12 (DIN 19213)	J
Version for diaphragm seal pressure	U
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404	0
Stainless steel 316L/1.4404, alloy C276/2.4819	1
Alloy C22/2.4602, alloy C276/2.4819	2
Non-wetted parts materials	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
Enclosure	
Dual chamber device	5
Type of protection	
Without Ex	A
Intrinsic safety	B
Flameproof enclosure	C
Flameproof enclosure, intrinsic safety	D
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	L
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	M
Combination of options B, C and L (zone model)	S
Combination of options B, C and M (zone model, Class DCable gland must be ordered separately as option (Axx)ivision)	T
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	F
• 2 x ½-14 NPT	M
Local operation/display	
Without display (cover closed)	0
With display (cover closed)	1
With display (cover with glass pane)	2

Selection and ordering data

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

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

Pressure Measurement

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

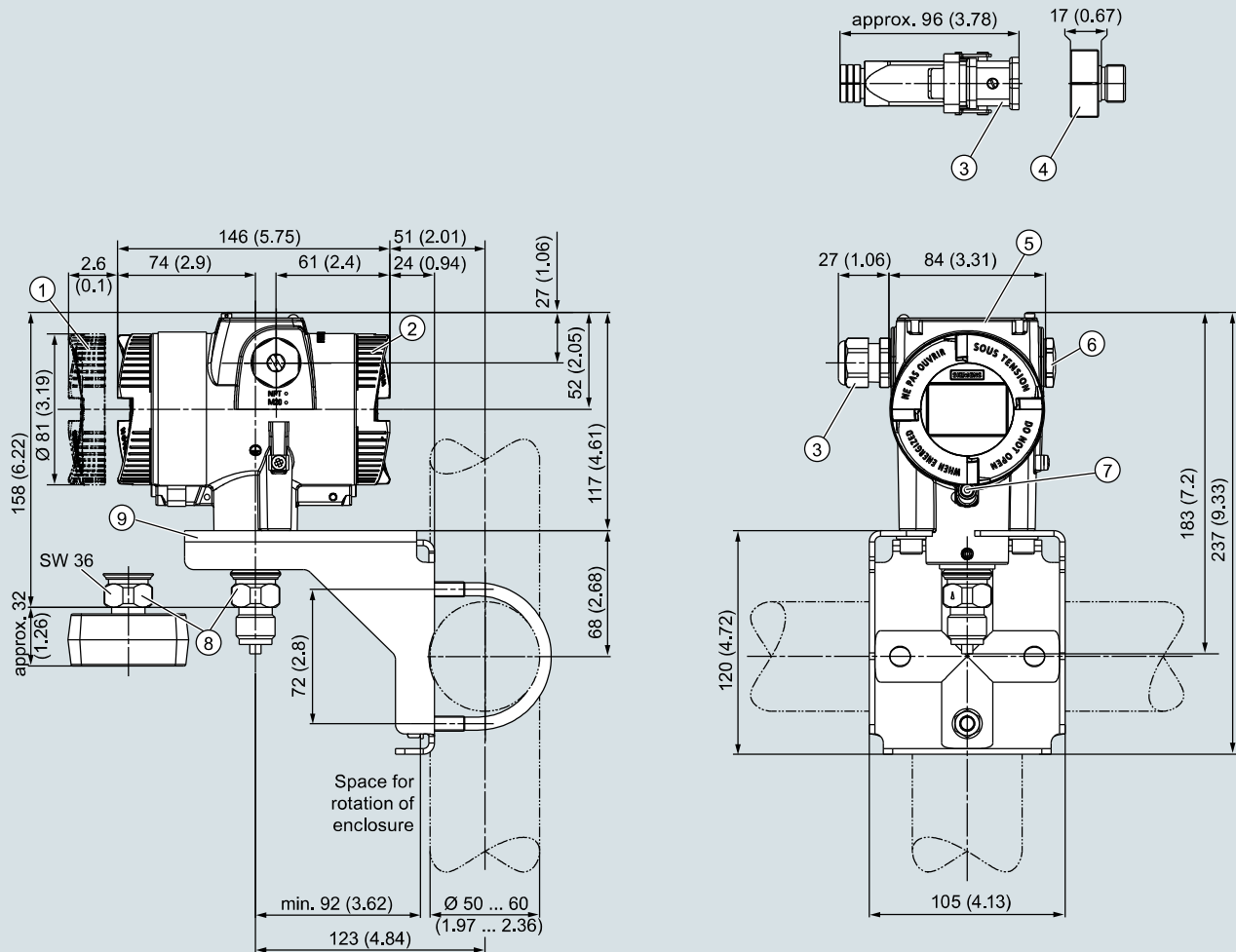
1

for gauge pressure (pressure series)

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

Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Device settings	
Measuring span	Y01
Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm ² , kg/cm ² , kgf/cm ² , inH ₂ O, inH ₂ O (4°C), ftH ₂ O, mmH ₂ O, mmH ₂ O (4°C), mH ₂ O (4°C), mmHg, inHg, atm, torr	
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Input field: Free text, max. 32 characters	
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
Input field: Free text, max. 32 characters	
TAG short (device parameters, max. 8 characters)	Y17
Input field: Free text, max. 8 characters	
Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge	Y21
Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	
Local display Scaling with standard units [m ³ /s, l/s, m, inch, ...], example 1 ... 5 m	Y22
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.	
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
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)

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)**Measuring accuracy**

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

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

• Linear characteristic

- 20 mbar/2 kPa/8.031 inH₂O $r \leq 5: \leq 0.075\%$ - 60 mbar/6 kPa/24.09 inH₂O $5 < r \leq 20: \leq (0.005 \cdot r + 0.05)\%$

- 250 mbar/25 kPa/3.6 psi

 $r \leq 5: \leq 0.075\%$ 600 mbar/60 kPa/240.9 inH₂O $5 < r \leq 60: \leq (0.005 \cdot r + 0.05)\%$ 1600 mbar/160 kPa/642.4 inH₂O $r \leq 5: \leq 0.065\% \text{ (SITRANS P320)}$ 5000 mbar/500 kPa/2008 inH₂O $\leq 0.04\% \text{ (SITRANS P420)}$

30 bar/3 MPa/435 psi

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

• 100 bar/10 MPa/1450 psi

 $r < 10: = 0.1\%$ $10 < r < 30: = 0.2\%$

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

• 20 mbar/2 kPa/8.031 inH₂O $\leq (0.15 \cdot r + 0.1)\%$ • 60 mbar/6 kPa/24.09 inH₂O $\leq (0.075 \cdot r + 0.1)\%$

• 250 mbar/25 kPa/3.6 psi

 $\leq (0.025 \cdot r + 0.125)\% \text{ (SITRANS P320)}$ 600 mbar/60 kPa/240.9 inH₂O1600 mbar/160 kPa/642.4 inH₂O5000 mbar/500 kPa/2008 inH₂O

30 bar/3 MPa/435 psi

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

• 250 mbar/25 kPa/3.6 psi

 $\leq (0.0125 \cdot r + 0.0625)\% \text{ (SITRANS P420)}$ 5000 mbar/500 kPa/2008 inH₂O

30 bar/3 MPa/435 psi

 $0.08 \cdot r + 0.16\%$

• 100 bar/10 MPa/1450 psi

Long-term stability at ± 30 °C (± 54 °F)• 20 mbar/2 kPa/8.031 inH₂O $\leq (0.2 \cdot r)\%$ per year• 60 mbar/6 kPa/24.09 inH₂OIn 5 years $\leq (0.25 \cdot r)\%$

• 250 mbar/25 kPa/3.6 psi

In 5 years $\leq (0.125 \cdot r)\%$ 600 mbar/60 kPa/240.9 inH₂OIn 10 years $\leq (0.15 \cdot r)\%$ 1600 mbar/160 kPa/642.4 inH₂O5000 mbar/500 kPa/2008 inH₂O

• 30 bar/3 MPa/435 psi

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

• 100 bar/10 MPa/1450 psi

• 20 mbar/2 kPa/8.031 inH₂O

Approx. 0.160 s

• 60 mbar/6 kPa/24.09 inH₂O

Approx. 0.150 s

• 250 mbar/25 kPa/3.6 psi

Approx. 0.135 s

600 mbar/60 kPa/240.9 inH₂O1600 mbar/160 kPa/642.4 inH₂O5000 mbar/500 kPa/2008 inH₂O

30 bar/3 MPa/435 psi

Approx. 0.145 s

• 100 bar/10 MPa/1450 psi

• 20 mbar/2 kPa/8.031 inH₂O $\leq 0.7 \text{ mbar}/0.07 \text{ kPa}/0.010 \text{ psi}$ per 10° incline• 60 mbar/6 kPa/24.09 inH₂O

(zero offset is possible with position error compensation)

• 250 mbar/25 kPa/3.6 psi

0.005% per 1 V

600 mbar/60 kPa/240.9 inH₂O5000 mbar/500 kPa/2008 inH₂O

30 bar/3 MPa/435 psi

Operating conditions

Temperature of medium

• Measuring cell with silicone oil filling

- Measuring cell 30 bar (435 psi)

-40 ... +100 °C (-40 ... +212 °F)

- Measuring cell 100 bar (1450 psi)

-20 ... +100 °C (-4 ... +212 °F)

• Measuring cell with inert oil

-20 ... +100 °C (-4 ... +212 °F)

• In conjunction with dust explosion protection

-20 ... +100 °C (-4 ... +212 °F)

-40 ... +85 °C (-4 ... +185 °F)

Ambient conditions

• Ambient temperature/enclosure

Observe the temperature class in areas subject to explosion hazard.

- Measuring cell with silicone oil filling

-40 ... +85 °C (-40 ... +185 °F)

- Measuring cell with inert oil

-40 ... +85 °C (-40 ... +185 °F)

- Display

-20 ... +80 °C (-4 ... +176 °F)

• Storage temperature

-50 ... +85 °C (-58 ... +185 °F)

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

4K4H

• Degree of protection

- According to IEC 60529

IP66, IP68

- According to NEMA 250

Type 4X

• Electromagnetic compatibility

- Emitted interference and interference immunity

According to IEC 61326 and NAMUR NE 21

Pressure Measurement

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

for gauge pressure (differential pressure series)

1

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	
<ul style="list-style-type: none"> • Wetted parts materials <ul style="list-style-type: none"> - Seal diaphragm - Process flanges and sealing plugs - O-ring • Non-wetted parts materials <ul style="list-style-type: none"> - Electronics enclosure - 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 <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 <ul style="list-style-type: none"> 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	¼-18 NPT female thread and flat connection with 7/16-20 UNF fastening screw thread in accordance with EN 61518 or M10 fastening screw thread in accordance with DIN 19213 (M12 for PN 420 (MWP 6092 psi))
Electrical connection	Screw terminals Cable entry via the following screwed glands: <ul style="list-style-type: none"> • M20 x 1.5 • ½-14 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	
<ul style="list-style-type: none"> • 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	
<ul style="list-style-type: none"> • Intrinsic safety "i" <ul style="list-style-type: none"> - Marking - Permissible ambient temperature - Permissible temperature of measuring medium - Connection - Effective internal inductance/capacitance • Flameproof enclosure "d" <ul style="list-style-type: none"> - 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 ... +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 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 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: $U_n = 10.5 \text{ to } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

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 temperature of measuring medium - "ec" 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) 	<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 -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 -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °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</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>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 (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	0
Measuring cell filling	
Silicone oil	1
Inert filling liquid	3
Maximum measuring span	
20 mbar (8.037 inH ₂ O)	B
60 mbar (24.11 inH ₂ O)	D
250 mbar (1005 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: $\frac{7}{16}$ -20 UNF (IEC 61518)	L
Oval flange, mounting thread: M10 (PN 160), (DIN 19213)	M
Oval flange, mounting thread: $\frac{7}{16}$ -20 UNF (IEC 61518) with lateral ventilation	N
Oval flange, mounting thread: M10 (PN 160) (DIN 19213) with lateral ventilation	P
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	0
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	1
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408	2
Tantalum/tantalum, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	4
Monel 00/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	6
Stainless steel 316L/1.4404, gold-plated, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	8
Non-wetted parts materials	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
Enclosure	
Dual chamber device	5
Type of protection	
Without Ex	A
Intrinsic safety	B
Flameproof enclosure	C
Flameproof enclosure, intrinsic safety	D
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	L
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	M
Combination of options B, C and L (zone model)	S
Combination of options B, C and M (zone model, Class Division)	T
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	F
• 2 x ½-14 NPT	M
Local operation/display	
Without display (cover closed)	0
With display (cover closed)	1
With display (cover with glass pane)	2

Selection and ordering data

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

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

Pressure Measurement

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

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for gauge pressure (differential pressure series)

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

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

Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	Y01
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	
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Input field: Free text, max. 32 characters	
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
Input field: Free text, max. 32 characters	
TAG short (device parameters, max. 8 characters)	Y17
Input field: Free text, max. 8 characters	
Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge	Y21
Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	
Local display Scaling with standard units [m ³ /s, l/s, m, inch, ...], example 1 ... 5 m	Y22
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.	
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
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	

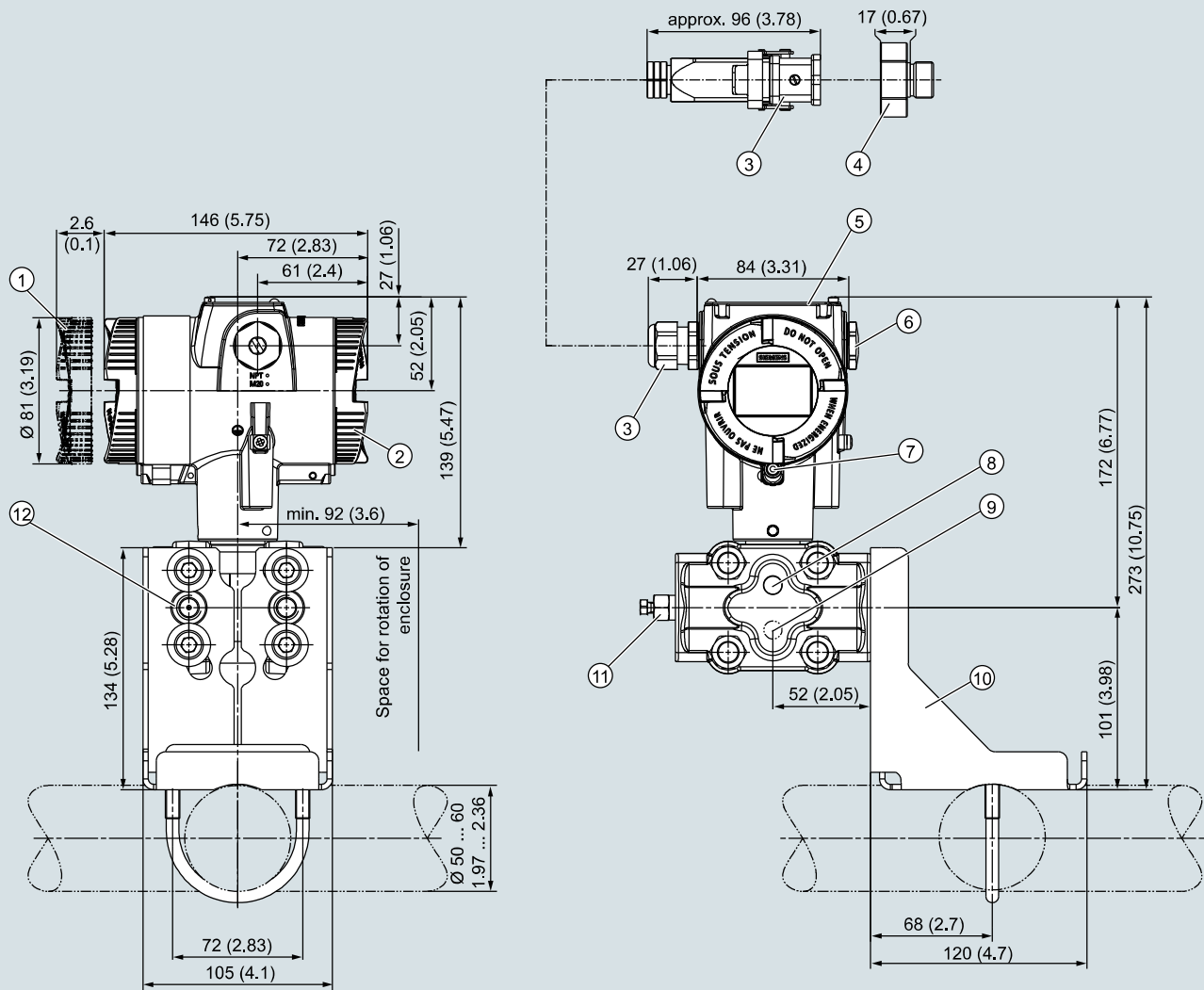
Pressure Measurement

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

for gauge 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 8D²⁾³⁾ device plug • M12 device plug²⁾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 relative pressure (differential pressure series), dimensions in mm (inch)

Technical specifications

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

Input of gauge pressure, with flush-mounted diaphragm

Measured variable

Gauge pressure

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

Measuring span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

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

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. measuring span

Input of absolute pressure, with flush-mounted diaphragm

Measured variable

Absolute pressure

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

Measuring span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

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 measuring 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. measuring span

Lower range value

Between the measuring limits (infinitely adjustable)

Output

HART

Output signal

4 ... 20 mA

• Low saturation limit (infinitely adjustable)

3.55 mA, factory preset to 3.8 mA

• High saturation limit (infinitely adjustable)

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

• Ripple (without HART communication)

 $I_{pp} \leq 0.5\%$ of max. output current

Adjustable damping

0 ... 100 s, continuously adjustable over remote operation

0 ... 100 s, in increments of 0.1 s, adjustable over display

• Current transmitter

3.55 ... 22.8 mA

• Failure signal

3.55 ... 22.8 mA

Load

Resistor R [Ω]

• Without HART communication

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

-

Pressure Measurement

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

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for gauge and absolute pressure, flush-mounted diaphragm

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

Gauge pressure measuring accuracy, with flush-mounted diaphragm

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, Turn-Down)

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

• Linear characteristic

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

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

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

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 temperature of medium
(in pressure per temperature unit)

- Temperature difference between temperature of medium and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

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

- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

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

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

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

≤ 0.105 s

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

0.4 mbar/0.04 kPa/0.006 per 10° incline
(zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

Absolute pressure measuring accuracy with flush diaphragm

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, Turn-Down)

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

• Linear characteristic

- All measuring cells

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

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

Influence of ambient temperature

in % per 28 °C (50 °F)

- All measuring cells

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

Influence of the temperature of medium

(in pressure per temperature unit)

- Temperature difference between temperature of medium and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

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

- All measuring cells

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

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

≤ 0.105 s

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

0.4 mbar/0.04 kPa/0.006 per 10° incline
(zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm**Operating conditions**Temperature of medium²⁾

- Measuring cell with silicone oil filling -40 ... +150 °C (-40 ... +302 °F)
-40 ... +200 °C (-40 ... +392 °F) with cooling extension
- Measuring cell with inert oil -20 ... +100 °C (-4 ... +212 °F)
- Measuring cell with FDA-compliant oil -10 ... +150 °C (14 ... +302 °F)

Ambient conditions

- Ambient temperature/enclosure
 - Measuring cell with silicone oil filling -40 ... +85 °C (-40 ... +185 °F)
 - Measuring cell with inert oil (different pressure classes) -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 (pressure transmitter without mounting flange)

Material

- Wetted parts materials
 - Process connection
 - Seal diaphragm
- Non-wetted parts materials
 - Electronics enclosure

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

- Mounting bracket

- 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)
- Steel, electrogalvanized steel, or stainless steel

Process connection

- Flanges according to EN and ASME
- F&B and pharmaceutical flanges
- BioConnect/BioControl
- PMC style

Electrical connection

- Cable entry via the following screwed glands:
- M20 x 1.5
 - ½-14 NPT
 - Device plug Han 7D/Han 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} ≤ 0.2 V (47 ... 125 Hz)

Noise

U_{eff} ≤ 1.2 mV (0.5 ... 10 kHz)

Auxiliary power

-

Separate supply voltage

-

Pressure Measurement

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

1

for gauge and absolute pressure, flush-mounted diaphragm

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 temperature of measuring medium
 - "ec" 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

-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

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

-40 ... +40 °C (-40 ... +104 °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:

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

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

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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

Selection and ordering data

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

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

Pressure Measurement

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

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for gauge and absolute pressure, flush-mounted diaphragm

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

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

Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm ² , kg/cm ² , kgf/cm ² , inH 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

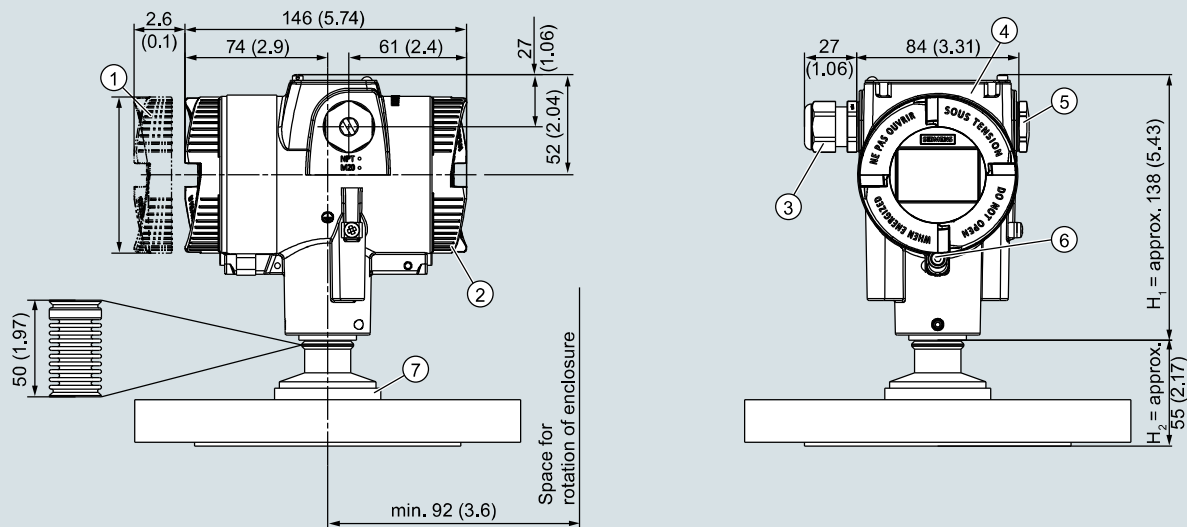
Pressure Measurement

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

for gauge and absolute pressure, flush-mounted diaphragm

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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 + XPI]"

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 .

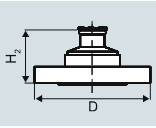
H_1 = Height of the SITRANS P320/P420 up to a defined cross-section

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

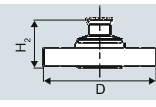
Only the height H_2 is indicated in the dimensions of the flanges.

Flanges according to EN and ASME

Flange according to EN

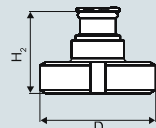
EN 1092-1					
	Order code	DN	PN	ØD	H ₂
	M03	50	16	165 mm (6.5")	Approx. 52 mm (2")
	M05	80	16	200 mm (7.9")	
	M10	25	40	115 mm (4.5")	
	M12	40	40	150 mm (5.9")	
	M13	50	40	165 mm (6.5")	
	M15	80	40	200 mm (7.9")	
	M22	40	100	170 mm (6.7")	

Flanges according to ASME

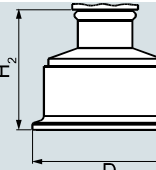
ASME B16.5					
	Order code	DN	Class	ØD	H ₂
	M30	1"	150	110 mm (4.3")	Approx. 52 mm (2")
	M31	1½"	150	125 mm (4.9")	
	M32	2"	150	150 mm (5.9")	
	M33	3"	150	190 mm (7.5")	
	M34	4"	150	230 mm (9.1")	
	M36	1½"	300	155 mm (6.1")	
	M37	2"	300	165 mm (6.5")	
	M38	3"	300	210 mm (8.1")	
	M39	4"	300	255 mm (10.0")	

NuG and pharmaceutical connections

Connections to DIN

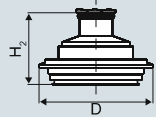
DIN 11851 (milk pipe union with slotted union nut)					
	Order code	DN	PN	ØD	H ₂
	N03	50	25	92 mm (3.6")	Approx. 52 mm (2")
	N05	80	25	127 mm (5.0")	

TriClamp according to DIN 32676

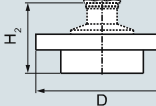
	Order code	DN	PN	ØD	H ₂
	N14	50	16	64 mm (2.5")	Approx. 52 mm (2")
	N15	65	16	91 mm (3.6")	
	N22	2"	16	64 mm (2.5")	Approx. 52 mm (2")
	N23	3"	10	91 mm (3.6")	

Other connections

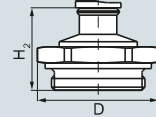
Varivent connection

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

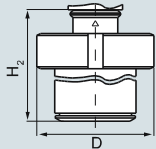
Sanitary process connection according to DRD

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

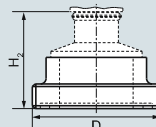
Threaded connection G¾", G1" and G2" acc. to DIN 3852

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

Tank connection TG 52/50 and TG52/150

	Order code	DN	PN	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	

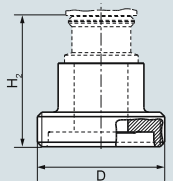
Pressure Measurement

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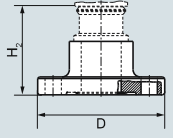
for gauge and absolute pressure, flush-mounted diaphragm

1

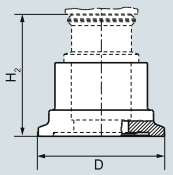
Aseptic threaded socket according to DIN 11864-1 Form A

	Order code	DN	PN	∅D	H ₂
	N33	50	25	78 x 1/6"	Approx. 52 mm (2.1")
N34	65	25	95 x 1/6"		
N35	80	25	110 x 1/4"		
N36	100	25	130 x 1/4"		

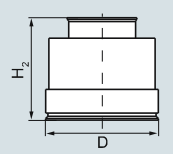
Aseptic flange with notch to DIN 11864-2 Form A

	Order code	DN	PN	∅D	H ₂
	N43	50	16	94 (3.7")	Approx. 52 mm (2.1")
N44	65	16	113 (4.4")		
N45	80	16	133 (5.2")		
N46	100	16	159 (6.3")		

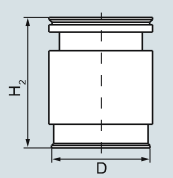
Aseptic clamp with groove according to DIN 11864-3 Form A

	Order code	DN	PN	∅D	H ₂
	N53	50	25	77.5 (3.1")	Approx. 52 mm (2.1")
N54	65	25	91 (3.6")		
N55	80	16	106 (4.2")		
N56	100	16	130 (5.1")		

Process connection PMC Style Standard

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

Process connection PMC Style Minibolt

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

Technical specifications**SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)****Input**

Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar a	4 bar a	6 bar a
	0.83 ... 25 kPa a	0.4 MPa a	0.6 MPa a
	3.3 ... 100.5 inH ₂ O a	58 psi a	87 psi a
	43 ... 1300 mbar a	6.6 bar a	10 bar a
	4.3 ... 130 kPa a	0.66 MPa a	1 MPa a
	17.3 ... 522 inH ₂ O 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 a	380 bar a
	0.53 ... 16 MPa a	24 MPa a	38 MPa a
	77 ... 2321 psi a	3481 psi a	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	0 mbar a/kPa a/psi a		
• Low measuring limit	For temperature of medium $-20\text{ °C} < \vartheta \leq +60\text{ °C}$ ($-4\text{ °F} < \vartheta \leq +140\text{ °F}$)		
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert oil	For temperature of medium $60\text{ °C} < \vartheta \leq +100\text{ °C}$ (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 mbar a + 20 mbar a · ($\vartheta - 60\text{ °C}$)/ $^{\circ}\text{C}$		
	3 kPa a + 2 kPa a · ($\vartheta - 60\text{ °C}$)/ $^{\circ}\text{C}$		
	0.44 psi a + 0.29 psi a · ($\vartheta - 140\text{ °F}$)/ $^{\circ}\text{F}$		
• 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/temperature of medium)		
• Lower range value	Between the measuring limits (infinitely adjustable)		

Output

Output signal	HART
• Low saturation limit (infinitely adjustable)	4 ... 20 mA
• High saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA
• Ripple (without HART communication)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA
Adjustable damping	$I_{pp} \leq 0.5\%$ of max. output current
• Current transmitter	0 ... 100 s, continuously adjustable over remote operation
• Failure signal	0 ... 100 s, in increments of 0.1 s, adjustable over display
Load	3.55 ... 22.8 mA
• Without HART communication	3.55 ... 22.8 mA (factory preset to 3.55 mA)
• 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	-

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Measuring accuracy

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, Turn-Down)

- 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

Operating 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

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	
<ul style="list-style-type: none"> • Wetted parts materials <ul style="list-style-type: none"> - Process connection - Oval flange - Seal diaphragm • Non-wetted parts materials <ul style="list-style-type: none"> - Electronics enclosure - Mounting bracket 	<p>Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602</p> <p>Stainless steel, mat. no. 1.4404/316L</p> <p>Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819</p> <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 <ul style="list-style-type: none"> Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel type plate (1.4404/316L) <p>Electrogalvanized steel or stainless steel</p>
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	<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	
<ul style="list-style-type: none"> • WRAS (England) • ACS (France) • NSF (USA) 	<p>No.: 1903094 (option E83)</p> <p>No.: 18 ACC LY 277 (option E85)</p> <p>No.: 20180920-MH61350 (option E84)</p>
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	
<ul style="list-style-type: none"> • Intrinsic safety "i" <ul style="list-style-type: none"> - Marking - Permissible ambient temperature - Permissible temperature of measuring medium - Connection - Effective internal inductance/capacitance 	<p>II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb</p> <p>-40 ... +80 °C (-40 ... +176 °F) temperature class T4</p> <p>-40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>-40 ... +100 °C (-40 ... +212 °F) temperature class T4</p> <p>-40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>To certified intrinsically safe circuits with peak values:</p> <p>$U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$</p> <p>$U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$</p> <p>$L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$</p>
<ul style="list-style-type: none"> • Flameproof enclosure "d" <ul style="list-style-type: none"> - Marking - Permissible ambient temperature - Permissible temperature of measuring medium - Connection 	<p>Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb</p> <p>-40 ... +80 °C (-40 ... +176 °F) temperature class T4</p> <p>-40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>-40 ... +100 °C (-40 ... +212 °F) temperature class T4</p> <p>-40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>To a circuit with the operating values:</p> <p>$U_n = 10.5 \text{ to } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$</p>

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<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 temperature of measuring medium - "ec" 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) 	<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 -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 -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °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 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 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>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

Selection and ordering data

	Article No.
Pressure transmitters for absolute pressure (pressure series)	
SITRANS P320	➤ 7MF032 - - - - -
SITRANS P420	➤ 7MF042 - - - - -
➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	0
Measuring cell filling	
Silicone oil	1
Inert filling liquid	3
Maximum measuring span	
250 mbar a (100.5 inH ₂ O a)	F
1 300 mbar a (522 inH ₂ O a)	L
5000 mbar a (72.5 psi a)	P
30 bar a (435 psi a)	R
160 bar a (2 321 psi a)	V
400 bar a (5 802 psi a)	W
700 bar a (10 153 psi a)	X
Process connection	
Male thread M20 x 1.5	B
Male thread G½ (DIN EN 837-1)	D
Female thread ½-14 NPT	E
Male thread ½-14 NPT	F
Oval flange, mounting thread: 7/16-20 UNF (IEC 61518)	G
Oval flange, mounting thread: M10 (DIN 19213)	H
Oval flange, mounting thread: M12 (DIN 19213)	J
Version for diaphragm seal pressure	U
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404	0
Stainless steel 316L/1.4404, alloy C276/2.4819	1
Alloy C22/2.4602, alloy C276/2.4819	2
Non-wetted parts materials	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
Enclosure	
Dual chamber device	5
Type of protection	
Without Ex	A
Intrinsic safety	B
Flameproof enclosure	C
Flameproof enclosure, intrinsic safety	D
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	L
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	M
Combination of options B, C and L (zone model)	S
Combination of options B, C and M (zone model, Class Division)	T
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	F
• 2 x ½-14 NPT	M
Local operation/display	
Without display (cover closed)	0
With display (cover closed)	1
With display (cover with glass pane)	2

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

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

Pressure Measurement

Pressure transmitters
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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
Flange connections with flange EN 1092-1	
With flange adapter G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J80
• DN 50 PN 40, stainless steel 1.4571/316Ti	J81
• DN 80 PN 40, stainless steel 1.4571/316Ti	J82
With siphon G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J83
• DN 50 PN 40, stainless steel 1.4571/316Ti	J84
• DN 80 PN 40, stainless steel 1.4571/316Ti	J85
• DN 25 PN 100, stainless steel 1.4571/316Ti	J86
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
Seal (EN 837-1) material Fe (soft iron)	K60
Seal (EN 837-1) material 1.4571	K61
Seal (EN 837-1) material Cu	K62
Process connection	
Process connection male thread G½, bore hole 11 mm	K80
Shut-off valves, valve manifolds	
With mounted valve manifold 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in in factory certificate (EN 10204-2.2)	T02
With mounted valve manifold 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	T03
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	T05
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	T06

Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	Y01
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	
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Input field: Free text, max. 32 characters	
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
Input field: Free text, max. 32 characters	
TAG short (device parameters, max. 8 characters)	Y17
Input field: Free text, max. 8 characters	
Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge	Y21
Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	
Local display Scaling with standard units [m ³ /s, l/s, m, inch, ...], example 1 ... 5 m	Y22
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.	
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
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	

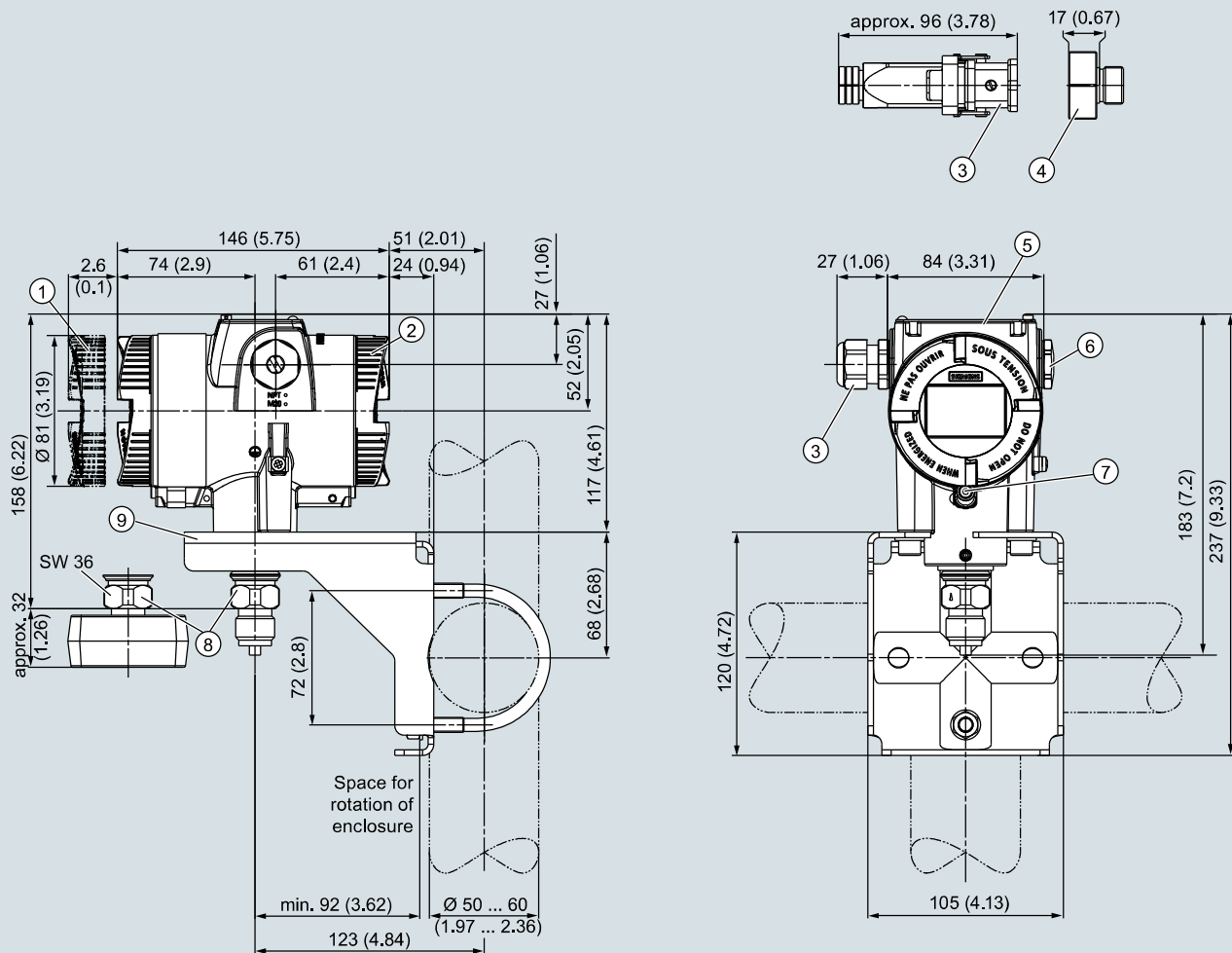
Pressure Measurement

Pressure transmitters
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for absolute pressure (pressure series)

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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 absolute pressure (pressure series), dimensions in mm (inch)

Technical specifications

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

Input			
Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar a	160 bar a	240 bar a
	0.83 ... 25 kPa a	16 MPa a	24 MPa a
	3.3 ... 100.5 inH ₂ O a	2320 psi a	3481 psi a
	43 ... 1300 mbar a	160 bar a	240 bar a
	4.3 ... 130 kPa a	16 MPa a	24 MPa a
	17.3 ... 522 inH ₂ O 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	0 mbar a/kPa a/psi a For temperature of medium $-20\text{ °C} < \vartheta \leq +60\text{ °C}$ ($-4\text{ °F} < \vartheta \leq +140\text{ °F}$) 30 mbar a/3 kPa a/0.44 psi a For temperature of medium $60\text{ °C} < \vartheta \leq +100\text{ °C}$ (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 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		
• Low measuring limit			
- Measuring cell with silicone oil filling			
- Measuring cell with inert liquid			
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output			
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	<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 Lower range value 0 bar/kPa/psi Seal diaphragm stainless steel Measuring cell with silicone oil filling Room temperature 25 °C (77 °F) 		

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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 (all measuring cells) <ul style="list-style-type: none"> - $r \leq 10$ - $10 < r \leq 30$ 	$\leq 0.1\%$ $\leq 0.2\%$
Influence of ambient temperature (in % per 28 °C (50 °F))	
<ul style="list-style-type: none"> 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)	
<ul style="list-style-type: none"> 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
Operating conditions	
Temperature of medium	
<ul style="list-style-type: none"> Measuring cell with silicone oil filling <ul style="list-style-type: none"> - 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	
<ul style="list-style-type: none"> Ambient temperature/enclosure <ul style="list-style-type: none"> - 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 <ul style="list-style-type: none"> - According to IEC 60529 - According to NEMA 250 Electromagnetic compatibility <ul style="list-style-type: none"> - 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	
<ul style="list-style-type: none"> Wetted parts materials <ul style="list-style-type: none"> - Seal diaphragm - Process flanges and sealing plugs - O-ring Non-wetted parts materials <ul style="list-style-type: none"> - Electronics enclosure - 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 <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) Stainless steel ISO 3506-1 A4-70 Steel, electrogalvanized steel, or stainless steel
Process connection	$\frac{1}{4}$ -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: <ul style="list-style-type: none"> M20 x 1.5 $\frac{1}{2}$-14 NPT Device plug Han 7D/Han 8D¹⁾ Device plug M12

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)**Displays and controls**

Keys	4 keys for operation directly on the device
Display	<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	$U_{SS} \leq 0.2$ V (47 ... 125 Hz)
Noise	$U_{eff} \leq 1.2$ mV (0.5 ... 10 kHz)
Auxiliary power	–
Separate supply voltage	–

Certificates and approvals

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

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<ul style="list-style-type: none"> • Type of protection for Zone 2 <ul style="list-style-type: none"> - Marking - Permissible ambient temperature "ec" - Permissible temperature of measuring medium - "ec" 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) <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>1) Han 8D is identical to Han 8U.</p>	<p>Ex II 3G Ex ec 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 ... +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</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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HART communication

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

Selection and ordering data

	Article No.
Pressure transmitters for absolute pressure (differential pressure series)	
SITRANS P320	➤ 7MF033 - - - - -
SITRANS P420	➤ 7MF043 - - - - -
➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	0
Measuring cell filling	
Silicone oil	1
Inert filling liquid	3
Maximum measuring span	
250 mbar a (100.5 inH ₂ O a)	G
1 300 mbar a (522 inH ₂ O a)	L
5000 mbar a (72.5 psi a)	P
30 bar a (435 psi a)	R
100 bar a (1450 psi a)	U
Process connection	
Oval flange, mounting thread: 7/16"-20 UNF (IEC 61518)	Q
Oval flange, mounting thread: M10 (DIN 19213)	R
Oval flange, mounting thread: 7/16"-20 UNF (IEC 61518) with lateral ventilation	S
Oval flange, mounting thread: M10 (DIN 19213) with lateral ventilation	T
Version for diaphragm seal with mounting thread 7/16"-20 UNF (IEC 61518)	V
Version for diaphragm seal with mounting thread M10 (DIN 19213)	W
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	0
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	1
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408	2
Tantalum/tantalum, process flange stainless steel 316/1.4408	4
Monel 00/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408	6
Stainless steel 316L/1.4404, gold-plated, process flange stainless steel 316/1.4408	8
Non-wetted parts materials	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
Enclosure	
Dual chamber device	5
Type of protection	
Without Ex	A
Intrinsic safety	B
Flameproof enclosure	C
Flameproof enclosure, intrinsic safety	D
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	L
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	M
Combination of options B, C and L (zone model)	S
Combination of options B, C and M (zone model, Class Division)	T
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	F
• 2 x 1/2"-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
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	A00
Metal	A01
Stainless steel	A02
Stainless steel 316L/1.4404	A03
CMP, for XP devices	A10
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	A30
Device plug Han 7D (plastic, angled)	A31
Device plug Han 7D (metal, straight)	A32
Device plug Han 7D (metal, angled)	A33
Device plug Han 8D (plastic, straight)	A34
Device plug Han 8D (plastic, angled)	A35
Device plug Han 8D (metal, straight)	A36
Device plug Han 8D (metal, angled)	A37
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	A40
Metal, for device plug Han 7D and Han 8D	A41
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/connector mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91
Cable gland/connector mounted left	A97
Cable gland/connector mounted on right	A99
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13
Italian (bar)	B14
Chinese (bar)	B15
Russian (bar)	B16
English (psi)	B20
English (Pa)	B30
Chinese (Pa)	B35
Certificates	
Quality test certificate, 5-point factory calibration (IEC 60770-2)	C11
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	C13
Factory certificate (EN 10204-2.2) - Wetted parts	C14
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15
Certificates for functional safety	
Functional safety (IEC 61508) - SIL2/3	C20

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

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 factory certificate (EN 10204-2.2)	U01
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U02
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U03
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U04

Pressure Measurement

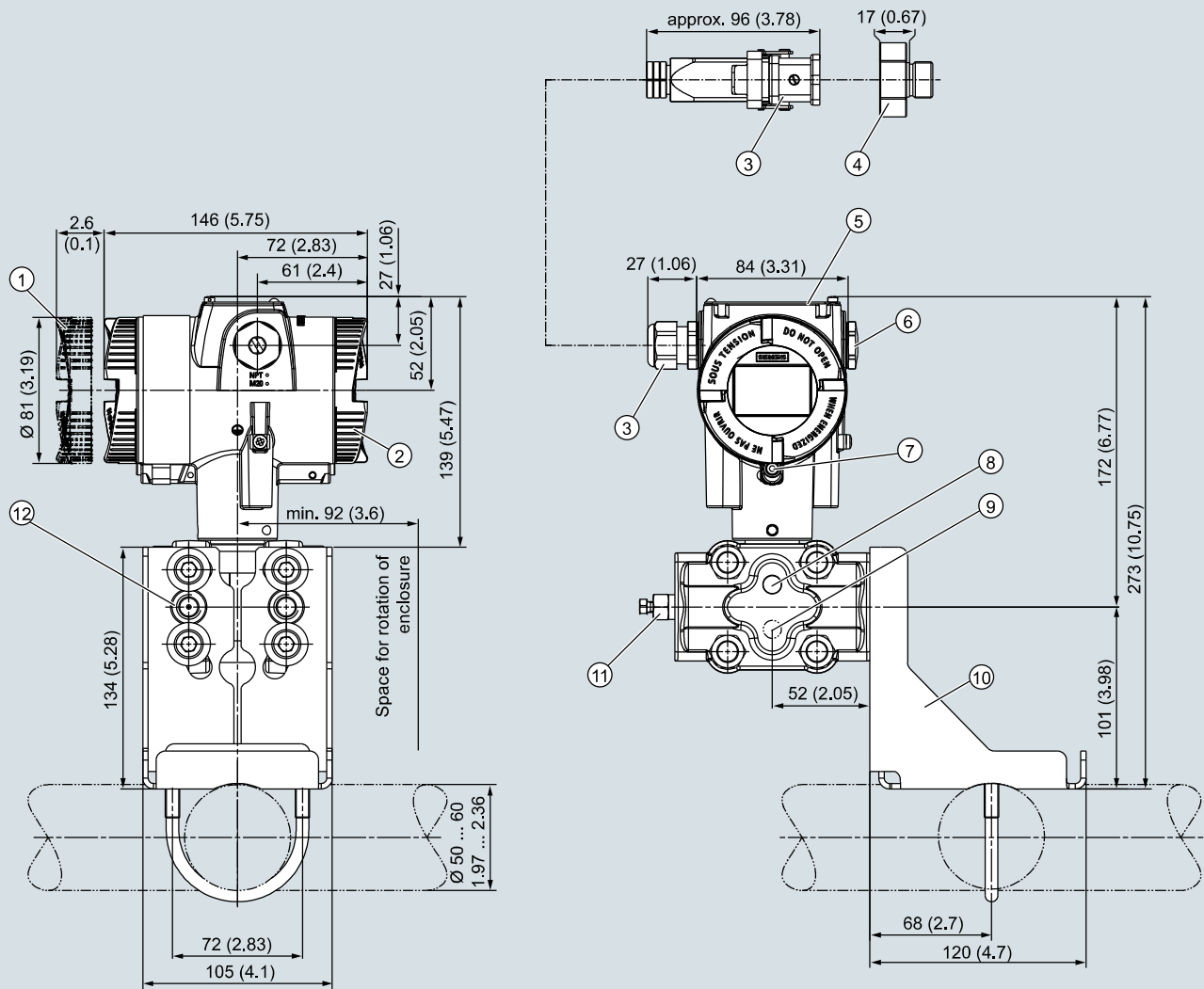
Pressure transmitters
for applications with advanced requirements (Advanced)
SITRANS P320/P420

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.	
Device settings	
Measuring span Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	Y01
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	
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Input field: Free text, max. 32 characters	
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
Input field: Free text, max. 32 characters	
TAG short (device parameters, max. 8 characters)	Y17
Input field: Free text, max. 8 characters	
Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge	Y21
Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	
Local display Scaling with standard units [m ³ /s, l/s, m, inch, ...], example 1 ... 5 m	Y22
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.	
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
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



- | | |
|---|---|
| <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 8D²⁾³⁾ device plug • M12 device plug²⁾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)

Pressure Measurement

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

for differential pressure and flow

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Technical specifications

SITRANS P320 / SITRANS P420 for differential pressure and flow

Input

Measured variable	Differential pressure and flow		
Measuring span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	1 ... 20 mbar	160 bar	240 bar
	0.1 ... 2 kPa	16 MPa	24 MPa
	0.4019 ... 8.037 inH 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 temperature of medium -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)		-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a
	For temperature of medium 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar with PN 420) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))		-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a
			30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C 3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C 0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F
- Measuring cell with FDA-compliant oil		For temperature of medium -10 °C < ϑ ≤ +100 °C (-14 °F < ϑ ≤ +212 °F)	-100% of maximum measuring range or 100 mbar a /10 kPa a /14.5 psi a
• Upper measuring limit		100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/temperature of medium)	
• Lower range value		Between the measuring limits (infinitely adjustable)	

SITRANS P320 / SITRANS P420 for differential pressure and flow

Output	HART
Output signal	4 ... 20 mA
<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 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 • With 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)
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 • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	r = maximum measuring span/set measuring span or nominal measuring range
<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 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	$r \leq 5$: $\leq 0.065\%$ (SITRANS P320) $5 < r \leq 100$: $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P320)
- 250 mbar/25 kPa/3.63 psi (PN 160) 600 mbar/60 kPa/8.7 psi 1600 mbar/160 kPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5$: $\leq 0.04\%$ (SITRANS P420) $5 < r \leq 100$: $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P420)
- 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 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	$r \leq 5$: $\leq 0.065\%$ (SITRANS P320) $\leq 0.04\%$ (SITRANS P420)
- 250 mbar/25 kPa/3.63 psi (PN 420)	$5 < r \leq 100$: $\leq (0.004 \cdot r + 0.045)\%$
<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 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	$r \leq 5$: $\leq 0.13\%$ (SITRANS P320) $\leq 0.08\%$ (SITRANS P420)
- 250 mbar/25 kPa/3.63 psi (PN 420)	$5 < r \leq 100$: $\leq (0.008 \cdot r + 0.09)\%$

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

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 lower range value	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)
	$\leq (0.2 \cdot r)\%$ per 70 bar (SITRANS P420)
- 60 mbar/6 kPa/0.87 psi	$\leq (0.1 \cdot r)\%$ per 70 bar
- 250 mbar/25 kPa/3.63 psi	
- 600 mbar/60 kPa/8.7 psi	
- 1600 mbar/160 kPa/23.21 psi	
- 30 bar/3 MPa/435 psi	
- 5 bar/500 kPa/72.5 psi	$\leq (0.15 \cdot r)\%$ per 70 bar
• on the measuring 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

SITRANS P320 / SITRANS P420 for differential pressure and flow**Operating conditions**

Temperature of medium

- Measuring cell with silicone oil filling
 - Measuring cell 30 bar (435 psi) -40 ... +100 °C (-40 ... +212 °F)
- Measuring cell with inert oil
 - Measuring cell with FDA-compliant oil -20 ... +100 °C (-4 ... +212 °F)
- In conjunction with dust explosion protection -40 ... +85 °C (-4 ... +185 °F)

Ambient conditions

- Ambient temperature/enclosure
 - Observe the temperature class in areas subject to explosion hazard.
 - Measuring cell with silicone oil filling -40 ... +85 °C (-40 ... +185 °F)
 - Measuring cell with inert oil -40 ... +85 °C (-40 ... +185 °F)
 - Measuring cell with FDA-compliant oil -10 ... +85 °C (14 ... +185 °F)
 - Display -20 ... +80 °C (-4 ... +176 °F)
- Storage temperature -50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))
- Climatic class in accordance with IEC 60721-3-4 4K4H
- Degree of protection
 - According to IEC 60529 IP66, IP68
 - According to NEMA 250 Type 4X
- Electromagnetic compatibility
 - Emitted interference and interference immunity According to IEC 61326 and NAMUR NE 21

Design

Weight

Approx. 3.9 kg (8.5 lb) with aluminum enclosure
Approx. 5.8 kg (12.7 lb) with stainless steel enclosure

Material

- Wetted parts materials
 - Seal diaphragm
 - Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
 - 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
 - Process flanges and sealing plugs
 - 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)
 - O-ring
 - Stainless steel ISO 3506-1 A4-70
 - Steel, electrogalvanized steel, or stainless steel
- Non-wetted parts materials
 - Electronics enclosure
 - Pressure flange screws
 - Mounting bracket

Process connection

¼-18 NPT female thread and flat connection with 7/16-20 UNF fastening screw thread in accordance with EN 61518 or M10 fastening screw thread in accordance with DIN 19213 (M12 for PN 420 (MWP 6092 psi))

Electrical connection

Screw terminals
Cable entry via the following screwed glands:

- M20 x 1.5
- ½-14 NPT
- Device plug Han 7D/Han 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

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

Auxiliary power

-

Separate supply voltage

-

Pressure Measurement

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

for differential pressure and flow

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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 temperature of measuring medium
- "ec" 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

-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

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

-40 ... +40 °C (-40 ... +104 °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:

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

SITRANS P320 / SITRANS P420 for differential pressure and flow

<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>
<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</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

Pressure Measurement

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

for differential pressure and flow

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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: $\frac{7}{16}$ -20 UNF (IEC 61518)	L
Oval flange, mounting thread: M10 (PN 160) (DIN 19213)	M
Oval flange, mounting thread: $\frac{7}{16}$ -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 $\frac{7}{16}$ -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 $\frac{7}{16}$ -20 UNF (IEC 61518)	X
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	0
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	1
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408	2
Tantalum/tantalum, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	4
Monel 00/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	6
Stainless steel 316L/1.4404, gold-plated, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	8
Non-wetted parts materials	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
Enclosure	
Dual chamber device	5
Type of protection	
Without Ex	A
Intrinsic safety	B
Flameproof enclosure	C
Flameproof enclosure, intrinsic safety	D
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	L
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	M
Combination of options B, C and L (zone model)	S
Combination of options B, C and M (zone model, Class Division)	T
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	F
• 2 x ½-14 NPT	M

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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

Pressure Measurement

Pressure transmitters
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Selection and ordering data

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

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

Pressure Measurement

Pressure transmitters
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for differential pressure and flow

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

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

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

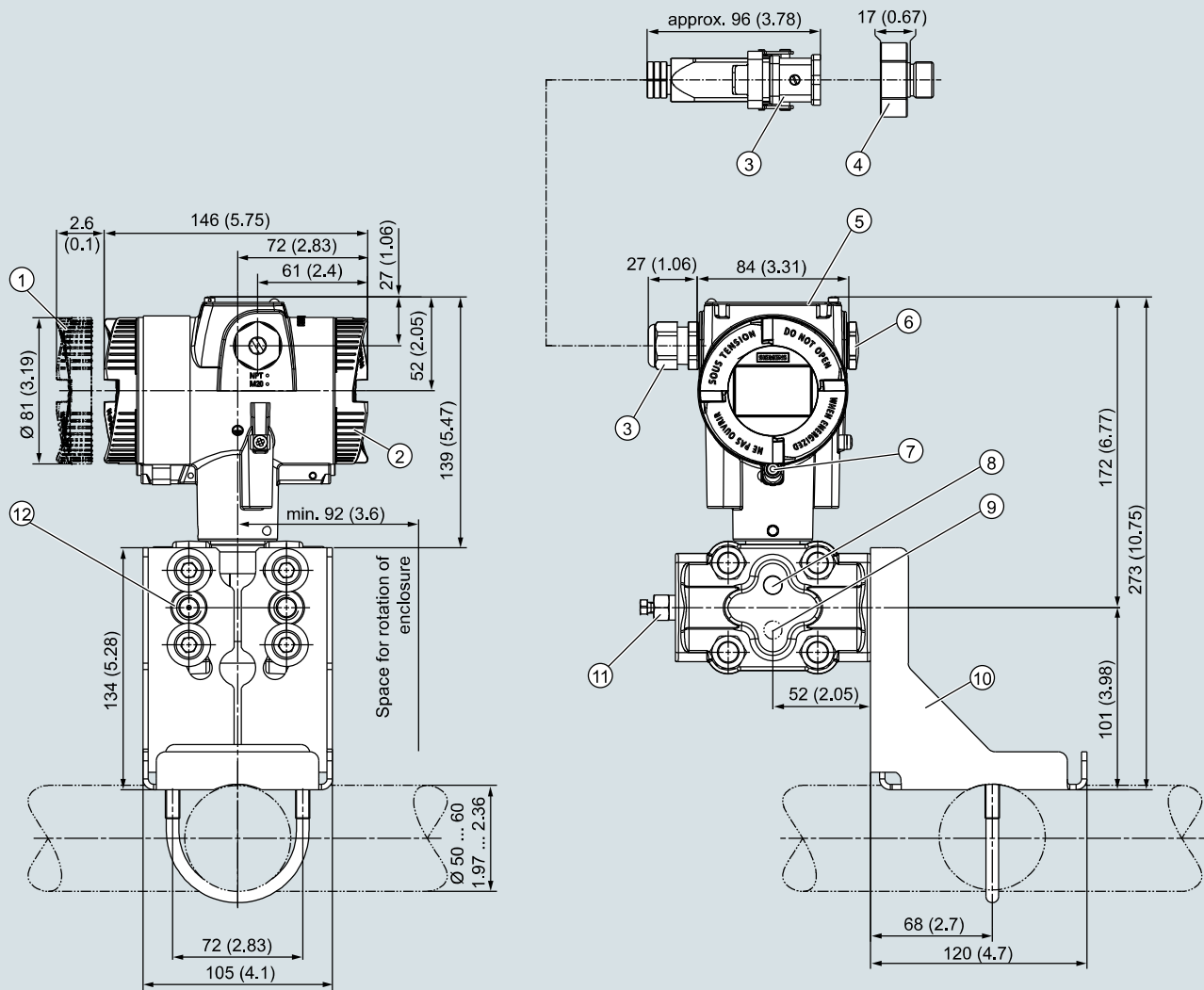
Pressure Measurement

Pressure transmitters
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Dimensional drawings



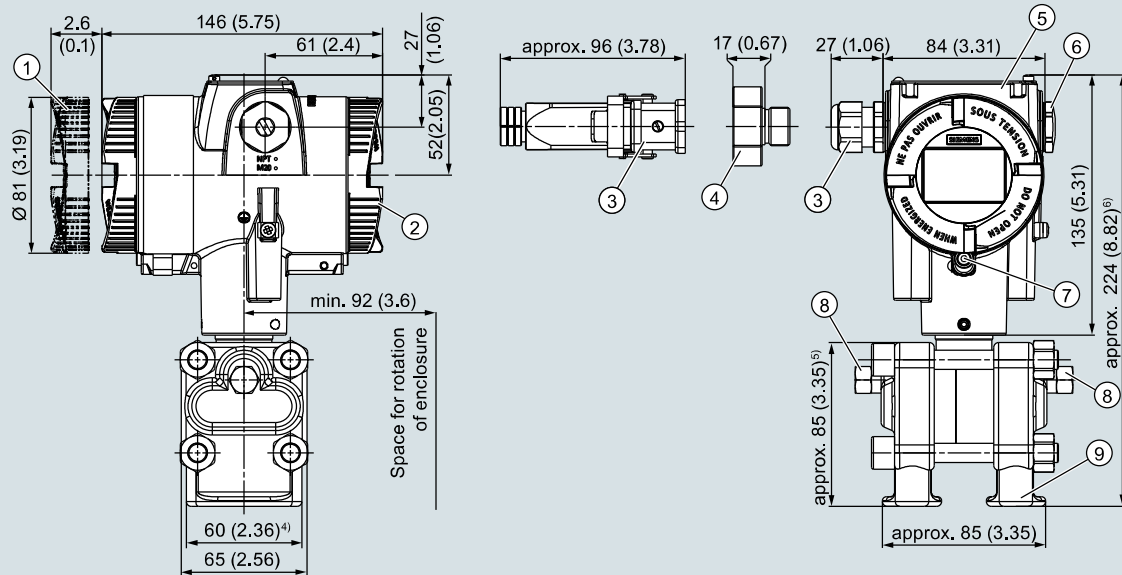
- | | |
|---|---|
| <p>① Electronics side, local display (longer overall length for cover with glass pane)¹⁾</p> <p>② Connection side</p> <p>③ Electrical connection:</p> <ul style="list-style-type: none"> • M20 x 1,5³⁾ screw gland • ½-14 NPT screw gland • Han 7D/Han 8D²⁾³⁾ device plug • M12 device plug²⁾³⁾ <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 differential pressure and flow, dimensions in mm (inch)



- ① Electronics side, local display (longer overall length for cover with inspection window)¹⁾
- ② Connection side
- ③ Electrical connection:
 - M20 x 1,5³⁾ 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)

Pressure Measurement

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for level

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Technical specifications

SITRANS P320 / SITRANS P420 for level

Input

Measured variable

Level

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

Measuring span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

25 ... 250 mbar
2.5 ... 25 kPa
10 ... 100.5 inH₂O
25 ... 600 mbar
2.5 ... 60 kPa
10 ... 241 inH₂O
53 ... 1600 mbar
5.3 ... 160 kPa
21 ... 643 inH₂O
166 ... 5000 mbar
16.6 ... 500 kPa
2.41 ... 72.5 psi

See "Mounting flange"

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
- Lower range value

-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. measuring span
Between the measuring limits (infinitely adjustable)

Output

Output signal

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

Adjustable damping

- Current transmitter
- Failure signal

Load

- Without HART communication
- With HART communication

Characteristic curve

Physical bus

Polarity-independent

HART

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

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

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)

- Linearly increasing or linearly decreasing
- Linear increase or decrease or according to the square root (only for differential pressure and flow)

Measuring accuracy

Reference conditions

- According to EN 60770-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, Turn-Down)

- Linear characteristic
 - 250 mbar/25 kPa/3.6 psi
 - 600 mbar/60 kPa/8.7 psi
 - 1600 mbar/160 kPa/23.21 psi
 - 5 bar/500 kPa/72.5 psi

$r = \text{maximum measuring span/set measuring span or nominal measuring range}$

$r \leq 5$: $\leq 0.125\%$
 $5 < r \leq 10$: $\leq (0.007 \cdot r + 0.09)\%$

SITRANS P320 / SITRANS P420 for level

Influence of ambient temperature in % per 28 °C (50 °F)	
<ul style="list-style-type: none"> • SITRANS P320 <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 • SITRANS P420 <ul style="list-style-type: none"> - 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 	$\leq (0.025 \cdot r + 0.125)\%$ $\leq (0.025 \cdot r + 0.0625)\%$ $\leq (0.125 \cdot r + 0.0625)\%$
Effect of static pressure	
<ul style="list-style-type: none"> • on the lower range value <ul style="list-style-type: none"> - 250 mbar/25 kPa/3.63 psi - 600 mbar/60 kPa/8.70 psi - 1.6 bar/160 kPa/23.21 psi - 5 bar/500 kPa/72.52 psi • on the measuring span 	$\leq (0.3 \cdot r)\%$ per nominal pressure $\leq (0.15 \cdot r)\%$ per nominal pressure $\leq (0.1 \cdot r)\%$ 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
Operating conditions	
Temperature of medium	
Measuring cell with silicone oil filling	<ul style="list-style-type: none"> • High-pressure side: See "Mounting flange" • Low-pressure side: -40 ... +100 °C (-40 ... +212 °F)
Ambient conditions	
<ul style="list-style-type: none"> • Ambient temperature/enclosure <ul style="list-style-type: none"> - Measuring cell with silicone oil filling - Display • Storage temperature • Climatic class in accordance with IEC 60721-3-4 • Degree of protection <ul style="list-style-type: none"> - According to IEC 60529 - According to NEMA 250 • Electromagnetic compatibility <ul style="list-style-type: none"> - 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	
<ul style="list-style-type: none"> • Reference conditions • General operating conditions <ul style="list-style-type: none"> - Oscillations (sine) IEC 60068-2-6 - Continuous shocks (half-sine) IEC 60068-2-27 - Noise (digitally controlled) IEC 60068-2-64 • Operating conditions for marine applications <ul style="list-style-type: none"> - 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 	Specifications apply to devices without mounting bracket 10 ... 58 Hz, 0.3 mm (0.01 inch) 58 ... 500 Hz, 20 m/s ² (65.62 ft/s ²) 1 octave/min 5 cycles/axis 250 m/s ² (820 ft/s ²) 6 ms 2000 shocks/axis 10 ... 200 Hz; 1 (m/s ²)/Hz (3.28 (ft/s ²)/Hz) 200 ... 500 Hz; 0.3 (m/s ²)/Hz (0.98 (ft/s ²)/Hz) 4 hours/axle 2 ... 25 Hz, 1.6 mm (0.06 inch) 25 ... 100 Hz, 40 m/s ² (131.23 ft/s ²) 1 octave/min

Pressure Measurement

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

for level

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SITRANS P320 / SITRANS P420 for level

Design

Weight

- According to EN (pressure transmitter with mounting flange, without tube)
- According to ASME (pressure transmitter with mounting flange, without tube)

Material

- Wetted parts materials

- High-pressure side

Seal diaphragm of mounting flange

Stainless steel, mat. no. 1.4404/316L, Monel 400, mat. no. 2.4360, Alloy B2, mat. no. 2.4617, Alloy C276, mat. no. 2.4819, Alloy C22, mat. no. 2.4602, tantalum, PTFE, PFA, ECTFE

Sealing surface

Smooth according to EN 1092-1, form B1 or ASME B16.5 RF 125 ... 250 AA for stainless steel 316L, EN 2092-1 form B2 or ASME B16.5 RFSF for the remaining materials

- Sealing material in the process flanges

For standard applications

Viton

For underpressure applications on the mounting flange

Copper

- Low-pressure side

Seal diaphragm

Stainless steel, mat. no. 1.4404/316L

Process flanges

Stainless steel, mat. no. 1.4408/316

Process flanges screw

Stainless steel ISO 3506-1 A4-70

O-ring

FPM (Viton)

- Non-wetted parts materials

- Electronics enclosure

- Low-copper die-cast aluminum GD-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

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

Noise

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

Auxiliary power

-

Separate supply voltage

-

SITRANS P320 / SITRANS P420 for 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 temperature of measuring medium
- "ec" 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

-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

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

-40 ... +40 °C (-40 ... +104 °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:

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

Pressure Measurement

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

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for level

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

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	0
Measuring cell filling	
Silicone oil	1
Maximum measuring span	
250 mbar (100.5 inH ₂ O)	G
600 mbar (241 inH ₂ O)	H
1 600 mbar (643 inH ₂ O)	M
5000 mbar (72.5 psi)	P
Process connection	
Version for diaphragm seal with mounting thread 7/16"-20 UNF (IEC 61518): Remote seal 7MF0814 must be ordered separately.	V
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	0
Non-wetted parts materials	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
Enclosure	
Dual chamber device	5
Type of protection	
Without Ex	A
Intrinsic safety	B
Flameproof enclosure	C
Flameproof enclosure, intrinsic safety	D
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	L
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	M
Combination of options B, C and L (zone model)	S
Combination of options B, C and M (zone model, Class Division)	T
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	F
• 2 x 1/2"-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 level

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Selection and ordering data

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

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

Options	Order code
Append "-Z" to Article No., add order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	E80
Dual seal	E81
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	E83
NSF61 (drinking water)	E84
ACS (drinking water)	E85
Device settings	
Measuring span Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	Y01
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	
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Input field: Free text, max. 32 characters	
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
Input field: Free text, max. 32 characters	
TAG short (device parameters, max. 8 characters)	Y17
Input field: Free text, max. 8 characters	
Local display [Pressure, Percent], reference [None, Absolute, Relative], example: Pressure gauge	Y21
Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	
Local display Scaling with standard units [m ³ /s, l/s, m, inch, ...], example 1 ... 5 m	Y22
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.	
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
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	

Pressure Measurement

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

for level

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Selection and Ordering data

Article No.

Order
code

Diaphragm seal

7MF0814 -

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

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

Connecting standard EN 1092-1

Nominal diameter Nominal pressure

Nominal diameter	Nominal pressure	Order code
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

Nominal diameter	Nominal pressure	Order code
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

Nominal diameter	Nominal pressure	Order code
DN 50	10K	2ES
	20k	2ET
	50K	2EU
DN 80	10K	2GS
	20k	2GT
	50K	2GU
DN 100	10K	2HS
	20k	2HT
	50K	2HU
Other version	Add Order code and plain text	9AA

H 1 Y

Selection and Ordering data

Article No.

Order
code

Diaphragm seal

7MF0814 -

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

Filling liquid


Filling liquid	Order code
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
Filling liquid: ...	P 1 Y

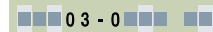
Wetted parts materials

Wetted parts materials	Order code
Stainless steel 316L	A
• Without coating	D
• With PFA coating	E 0
• With PTFE coating	F
• With ECTFE coating	G
Monel 400, 2.4360	J
Hastelloy C276, 2.4819	K
Tantalum	L 0
Titanium, 3.7035	M 0
Nickel 201	Q
Diaphragm Duplex, 1.4462	R
Diaphragm plus flange Duplex, 1.4462	S 0
Stainless steel 316L with gold coating	U 0
Hastelloy C4, 2.4610	V 0
Hastelloy C22, 2.4602	Z 8
Other version	Q 1 Y
Add Order code and plain text	

Extension length

Extension length	Order code
• 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 8
Add Order code and plain text	Q 1 Y

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

Selection and Ordering data		Article No.	Order code
Diaphragm seal		7MF0814 -	
Flange type design, direct connected to a SITRANS P transmitter for level 7MF03../7MF04.. (order separately) Scope of delivery: 1 off			
• 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

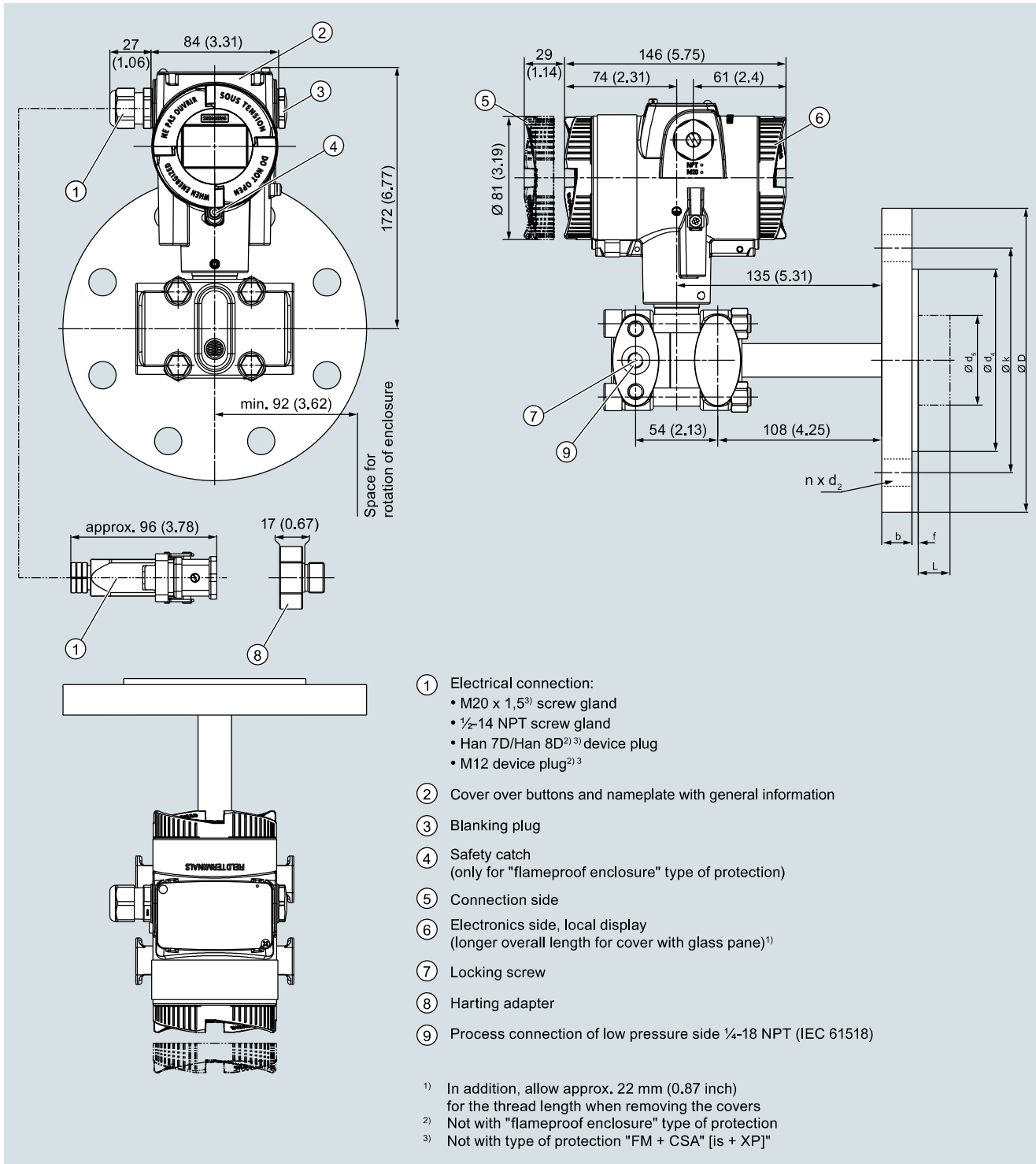
1

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

Selection and Ordering data	Order code
Further designs	
Add "-Z" to Article No. and specify Order code.	
Remote seal connection	
Elongated pipe, 150 mm (5.9 inch) instead of 100 mm (3.9 inch)	S05
Elongated pipe, 200 mm (7.9 inch) instead of 100 mm (3.9 inch)	S06
Customer-specific tube length	
Customer-specific tube length (specify in plain text)	Y44
Specification of process 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 1/337.

Dimensional drawings



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

Pressure Measurement

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

for level

Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d ₂	d ₄	d ₅	d _M with tube	d _M without tube	f	k	n	L
		mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
DN 40	PN 10/16/ 25/40	16	150	18	88	38	30	42	2	110	4	0, 50, 100, 150 or 200
	PN 63/100	24	170	22	88	38	30	42	2	125	4	
	PN 160	26	170	22	88	38	30	42	2	125	4	
DN 50	PN 10/16/ 25/40	18	165	18	102	48.3	40	51	2	125	4	
	PN 63/100	26	195	26	102	48.3	40	51	2	145	4	
	PN 160	28	195	26	102	48.3	40	51	2	145	4	
DN 80	PN 10/16/ 25/40	22	200	18	138	76	65	85	2	160	8	
	PN 100	30	230	26	138	76	65	85	2	180	8	
DN 100	PN 10/16	18	220	18	158	94	85	85	2	180	8	
	PN 25/40	22	235	22	162	94	85	85	2	190	8	
DN 125	PN 16	20	250	18	188	127	85	116	2	210	8	
	PN 40	24	270	26	188	127	85	116	2	220	8	

Connection according to ASME B16.5

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

Process connection according to J.I.S

Nominal diameter	Nominal pressure	b	D	d ₂	d ₄	d ₅	d _M with tube	d _M without tube	f	k	n	L
		mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	mm (inch)	
DN 50	10K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 or 200 (0, 2, 3.94, 5.94 or 7.87)
	20K	16 (0.63)	165 (6.50)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	8	
	40K	26 (1.02)	165 (6.50)	19 (0.75)	105 (4.13)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	130 (5.12)	8	
DN 80	10K	16 (0.63)	185 (7.28)	19 (0.75)	126 (4.96)	76 (2.99)	65 (2.56)	85 (3.35)	2	150 (5.91)	8	
	20K	20 (0.79)	200 (7.87)	23 (0.91)	132 (5.20)	76 (2.99)	65 (2.56)	85 (3.35)	2	160 (6.30)	8	
	40K	32 (1.26)	210 (8.27)	23 (0.91)	140 (5.51)	76 (2.99)	65 (2.56)	85 (3.35)	2	170 (6.30)	8	
DN 100	10K	16 (0.63)	210 (8.27)	19 (0.75)	151 (5.94)	94 (3.7)	85 (3.35)	85 (3.35)	2	175 (6.89)	8	
	20K	22 (0.87)	225 (8.86)	23 (0.91)	160 (6.30)	94 (3.7)	85 (3.35)	85 (3.35)	2	185 (7.28)	8	
	40K	36 (1.42)	250 (9.84)	25 (0.98)	165 (6.50)	94 (3.7)	85 (3.35)	85 (3.35)	2	205 (8.07)	8	

d: Internal diameter of seal according to DIN 2690

d_M: Effective diaphragm diameter

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