

## Pressure Measurement

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

#### Application

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

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

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

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

##### **Pressure transmitter for gauge pressure**

Measured variable:

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

Span (infinitely adjustable)

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

There are two series:

- Gauge pressure series
- Differential pressure series

##### **Pressure transmitters for absolute pressure**

Measured variable:

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

Span (infinitely adjustable)

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

There are two series:

- Gauge pressure series
- Differential pressure series

**Pressure transmitters for differential pressure and flow**

Measured variables:

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

Span (infinitely adjustable)

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

**Pressure transmitters for level**

Measured variable:

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

Span (infinitely adjustable)

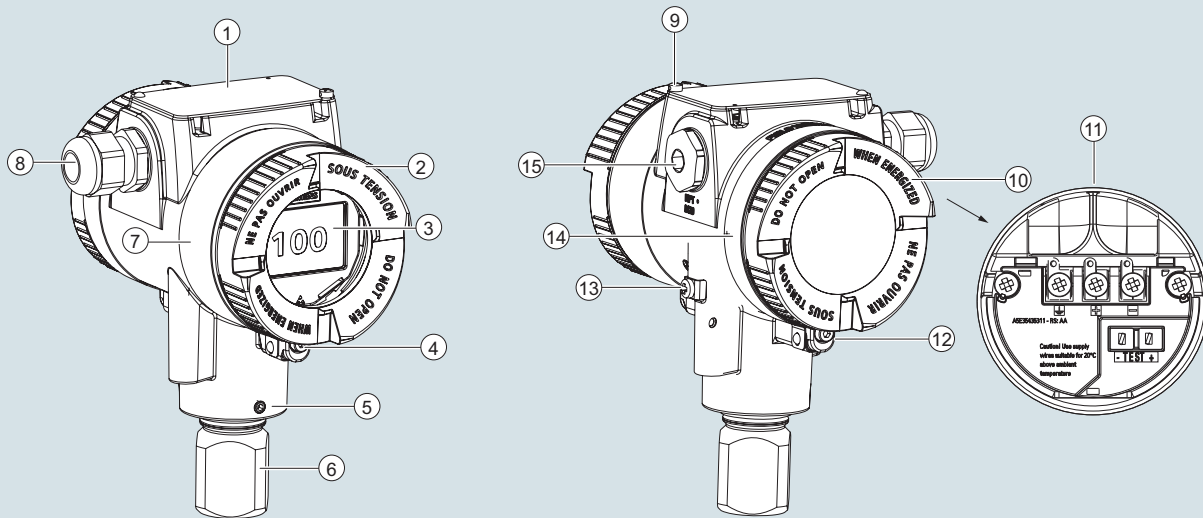
- For SITRANS P320/P420 with HART: 25 mbar to 5 bar (0.363 to 72.5 psi)

Type of the mounting flange:

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

**Design**

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



- ① Cover over buttons and nameplate with general information
- ② Cover (front), optionally with inspection window
- ③ Display (optional)
- ④ Safety catch (front)
- ⑤ Retaining screw for rotation of the enclosure
- ⑥ Process connection
- ⑦ Nameplate with approval information
- ⑧ Cable inlet, optionally with cable gland

- ⑨ 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 housing has a removable circular cover at the front and the back.
- Depending on the device version, the front cover (2) may be designed as an inspection window.
- The cable inlet (8) to the electrical terminal compartment is at the side; either the left or right-hand one can be used. The unused opening is closed with a blanking plug (15).
- The ground terminal (13) is located on the side.

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

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### 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.

**SIEMENS**

SITRANS P320  
Transmitter for pressure  
7MF0440-1ML02-5BF0-Z  
B11+E20  
F.-Nr. XXXXXXXXXX

Vh: DC 10.5 ... 45 V (non IS) 4 ... 20 mA HART  
Mat.: Conec. Diaphr. O-ring Filling  
1.4404 FPM (FKM) Silicone oil

Min./Max. Measuring span : 16 mbar/1600 mbar  
Rated pressure : PN 160

Type of protection IP66  
PED:SEP FW: 00.02.04 HW: 00.00.01

Siemens AG, DE-76181 Karlsruhe  
Made in France

① Article No.  
② Serial number  
③ Materials, connection, diaphragm, O-ring, oil  
④ Minimum/maximum measuring span  
⑤ Nominal pressure  
⑥ Degree of protection  
⑦ Conformity with country-specific directives  
⑧ QR code to mobile website with device-specific information

#### Nameplate with approval information

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

II 1/2 G Ex ia IIC T4/T5/T6 Ga  
II 1/2 G Ex Ib IIC T4/T5/T6 Gb  
Vh: DC 10.5 ... 45 V output: 4 ... 20 mA  
from certified intrinsically safe power source  
VI ≤ 30 V ; II ≤ 100 mA ; PI ≤ 0.75 W  
LI ≤ 0.4 mH ; CI ≤ 6 nF

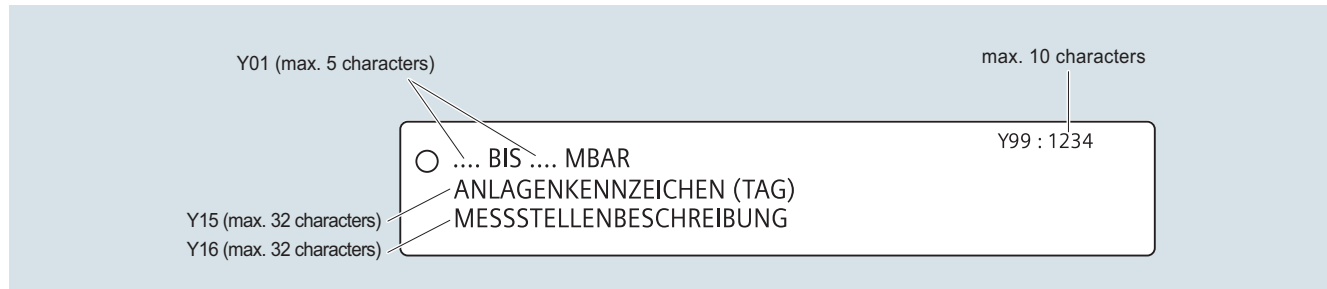
PTB XX ATEX XXXX  
Note test certificate I  
-40°C ≤ Ta ≤ +60°C (T6) / +85°C (T4)

II 1/2 G Ex ia IIC T4/T5/T6 Ga

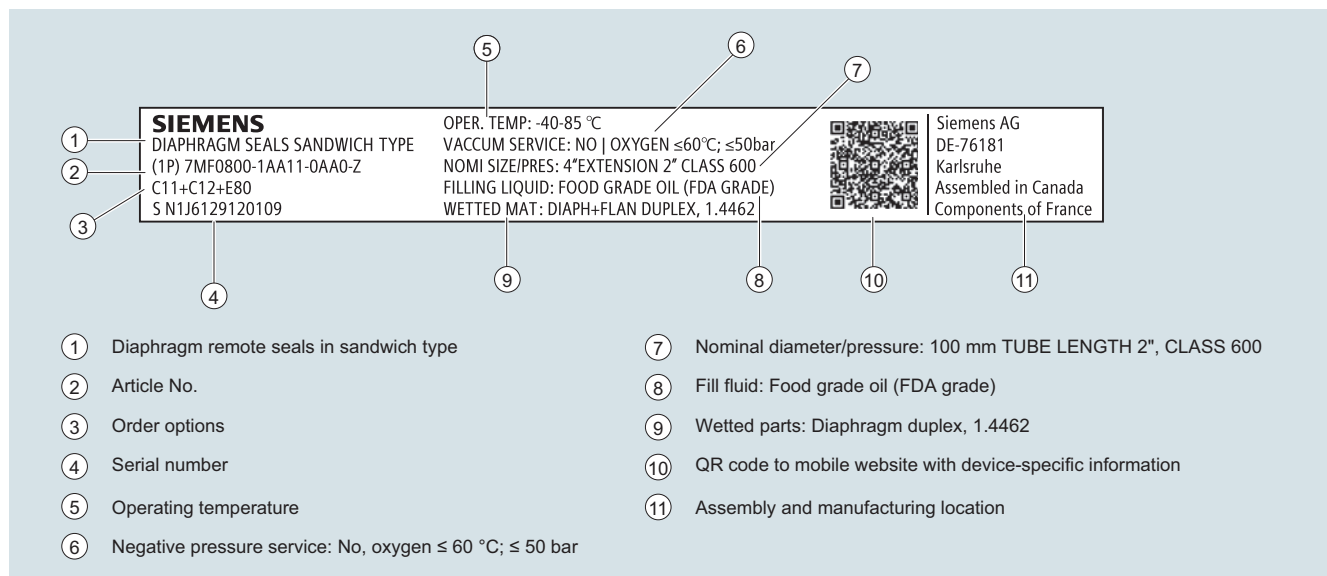
① Characteristics of the hazardous area  
② Type of protection  
③ Group (gas, dust)  
④ Maximum surface temperature (temperature class)  
⑤ Device protection level

Measuring point label

The measuring point label is located under the front cover.

Nameplate with information on the remote seals

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



① Diaphragm remote seals in sandwich type

② Article No.

③ Order options

④ Serial number

⑤ Operating temperature

⑥ Negative pressure service: No, oxygen ≤ 60 °C; ≤ 50 bar

⑦ Nominal diameter/pressure: 100 mm TUBE LENGTH 2", CLASS 600

⑧ Fill fluid: Food grade oil (FDA grade)

⑨ Wetted parts: Diaphragm duplex, 1.4462

⑩ QR code to mobile website with device-specific information

⑪ Assembly and manufacturing location

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### Technical description

#### Function

##### *Adjustable parameters and diagnostics*

SITRANS P320/P420 with HART communication

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

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 <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4 °C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4 °C), mH <sub>2</sub> O (4 °C), mmHg, inHg, atm, torr
Level (height data)	m, cm, mm, ft, in
Volumes (fill level)	m <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI
Volume (flow)	m <sup>3</sup> /sec, m <sup>3</sup> /h, m <sup>3</sup> /d, l/sec, l/min, l/h, Ml/d, ft <sup>3</sup> /sec, ft <sup>3</sup> /h, ft <sup>3</sup> /d, SCF/min, SCF/h, NI/h, Nm <sup>3</sup> /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.

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (pressure series)

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#### Technical specifications

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

###### Input

Measured variable	Gauge pressure	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
Span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086) (for oxygen measurement, max. 100 bar/ 10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/process temperature)	Span		
	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	380 bar
	0.16 ... 16 MPa	24 MPa	38 MPa
	23 ... 2321 psi	3480 psi	5511 psi
	4 ... 400 bar	400 bar	600 bar
	0.4 ... 40 MPa	40 MPa	60 MPa
	58 ... 5802 psi	5802 psi	8702 psi
	7 ... 700 bar	800 bar	800 bar
	0.7 ... 70 MPa	80 MPa	80 MPa
	102 ... 10153 psi	11603 psi	11603 psi

###### Measuring limits

- Low measuring limit

- Measuring cell with silicone oil filling
- Measuring cell with inert oil
- Measuring cell with FDA-compliant oil

- Upper measuring limit

- Start of scale

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.

30 mbar a/3 kPa a/0.44 psi a  
30 mbar a/3 kPa a/0.44 psi a  
100 mbar a/10 kPa a/1.45 psi a

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

Between the measuring limits (infinitely adjustable)

###### 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 [ $\Omega$ ]

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

$U_H$ : 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)

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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
- Start of scale value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

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

- Linear characteristic

- 250 mbar/25 kPa/3.6 psi

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

- 1 bar/100 kPa/3.6 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

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

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

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

$r \leq 3$ :  $\leq 0.075\%$  (SITRANS P320)  
 $3 < r \leq 100$ :  $\leq (0.005 \cdot r + 0.05)\%$  (SITRANS P420)

$r \leq 5$ :  $\leq 0.075\%$  (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/3.6 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  $\pm 30$  °C ( $\pm 54$  °F)

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

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

- 4 bar/400 kPa/58 psi  
16 bar/1.6 MPa/232 psi  
63 bar/6.3 MPa/914 psi  
160 bar/16 MPa/2321 psi  
400 bar/40 MPa/5802 psi
- 700 bar/70 MPa/10152 psi

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

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

Approx. 0.105 s

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

$\leq 0.05$  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

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (pressure series)

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

##### Rated conditions

Temperature of medium

- Measuring cell with silicone oil filling -40 ... +100 °C (-40 ... +212 °F)
- Measuring cell with inert oil
  - 1 bar/100 kPa/3.6 psi -40 ... +85 °C (-40 ... +185 °F)
  - 4 bar/400 kPa/58 psi
  - 16 bar/1.6 MPa/232 psi
  - 63 bar/6.3 MPa/914 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/3.6 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 -20 ... +85 °C (-4 ... +185 °F)
  - Measuring cell with FDA-compliant oil -10 ... +85 °C (14 ... +185 °F)
  - Display -20 ... +80 °C (-4 ... +176 °F)
- Storage temperature -50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))
- Climatic class in accordance with IEC 60721-3-4 4K4H
- Degree of protection
  - According to IEC 60529 IP66, IP68
  - According to NEMA 250 Type 4X
- Electromagnetic compatibility
  - Emitted interference and interference immunity According to IEC 61326 and NAMUR NE 21

##### Design

Weight

Approx. 2.3 kg (5.07 lb) with aluminum enclosure  
Approx. 4.2 kg (9.25 lb) for stainless steel enclosure

Material

- Wetted parts materials
  - Process connection Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602
  - Oval flange Stainless steel, mat. no. 1.4404/316L
  - Seal diaphragm Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
- Non-wetted parts materials
  - Electronics housing
    - Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M
    - Standard: Powder coating with polyurethane
    - Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane
    - Stainless steel type plate (1.4404/316L)
  - Mounting bracket Electroplated 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
  - Han 7D/Han 8D device plug<sup>1)</sup>
  - M12 device plug

##### 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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## for gauge pressure (pressure series)

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

#### Auxiliary power $U_H$

Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mode
Ripple	$U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)
Noise	$U_{\text{eff}} \leq 1.2 \text{ mV}$ (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)	Available soon
• ACS (France)	Available soon
• DVGW (Germany)	Available soon
• NSF (USA)	Available soon
CRN (Canada)	Available soon
Explosion protection acc. to NEPSI (China)	Available soon
Explosion protection acc. to INMETRO (Brazil)	Available soon
BAM (Germany), oxygen expenditures	Available soon
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 101 \text{ mA}$ , $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$ , $I_i = 110 \text{ mA}$ , $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$
- Effective internal inductance/capacitance	
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: $U_n = 10.5 \text{ to } 45 \text{ V}$ , $4 \text{ ... } 20 \text{ mA}$
• Dust explosion protection for Zone 20, 21, 22	
- Marking	Ex II 1D Ex tb IIIC T120 °C Da Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: $U_n = 10.5 \text{ to } 45 \text{ V}$ , $4 \text{ ... } 20 \text{ mA}$
• Dust explosion protection for Zone 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db Ex II 3D Ex ic IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with the peak values: $U_i = 30 \text{ V}$ , $I_i = 101 \text{ mA}$ , $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$ , $I_i = 110 \text{ mA}$ , $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$
- Effective internal inductance/capacitance	

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (pressure series)

1

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

• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc Ex II 3G Ex ic IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible ambient temperature "ic"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +80 °C (-40 ... +176 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: $U_n = 10.5$ to $30$ V, $4$ ... $20$ mA
- "ic" 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
• Explosion protection acc. to FM	Effective internal inductance/capacitance: $L_i = 0.24$ $\mu$ H/ $C_i = 3.29$ nF Available soon
- Marking (XP/DIP) or IS; NI; S	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
• Explosion protection according to CSA	Available soon
- Marking (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

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

**HART communication**

HART	230 ... 1100 $\Omega$
Protocol	HART 7
Software for computer	SIMATIC PDM

# Pressure Measurement

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

1

## for gauge pressure (pressure series)

### Selection and ordering data

	Article No.
<b>Pressure transmitters for gauge pressure (pressure series)</b>	
<b>SITRANS P320</b>	↗ 7MF030 - - - - -
<b>SITRANS P420</b>	↗ 7MF040 - - - - -
↗ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
<b>Communication</b>	
HART, 4 ... 20 mA	0
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
Neobee oil	4
<b>Maximum measuring span</b>	
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
<b>Process connection</b>	
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
<b>Wetted parts materials: Process connection, seal diaphragm</b>	
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
<b>Non-wetted parts materials</b>	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
<b>Enclosure</b>	
Dual chamber device	5
<b>Type of protection</b>	
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
<b>Electrical connections/cable entries</b>	
Thread for cable gland	
• 2 x M20 x 1.5	F
• 2 x ½-14 NPT	M
<b>Local operation/display</b>	
Without display (cover closed)	0
With display (cover closed)	1
With display (cover with glass pane)	2

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (pressure series)

1

**Selection and ordering data**

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

<i>Options</i>	Order code
<b>Device options</b>	
PDF file with device settings	<b>D10</b>
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	<b>D20</b>
FVMQ enclosure sealing	<b>D21</b>
IP66/IP68 degree of protection (not for M12 and Han device plugs)	<b>D30</b>
TAG label empty	<b>D40</b>
Without labeling of the measuring range on the TAG label	<b>D41</b>
Stainless steel Ex plate 1.4404/316L	<b>D42</b>
Increase of pressure stage from PN 420 to PN 500	<b>D50</b>
Overvoltage protection up to 6 kV (external)	<b>D71</b>
Adhesive labels on transport packaging (supplied by customer)	<b>D90</b>
<b>General approval without Ex approval</b>	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
CSA	<b>E06</b>
EAC	<b>E07</b>
FM	<b>E08</b>
KCC	<b>E09</b>
UL	<b>E10</b>
<b>Explosion protection approvals</b>	
ATEX (Europe)	<b>E20</b>
CSA (USA and Canada)	<b>E21</b>
FM (USA and Canada)	<b>E22</b>
IECEX (Worldwide)	<b>E23</b>
EACEx (GOST-R, -K, -B)	<b>E24</b>
INMETRO (Brazil)	<b>E25</b>
KCs (Korea)	<b>E26</b>
NEPSI (China)	<b>E27</b>
PESO (India)	<b>E28</b>
TIIS Hazardous (Japan)	<b>E29</b>
UKR Sepro (Ukraine)	<b>E30</b>
ATEX (Europe) and IECEX (Worldwide)	<b>E47</b>
CSA (Canada) and FM (USA)	<b>E48</b>
ATEX (Europe) and IECEX (Worldwide) + CSA (Canada) and FM (USA)	<b>E49</b>
<b>Marine approvals</b>	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
LR (Lloyds Register)	<b>E51</b>
BV (Bureau Veritas)	<b>E52</b>
ABS (American Bureau of Shipping)	<b>E53</b>
KR (Korean Register of Shipping)	<b>E56</b>
RINA (Registro Italiano Navale)	<b>E57</b>
CCS (China Classification Society)	<b>E58</b>
<b>Country-specific approvals</b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>
<b>Special approvals</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
Dual seal	<b>E81</b>
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	<b>E83</b>
NSF61 (drinking water)	<b>E84</b>
ACS (drinking water)	<b>E85</b>

## Pressure Measurement

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

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### for gauge pressure (pressure series)

Options	Order code
<b>Mounting bracket</b>	
Steel, galvanized	<b>H01</b>
Stainless steel 1.4301/304	<b>H02</b>
Stainless steel 1.4404/316L	<b>H03</b>
<b>Flange connections with flange EN 1092-1</b>	
With flange adapter G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J80</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J81</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J82</b>
With siphon G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J83</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J84</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J85</b>
• DN 25 PN 100, stainless steel 1.4571/316Ti	<b>J86</b>
<b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>	
Seal (EN 837-1) material Fe (soft iron)	<b>K60</b>
Seal (EN 837-1) material 1.4571	<b>K61</b>
Seal (EN 837-1) material Cu	<b>K62</b>
<b>Process connection</b>	
Process connection male thread G½, bore hole 11 mm	<b>K80</b>
<b>Shut-off valves, pneumatic blocks</b>	
With mounted pneumatic block 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in test report (EN 10204-2.2)	<b>T02</b>
With mounted pneumatic block 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in test report (EN 10204-2.2)	<b>T03</b>
With mounted pneumatic block 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in test report (EN 10204-2.2)	<b>T05</b>
With mounted pneumatic block 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in test report (EN 10204-2.2)	<b>T06</b>

### Selection and ordering data

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

# Pressure Measurement

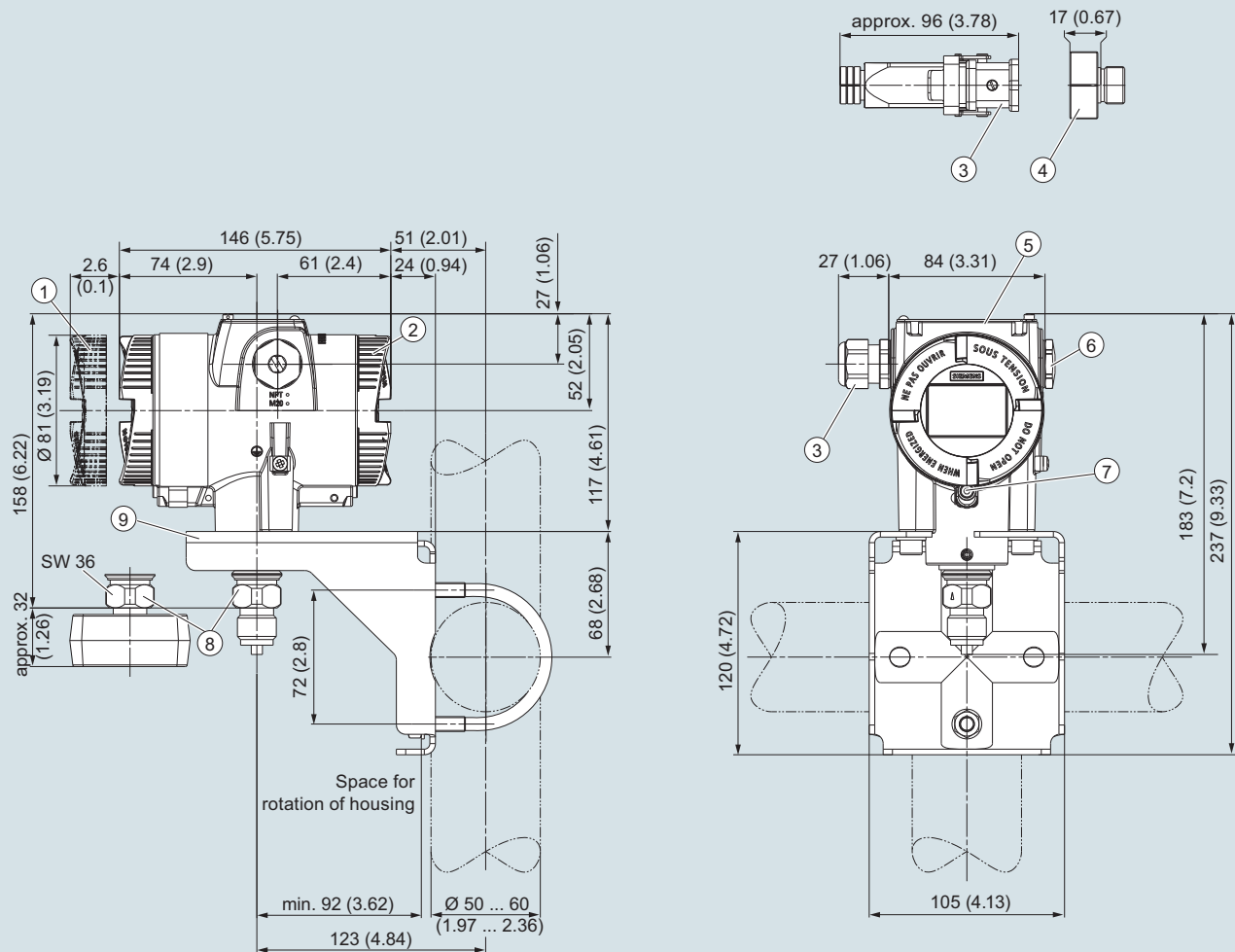
## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (pressure series)

1

## Dimensional drawings



① Electronic side, display (longer overall length for cover with window)<sup>1)</sup>

② Terminal side

③ Electrical connection: screw gland M20 x 1,5<sup>3)</sup> or screw gland ½-14 NPT or Han 7D/Han 8D<sup>2) 3)</sup> device plug or M12 device plug<sup>2) 3)</sup>

④ Harting adapter

⑤ Cover over buttons and nameplate with general information

⑥ Blanking plug

⑦ Screw cover - safety bracket

(only for type of protection "Explosion-proof enclosure")

⑧ Process connection: connection shank G½B or oval flange

⑨ Mounting bracket (option)

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"

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

## Pressure Measurement

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

for gauge pressure (differential pressure series)

1

### Technical specifications

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

##### Input

Measured variable	Gauge pressure	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
Span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Span		
	1 ... 20 mbar	160 bar	160 bar
	0.1 ... 2 kPa	16 MPa	16 MPa
	0.4019 ... 8.037 inH <sub>2</sub> O	2320 psi	2320 psi
	1 ... 60 mbar	160 bar	160 bar
	0.1 ... 6 kPa	16 MPa	16 MPa
	0.4019 ... 24.11 inH <sub>2</sub> O	2320 psi	2320 psi
	2.5 ... 250 mbar	160 bar	160 bar
	0.2 ... 25 kPa	16 MPa	16 MPa
	1.005 ... 100.5 inH <sub>2</sub> O	2320 psi	2320 psi
	6 ... 600 mbar	160 bar	160 bar
	0.6 ... 60 kPa	16 MPa	16 MPa
	2.41 ... 241.1 inH <sub>2</sub> O	2320 psi	2320 psi
	16 ... 1600 mbar	160 bar	160 bar
	1.6 ... 160 kPa	16 MPa	16 MPa
	6.43 ... 643 inH <sub>2</sub> O	2320 psi	2320 psi
	50 ... 5000 mbar	160 bar	160 bar
	5 ... 500 kPa	16 MPa	16 MPa
20.09 ... 2009 inH <sub>2</sub> O	2320 psi	2320 psi	
0.3 ... 30 bar	160 bar	160 bar	
0.03 ... 3 MPa	16 MPa	16 MPa	
4.35 ... 435 psi	2320 psi	2320 psi	
Measuring limits			
• Low measuring limit			
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert oil	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with FDA-compliant oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/process temperature)		
• Start of scale	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
• With HART communication	Resistor R [ $\Omega$ ]
Characteristic curve	$R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$ , $U_H$ : Power supply in V
Physical bus	$R = 230 \dots 1100 \Omega$ (HART communicator (handheld))
Polarity-independent	$R = 230 \dots 500 \Omega$ (SIMATIC PDM)
	• Linearly increasing or linearly decreasing
	• Linear increase or decrease or according to the square root (only for differential pressure and flow)

# Pressure Measurement

## 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)

##### Measuring accuracy

Reference conditions

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

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

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

- Linear characteristic

- 20 mbar/2 kPa/8.031 inH<sub>2</sub>O

$r \leq 5:$   $\leq 0.075\%$   
 $5 < r \leq 20:$   $\leq (0.005 \cdot r + 0.05)\%$

- 60 mbar/6 kPa/24.09 inH<sub>2</sub>O

$r \leq 5:$   $\leq 0.075\%$   
 $5 < r \leq 60:$   $\leq (0.005 \cdot r + 0.05)\%$

- 250 mbar/25 kPa/3.6 psi  
 600 mbar/60 kPa/240.9 inH<sub>2</sub>O  
 1600 mbar/160 kPa/642.4 inH<sub>2</sub>O  
 5000 mbar/500 kPa/2008 inH<sub>2</sub>O  
 30 bar/3 MPa/435 psi

$r \leq 5:$   $\leq 0.065\%$  (SITRANS P320)  
 $\leq 0.04\%$  (SITRANS P420)

$5 < r \leq 100:$   $\leq (0.005 \cdot r + 0.045)\%$  (SITRANS P320)  
 $\leq (0.004 \cdot r + 0.045)\%$  (SITRANS P420)

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

- 20 mbar/2 kPa/8.031 inH<sub>2</sub>O

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

- 60 mbar/6 kPa/24.09 inH<sub>2</sub>O

$\leq (0.075 \cdot r + 0.1)\%$

- 250 mbar/25 kPa/3.6 psi  
 600 mbar/60 kPa/240.9 inH<sub>2</sub>O  
 1600 mbar/160 kPa/642.4 inH<sub>2</sub>O  
 5000 mbar/500 kPa/2008 inH<sub>2</sub>O  
 30 bar/3 MPa/435 psi

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

- 250 mbar/25 kPa/3.6 psi

$\leq (0.025 \cdot r + 0.625)\%$  (SITRANS P420)

- 600 mbar/60 kPa/240.9 inH<sub>2</sub>O

$\leq (0.0125 \cdot r + 0.625)\%$  (SITRANS P420)

- 1600 mbar/160 kPa/642.4 inH<sub>2</sub>O

- 30 bar/3 MPa/435 psi

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

- 20 mbar/2 kPa/8.031 inH<sub>2</sub>O

$\leq (0.2 \cdot r)\%$  per year

- 60 mbar/6 kPa/24.09 inH<sub>2</sub>O

In 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 inH<sub>2</sub>O

In 10 years  $\leq (0.15 \cdot r)\%$

- 1600 mbar/160 kPa/642.4 inH<sub>2</sub>O

- 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)

Approx. 0.1 s

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

$\leq 0.07$  mbar/0.007 kPa/0.01015266 psi per 10° incline  
 (zero-point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

##### Rated conditions

Temperature of medium

- Measuring cell with silicone oil filling
  - Measuring cell 30 bar (435 psi), PN 420
- Measuring cell with inert oil
  - Measuring cell 30 bar (435 psi), PN 420
- Measuring cell with FDA-compliant oil
- In conjunction with dust explosion protection

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +85 °C (-4 ... +185 °F)

-20 ... +100 °C (-4 ... +212 °F)

-20 ... +85 °C (-4 ... +185 °F)

-10 ... +100 °C (14 ... +212 °F)

-40 ... +85 °C (-4 ... +185 °F)

Ambient conditions

- Ambient temperature/enclosure
  - Measuring cell with silicone oil filling
  - Measuring cell with silicone oil filling, measuring cell 30 bar (435 psi), PN 420
  - Measuring cell with inert oil
  - Measuring cell with FDA-compliant oil
  - Display
- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection
  - According to IEC 60529
  - According to NEMA 250
- Electromagnetic compatibility
  - Emitted interference and interference immunity

Observe the temperature class in areas subject to explosion hazard.

-40 ... +85 °C (-40 ... +185 °F)

-20 ... +85 °C (-4 ... +185 °F)

-20 ... +85 °C (-4 ... +185 °F)

-10 ... +85 °C (14 ... +185 °F)

-20 ... +80 °C (-4 ... +176 °F)

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

4K4H

IP66, IP68

Type 4X

According to IEC 61326 and NAMUR NE 21



# Pressure Measurement

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

## for gauge pressure (differential pressure series)

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### 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"> <li>• Wetted parts materials           <ul style="list-style-type: none"> <li>- Seal diaphragm</li> <li>- Process flanges and sealing plugs</li> <li>- O-ring</li> </ul> </li> <li>• Non-wetted parts materials           <ul style="list-style-type: none"> <li>- Electronics housing</li> <li>- Pressure flange screws</li> <li>- Mounting bracket</li> </ul> </li> </ul>	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"> <li>• Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M</li> <li>• Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane</li> <li>• Stainless steel type plate (1.4404/316L)</li> </ul> Stainless steel ISO 3506-1 A4-70 Steel, electrogalvanized steel, or stainless steel
Process connection	½-18 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"> <li>• M20 x 1.5</li> <li>• ½-14 NPT</li> <li>• Han 7D/Han 8D device plug<sup>1)</sup></li> <li>• M12 device plug</li> </ul>

#### Displays and controls

Keys	4 keys for operation directly on the device
Display	<ul style="list-style-type: none"> <li>• With or without integrated display (optional)</li> <li>• Cover with inspection window (optional)</li> </ul>

#### 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"> <li>• WRAS (England)</li> <li>• ACS (France)</li> <li>• DVGW (Germany)</li> <li>• NSF (USA)</li> </ul>	Available soon Available soon Available soon Available soon
CRN (Canada)	Available soon
Explosion protection acc. to NEPSI (China)	Available soon
Explosion protection acc. to INMETRO (Brazil)	Available soon
BAM (Germany), oxygen expenditures	Available soon
Explosion protection	
<ul style="list-style-type: none"> <li>• Intrinsic safety "i"           <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature</li> <li>- Permissible temperature of measuring medium</li> <li>- Connection</li> </ul> </li> <li>- Effective internal inductance/capacitance</li> <li>• Flameproof enclosure "d"           <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature</li> <li>- Permissible temperature of measuring medium</li> <li>- Connection</li> </ul> </li> </ul>	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: $U_n = 10.5 \text{ to } 45 \text{ V}$ , $4 \text{ ... } 20 \text{ mA}$

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (differential pressure series)

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

<ul style="list-style-type: none"> <li>• Dust explosion protection for Zone 20, 21, 22               <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature</li> <li>- Permissible temperature of measuring medium</li> <li>- Max. surface temperature</li> <li>- Connection</li> </ul> </li> <li>• Dust explosion protection for Zone 20, 21, 22               <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature</li> <li>- Permissible temperature of measuring medium</li> <li>- Connection</li> </ul> </li> <li>- Effective internal inductance/capacitance</li> <li>• Type of protection for Zone 2               <ul style="list-style-type: none"> <li>- Marking</li> <li>- Permissible ambient temperature "ec"</li> <li>- Permissible ambient temperature "ic"</li> <li>- Permissible temperature of measuring medium</li> <li>- "ec" connection</li> <li>- "ic" connection</li> </ul> </li> <li>• Explosion protection acc. to FM               <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or IS; NI; S</li> </ul> </li> <li>• Explosion protection according to CSA               <ul style="list-style-type: none"> <li>- Marking (XP/DIP) or (IS)</li> </ul> </li> </ul>	<p>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</p> <p>-40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F) 120 °C (248 °F)</p> <p>To a circuit with the operating values: <math>U_n = 10.5</math> to 45 V, 4 ... 20 mA</p> <p>Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db Ex II 3D Ex ic IIIC T120 °C Dc</p> <p>-40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F)</p> <p>To certified intrinsically safe circuits with the peak values: <math>U_i = 30</math> V, <math>I_i = 101</math> mA, <math>P_i = 760</math> mW <math>U_i = 29</math> V, <math>I_i = 110</math> mA, <math>P_i = 800</math> mW <math>L_i = 0.24</math> μH/<math>C_i = 3.29</math> nF</p> <p>Ex II 3G Ex ec IIC T4/T6 Gc Ex II 3G Ex ic IIC T4/T6 Gc</p> <p>-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6 -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +80 °C (-40 ... +176 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6</p> <p>To a circuit with the operating values: <math>U_n = 10.5</math> to 30 V, 4 ... 20 mA</p> <p>To certified intrinsically safe circuits with the peak values: <math>U_i = 30</math> V, <math>I_i = 101</math> mA, <math>P_i = 760</math> mW <math>U_i = 29</math> V, <math>I_i = 110</math> mA, <math>P_i = 800</math> mW</p> <p>Effective internal inductance/capacitance: <math>L_i = 0.24</math> μH/<math>C_i = 3.29</math> nF</p> <p>Available soon CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III</p> <p>Available soon CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III</p>
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1) Han 8D is identical to Han 8U.

#### HART communication

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

# Pressure Measurement

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

for gauge pressure (differential pressure series)

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## Selection and ordering data

	Article No.
<b>Pressure transmitters for gauge pressure (differential pressure series)</b>	
<b>SITRANS P320</b>	➤ 7MF031 - - - - -
<b>SITRANS P420</b>	➤ 7MF041 - - - - -
➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
<b>Communication</b>	
HART, 4 ... 20 mA	0
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
Neobee oil	4
<b>Maximum measuring span</b>	
20 mbar (8.037 inH <sub>2</sub> O)	B
60 mbar (24.11 inH <sub>2</sub> O)	D
250 mbar (1005 inH <sub>2</sub> O)	G
600 mbar (241.1 inH <sub>2</sub> O)	H
1 600 mbar (643 inH <sub>2</sub> O)	M
5000 mbar (2009 inH <sub>2</sub> O)	P
30 bar (435 psi)	R
<b>Process connection</b>	
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
<b>Wetted parts materials: Process connection, seal diaphragm</b>	
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
Tantalum/tantalum (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 (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 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	8
<b>Non-wetted parts materials</b>	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
<b>Enclosure</b>	
Dual chamber device	5
<b>Type of protection</b>	
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
<b>Electrical connections/cable entries</b>	
Thread for cable gland	
• 2 x M20 x 1.5	F
• 2 x ½-14 NPT	M

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

## Pressure Measurement

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

for gauge pressure (differential pressure series)

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### Selection and ordering data

Options	Order code	Options	Order code
Add "-Z" to article no. and specify order code.			
<b>Cable glands included</b>		<b>Device options</b>	
Plastic	<b>A00</b>	PDF file with device settings	<b>D10</b>
Metal	<b>A01</b>	Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	<b>D20</b>
Stainless steel	<b>A02</b>	FVMQ enclosure sealing	<b>D21</b>
Stainless steel 316L/1.4404	<b>A03</b>	IP66/IP68 degree of protection (not for M12 and Han device plugs)	<b>D30</b>
CMP, for XP devices	<b>A10</b>	TAG label empty	<b>D40</b>
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A11</b>	Without labeling of the measuring range on the TAG label	<b>D41</b>
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A12</b>	Stainless steel Ex plate 1.4404/316L	<b>D42</b>
<b>Han device plug mounted left</b>		Increase of pressure stage from PN 420 to PN 500	<b>D50</b>
Han 7D device plug (plastic, straight)	<b>A30</b>	Overvoltage protection up to 6 kV (external)	<b>D71</b>
Han 7D device plug (plastic, angled)	<b>A31</b>	Adhesive labels on transport packaging (supplied by customer)	<b>D90</b>
Han 7D device plug (metal, straight)	<b>A32</b>		
Han 7D device plug (metal, angled)	<b>A33</b>	<b>General approval without Ex approval</b>	
Han 8D device plug (plastic, straight)	<b>A34</b>	Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Han 8D device plug (plastic, angled)	<b>A35</b>	Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
Han 8D device plug (metal, straight)	<b>A36</b>	CSA	<b>E06</b>
Han 8D device plug (metal, angled)	<b>A37</b>	EAC	<b>E07</b>
<b>Cable socket included</b>		FM	<b>E08</b>
Plastic, for Han 7D/8D device plugs	<b>A40</b>	KCC	<b>E09</b>
Metal, for Han 7D/8D device plugs	<b>A41</b>	UL	<b>E10</b>
<b>M12 device plug mounted left</b>		<b>Explosion protection approvals</b>	
Stainless steel, without cable socket	<b>A62</b>	ATEX (Europe)	<b>E20</b>
Stainless steel, with cable socket	<b>A63</b>	CSA (USA and Canada)	<b>E21</b>
<b>Cable entry/connector mounting</b>		FM (USA and Canada)	<b>E22</b>
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	<b>A90</b>	IECEx (Worldwide)	<b>E23</b>
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	<b>A91</b>	EACEx (GOST-R, -K, -B)	<b>E24</b>
Cable gland/connector mounted left	<b>A97</b>	INMETRO (Brazil)	<b>E25</b>
Cable gland/connector mounted on right	<b>A99</b>	KCs (Korea)	<b>E26</b>
<b>Nameplate labeling</b>		NEPSI (China)	<b>E27</b>
German (bar)	<b>B11</b>	PESO (India)	<b>E28</b>
French (bar)	<b>B12</b>	TIIS Hazardous (Japan)	<b>E29</b>
Spanish (bar)	<b>B13</b>	UKR Sepro (Ukraine)	<b>E30</b>
Italian (bar)	<b>B14</b>	ATEX (Europe) and IECEx (Worldwide)	<b>E47</b>
Chinese (bar)	<b>B15</b>	CSA (Canada) and FM (USA)	<b>E48</b>
Russian (bar)	<b>B16</b>	ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	<b>E49</b>
English (psi)	<b>B20</b>	<b>Marine approvals</b>	
Chinese (Pa)	<b>B35</b>	DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
<b>Certificates</b>		LR (Lloyds Register)	<b>E51</b>
Quality test certificate, 5-point factory calibration (IEC 60770-2)	<b>C11</b>	BV (Bureau Veritas)	<b>E52</b>
Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts	<b>C12</b>	ABS (American Bureau of Shipping)	<b>E53</b>
Test report - NACE (MR 0103-2012 and MR 0175-2009)	<b>C13</b>	KR (Korean Register of Shipping)	<b>E56</b>
Test report (EN 10204-2.2) - Wetted parts	<b>C14</b>	RINA (Registro Italiano Navale)	<b>E57</b>
Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	<b>C15</b>	CCS (China Classification Society)	<b>E58</b>
<b>Certificates for functional safety</b>		<b>Country-specific approvals</b>	
Functional safety (IEC 61508) - SIL2/3	<b>C20</b>	CRN approval Canada (Canadian Registration Number)	<b>E60</b>

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (differential pressure series)

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Options	Order code
<b>Special approvals</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
Dual seal	<b>E81</b>
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	<b>E83</b>
NSF61 (drinking water)	<b>E84</b>
ACS (drinking water)	<b>E85</b>
<b>Mounting bracket</b>	
Steel, galvanized	<b>H01</b>
Stainless steel 1.4301/304	<b>H02</b>
Stainless steel 1.4404/316L	<b>H03</b>
<b>Process flanges; screw plug with vent valve</b>	
Welded in on right	<b>J08</b>
Welded in on left	<b>J09</b>
Glued in on right	<b>J10</b>
Glued in on left	<b>J11</b>
<b>Flange connections with flange EN 1092-1</b>	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J70</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J71</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J72</b>
• DN 15 PN 40, stainless steel 1.4571/316Ti	<b>J78</b>
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J73</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J74</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J75</b>
<b>Flange connection options</b>	
Flange connection and temperature extension	<b>J76</b>
Flange connection with epoxy resin coating	<b>J77</b>
<b>Process flanges; special materials</b>	
Reserved for 7MF7: without process flanges, without screws, without gaskets	<b>K00</b>
Process flange material alloy C4/2.4610	<b>K01</b>
Process flange material Monel 400/2.4360	<b>K02</b>
Process connection material PVDF, on the side ½-14 NPT	<b>K05</b>
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	<b>K06</b>
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	<b>K07</b>
<b>Process flanges; process connection option</b>	
Process flange with process connection G½ welded on	<b>K20</b>
Process connection (oval flange) NAM (ASTAVA)	<b>K21</b>
<b>Process flanges chambered with gaskets</b>	
1x chambered, graphite	<b>K40</b>
1x chambered, PTFE	<b>K41</b>
2x chambered, PTFE	<b>K42</b>
<b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>	
O-ring, process flanges, PTFE	<b>K50</b>
O-ring, process flanges, FEP (with silicone core, approved for food)	<b>K51</b>
O-ring, process flanges, FFKM (FFPM)	<b>K52</b>
O-ring, process flanges, NBR	<b>K53</b>
O-ring, process flanges, EPDM	<b>K54</b>

Options	Order code
<b>Process flange options</b>	
Process flanges for vertical differential pressure lines (half process flange)	<b>K81</b>
Process flanges (+) - side front	<b>K82</b>
Process flange screws, process flange nuts, material Monel 400/2.4360	<b>K83</b>
Valve ¼-18 NPT, material same as process flanges	<b>K84</b>
Valve mounted on the side, measured medium: Gas	<b>K85</b>
Oval flange enclosed, gasket PTFE + mounting screws	<b>K86</b>
<b>Pneumatic blocks</b>	
With mounted pneumatic block (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in test report (EN 10204-2.2)	<b>U01</b>
With mounted pneumatic block (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)	<b>U02</b>
With mounted pneumatic block (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in test report (EN 10204-2.2)	<b>U03</b>
With mounted pneumatic block (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)	<b>U04</b>

## Pressure Measurement

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

for gauge pressure (differential pressure series)

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### Selection and ordering data

<i>Customer-specific device settings</i>	Order code
Add "-Z" to article no., specify order code and plain text or drop-down list selection.	
<b>Measuring span</b> <b>Start of scale value (max. 5 characters),</b> <b>full scale value (max. 5 characters),</b> <b>unit [mbar, bar, kPa, MPa, psi, ...],</b> <b>example: -0.5 ... 10.5 psi</b>  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 <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr	Y01
<b>TAG</b> <b>(on stainless steel plate and device parameters,</b> <b>max. 32 characters)</b>  Input field: Free text, max. 32 characters	Y15
<b>Measuring point description</b> <b>(on stainless steel plate and device parameters,</b> <b>max. 32 characters)</b>  Input field: Free text, max. 32 characters	Y16
<b>TAG short</b> <b>(device parameters, max. 8 characters)</b>  Input field: Free text, max. 8 characters	Y17
<b>Local display</b> <b>[Pressure, Percent], reference [None, Absolute, Rela-</b> <b>tive], example: Pressure gauge</b>  Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	Y21
<b>Local display</b> <b>Scaling with standard units</b> <b>[m<sup>3</sup>/s, l/s, m, inch, ...], example 1 ... 5 m</b>  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 <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI.	Y22
<b>Local display</b> <b>Scaling with user-specific units (max. 12 characters),</b> <b>example 1 ... 5 m</b>  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
<b>Saturation limits instead of 3.8 ... 20.5 mA,</b> <b>example: 3.8 ... 22.0 mA</b>  Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	Y30
<b>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</b>  Drop-down list: 3.75; 21.75; 22.5; 22.6	Y31
<b>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</b>  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
<b>ID number of special version</b>  Input field: max. 4 characters and only natural numbers from 0 ... 9999	Y99

# Pressure Measurement

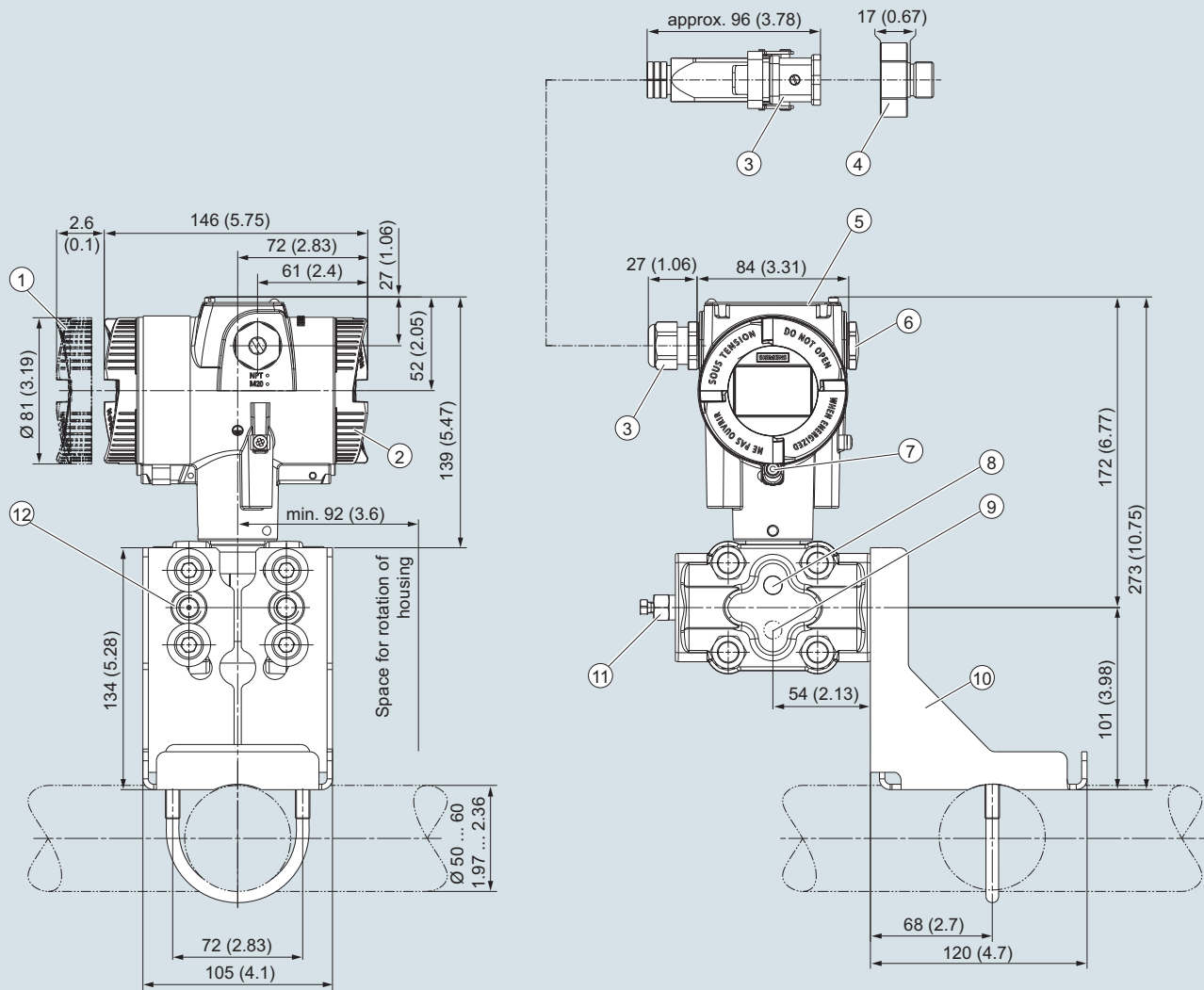
## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge pressure (differential pressure series)

1

## Dimensional drawings



- ① Electronic side, display (longer overall length for cover with window)<sup>1)</sup>
- ② Terminal side
- ③ Electrical connection: screw gland M20 x 1,5<sup>3)</sup> or screw gland ½-14 NPT or Han 7D/Han 8D<sup>2)</sup> device plug or M12 device plug<sup>2)</sup>
- ④ Harting adapter
- ⑤ Cover over buttons and nameplate with general information

- ⑥ Blanking plug
- ⑦ Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure")
- ⑧ Lateral venting for liquid measurement (Standard)
- ⑨ Lateral venting for gas measurement (suffix K85)
- ⑩ Mounting bracket (option)
- ⑪ Sealing screw with valve (option)
- ⑫ Process connection: ¼-18 NPT (IEC 61518)

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"

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



# Pressure Measurement

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

for gauge and absolute pressure, flush-mounted diaphragm

1

## Technical specifications

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

#### Input of gauge pressure, with flush-mounted diaphragm

Measured variable

Gauge pressure

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

Span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange<sup>1)</sup>

0.01 ... 1 bar

1 ... 100 kPa

0.15 ... 14.5 psi

0.04 ... 4 bar

4 ... 400 kPa

0.58 ... 58 psi

0.16 ... 16 bar

0.016 ... 1.6 MPa

2.3 ... 232 psi

0.6 ... 63 bar

0.063 ... 6.3 MPa

9.1 ... 914 psi

Measuring limits

- Low measuring limit

- Measuring cell with silicone oil filling

- Measuring cell with inert oil

- Measuring cell with FDA-compliant oil

- Upper measuring limit

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

100 mbar a/10 kPa a/1.45 psi a

100% of max. span

#### Input of absolute pressure, with flush-mounted diaphragm

Measured variable

Absolute pressure

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

Span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange<sup>1)</sup>

43 ... 1300 mbar a

4.3 ... 130 kPa a

17 ... 525 inH<sub>2</sub>O a

166 ... 5000 mbar a

16.6 ... 500 kPa a

2.41 ... 72.5 psi a

1 ... 30 bar a

0.1 ... 3 MPa a

14.5 ... 435 psi a

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

Measuring limits

- Low measuring limit

- Measuring cell with silicone oil filling

- Upper measuring limit

0 bar a/0 kPa a/0 psi a

100% of max. span

Start of scale

Between the measuring limits (infinitely adjustable)

#### Output

#### HART

Output signal

4 ... 20 mA

- 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 [ $\Omega$ ]

- 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

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

1

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

##### Gauge pressure measuring accuracy, with flush-mounted diaphragm

Reference conditions

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

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

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

- Linear characteristic

- 1 bar/100 kPa/3.6 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/3.6 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi

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

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

- 1 bar/100 kPa/3.6 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 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)

Approx. 0.1 s

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

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

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

##### Absolute pressure measuring accuracy with flush diaphragm

Reference conditions

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

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

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

- Linear characteristic

- All measuring cells

$r \leq 10$ :  $\leq 0.2\%$   
 $10 < r \leq 30$ :  $\leq 0.4\%$

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

- All measuring cells

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

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °F)

- All measuring cells

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

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

Approx. 0.2 s

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

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

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

# Pressure Measurement

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

## for gauge and absolute pressure, flush-mounted diaphragm

1

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

#### Rated conditions

Temperature of medium<sup>2)</sup>

- 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)  
-10 ... +200 °C (14 ... +392 °F) with cooling extension

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)
    - 1 bar/100 kPa/3.6 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 ps
    - 160 bar/16 MPa/2321 psi -20 ... +100 °C (-4 ... +212 °F)
    - 400 bar/40 MPa/5802 psi
    - 700 bar/70 MPa/10152 ps
  - Measuring cell with FDA-compliant oil  
-10 ... +85 °C (14 ... +185 °F)
  - Display  
-20 ... +80 °C (-4 ... +176 °F)
- Storage temperature  
-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))
- Climatic class in accordance with IEC 60721-3-4  
4K4H
- Degree of protection
  - According to IEC 60529  
IP66, IP68
  - According to NEMA 250  
Type 4X
- Electromagnetic compatibility
  - Emitted interference and interference immunity  
According to IEC 61326 and NAMUR NE 21

#### Design

Weight (pressure transmitter without mounting flange)

Material

- Wetted parts materials
  - Process connection  
Stainless steel, mat. no. 1.4404/316L
  - Seal diaphragm  
Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
- Non-wetted parts materials
  - Electronics housing
    - Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/CF-3M
    - Standard: Powder coating with polyurethane  
Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane
    - Stainless steel type plate (1.4404/316L)
  - Mounting bracket  
Steel, electrogalvanized steel, or stainless steel

Process connection

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

Electrical connection

- Cable entry via the following screwed glands:
- M20 x 1.5
  - ½-14 NPT
  - Han 7D/Han 8D device plug<sup>3)</sup>
  - M12 device plug

#### 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<sub>H</sub>

Terminal voltage on pressure transmitter

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

Ripple

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

Noise

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

Auxiliary power

–

Separate supply voltage

–

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

1

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

##### Certificates and approvals

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

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

Drinking water

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

Available soon  
Available soon  
Available soon  
Available soon

CRN (Canada)

Available soon

Explosion protection acc. to NEPSI (China)

Available soon

Explosion protection acc. to INMETRO (Brazil)

Available soon

BAM (Germany), oxygen expenditures

Available soon

Explosion protection

- Intrinsic safety "i"

- Marking

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

- Permissible ambient temperature

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

- Permissible temperature of measuring medium

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

- Connection

To certified intrinsically safe circuits with peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$   
 $U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$   
 $L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$

- Effective internal inductance/capacitance

- Flameproof enclosure "d"

- Marking

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

- Permissible ambient temperature

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

- Permissible temperature of measuring medium

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

- Connection

To a circuit with the operating values:

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

- Dust explosion protection for Zone 20, 21, 22

- Marking

Ex II 1D Ex tb IIIC T120 °C Da  
Ex II 2D Ex tb IIIC T120 °C Db  
Ex II 3D Ex tc IIIC T120 °C Dc

- Permissible ambient temperature

-40 ... +80 °C (-40 ... +176 °F)

- Permissible temperature of measuring medium

-40 ... +100 °C (-40 ... +212 °F)

- Max. surface temperature

120 °C (248 °F)

- Connection

To a circuit with the operating values:

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

- Dust explosion protection for Zone 20, 21, 22

- Marking

Ex II 1D Ex ia IIIC T120 °C Da  
Ex II 2D Ex ib IIIC T120 °C Db  
Ex II 3D Ex ic IIIC T120 °C Dc

- Permissible ambient temperature

-40 ... +80 °C (-40 ... +176 °F)

- Permissible temperature of measuring medium

-40 ... +100 °C (-40 ... +212 °F)

- Connection

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$   
 $U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$   
 $L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$

- Effective internal inductance/capacitance

- Type of protection for Zone 2

- Marking

Ex II 3G Ex ec IIC T4/T6 Gc  
Ex II 3G Ex ic IIC T4/T6 Gc

- Permissible ambient temperature "ec"

-40 ... +80 °C (-40 ... +176 °F) temperature class T4  
-40 ... +40 °C (-40 ... +104 °F) temperature class T6

- Permissible ambient temperature "ic"

-40 ... +80 °C (-40 ... +176 °F) temperature class T4  
-40 ... +80 °C (-40 ... +176 °F) temperature class T6

- Permissible temperature of measuring medium

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

- "ec" connection

To a circuit with the operating values:

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

- "ic" connection

To certified intrinsically safe circuits with the peak values:

$U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$   
 $U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

Effective internal inductance/capacitance:

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

## Pressure Measurement

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

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

- 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 process temperature 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

## 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.
<b>Pressure transmitter for gauge and absolute pressure, with flush-mounted diaphragm</b>	
<b>SITRANS P320 for gauge pressure</b>	➤ 7MF030 - - - - -
<b>SITRANS P420 for gauge pressure</b>	➤ 7MF040 - - - - -
<b>SITRANS P320 for absolute pressure</b>	➤ 7MF032 - - - - -
<b>SITRANS P420 for absolute pressure</b>	➤ 7MF042 - - - - -
➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
<b>Communication</b>	
HART, 4 ... 20 mA	0
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
Neobee oil	4
<b>Maximum measuring span</b>	
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
<b>Process connection</b>	
Flush-mounted diaphragm	K
<b>Wetted parts materials: Process connection, seal diaphragm</b>	
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
<b>Non-wetted parts materials</b>	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
<b>Enclosure</b>	
Dual chamber device	5
<b>Type of protection</b>	
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
<b>Electrical connections/cable entries</b>	
Thread for cable gland	
• 2 x M20 x 1.5	F
• 2 x ½-14 NPT	M
<b>Local operation/display</b>	
Without display (cover closed)	0
With display (cover closed)	1
With display (cover with glass pane)	2

## Pressure Measurement

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

for gauge and absolute pressure, flush-mounted diaphragm

1

### Selection and ordering data

Options	Order code	Options	Order code
Add "-Z" to article no. and specify order code.		<b>Device options</b>	
<b>Cable glands included</b>		PDF file with device settings	<b>D10</b>
Plastic	<b>A00</b>	Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	<b>D20</b>
Metal	<b>A01</b>	FVMQ enclosure sealing	<b>D21</b>
Stainless steel	<b>A02</b>	IP66/IP68 degree of protection (not for M12 and Han device plugs)	<b>D30</b>
Stainless steel 316L/1.4404	<b>A03</b>	TAG label empty	<b>D40</b>
CMP, for XP devices	<b>A10</b>	Without labeling of the measuring range on the TAG label	<b>D41</b>
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A11</b>	Stainless steel Ex plate 1.4404/316L	<b>D42</b>
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A12</b>	Increase of pressure stage from PN 420 to PN 500	<b>D50</b>
<b>Han device plug mounted left</b>		Overvoltage protection up to 6 kV (external)	<b>D71</b>
Han 7D device plug (plastic, straight)	<b>A30</b>	Adhesive labels on transport packaging (supplied by customer)	<b>D90</b>
Han 7D device plug (plastic, angled)	<b>A31</b>		
Han 7D device plug (metal, straight)	<b>A32</b>	<b>General approval without Ex approval</b>	
Han 7D device plug (metal, angled)	<b>A33</b>	Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Han 8D device plug (plastic, straight)	<b>A34</b>	Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
Han 8D device plug (plastic, angled)	<b>A35</b>	CSA	<b>E06</b>
Han 8D device plug (metal, straight)	<b>A36</b>	EAC	<b>E07</b>
Han 8D device plug (metal, angled)	<b>A37</b>	FM	<b>E08</b>
<b>Cable socket included</b>		KCC	<b>E09</b>
Plastic, for Han 7D/8D device plugs	<b>A40</b>	UL	<b>E10</b>
Metal, for Han 7D/8D device plugs	<b>A41</b>	<b>Explosion protection approvals</b>	
<b>M12 device plug mounted left</b>		ATEX (Europe)	<b>E20</b>
Stainless steel, without cable socket	<b>A62</b>	CSA (USA and Canada)	<b>E21</b>
Stainless steel, with cable socket	<b>A63</b>	FM (USA and Canada)	<b>E22</b>
<b>Cable entry/connector mounting</b>		IECEX (Worldwide)	<b>E23</b>
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	<b>A90</b>	EACEX (GOST-R, -K, -B)	<b>E24</b>
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	<b>A91</b>	INMETRO (Brazil)	<b>E25</b>
Cable gland/connector mounted left	<b>A97</b>	KCs (Korea)	<b>E26</b>
Cable gland/connector mounted on right	<b>A99</b>	NEPSI (China)	<b>E27</b>
<b>Nameplate labeling</b>		PESO (India)	<b>E28</b>
German (bar)	<b>B11</b>	TIIS Hazardous (Japan)	<b>E29</b>
French (bar)	<b>B12</b>	UKR Sepro (Ukraine)	<b>E30</b>
Spanish (bar)	<b>B13</b>	ATEX (Europe) and IECEX (Worldwide)	<b>E47</b>
Italian (bar)	<b>B14</b>	CSA (Canada) and FM (USA)	<b>E48</b>
Chinese (bar)	<b>B15</b>	ATEX (Europe) and IECEX (Worldwide) + CSA (Canada) and FM (USA)	<b>E49</b>
Russian (bar)	<b>B16</b>	<b>Marine approvals</b>	
English (psi)	<b>B20</b>	DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
Chinese (Pa)	<b>B35</b>	LR (Lloyds Register)	<b>E51</b>
<b>Certificates</b>		BV (Bureau Veritas)	<b>E52</b>
Quality test certificate, 5-point factory calibration (IEC 60770-2)	<b>C11</b>	ABS (American Bureau of Shipping)	<b>E53</b>
Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts	<b>C12</b>	KR (Korean Register of Shipping)	<b>E56</b>
Test report - NACE (MR 0103-2012 and MR 0175-2009)	<b>C13</b>	RINA (Registro Italiano Navale)	<b>E57</b>
Test report (EN 10204-2.2) - Wetted parts	<b>C14</b>	CCS (China Classification Society)	<b>E58</b>
Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	<b>C15</b>	<b>Country-specific approvals</b>	
<b>Certificates for functional safety</b>		CRN approval Canada (Canadian Registration Number)	<b>E60</b>
Functional safety (IEC 61508) - SIL2/3	<b>C20</b>	<b>Special approvals</b>	
		Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
		Dual seal	<b>E81</b>
		WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	<b>E83</b>
		NSF61 (drinking water)	<b>E84</b>

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

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Options	Order code
ACS (drinking water)	<b>E85</b>
3A (hygiene)	<b>E86</b>
EHEDG (hygiene)	<b>E87</b>
<b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>	
Seal (EN 837-1) material Fe (soft iron)	<b>K60</b>
Seal (EN 837-1) material 1.4571	<b>K61</b>
Seal (EN 837-1) material Cu	<b>K62</b>
<b>Process connection</b>	
Process connection male thread G½, bore hole 11 mm	<b>K80</b>
<b>Flanges according to DIN EN 1092-1 Form B1 and ASME standard B16.5</b>	
EN 1092-1 Form B1	
• DN 50 PN 16	<b>M03</b>
• DN 80 PN 16	<b>M05</b>
• DN 25 PN 40	<b>M10</b>
• DN 40 PN 40	<b>M12</b>
• DN 50 PN 40	<b>M13</b>
• DN 80 PN 40	<b>M15</b>
• DN 40 PN 100	<b>M22</b>
ASME B16.5	
• 1" Class 150 RF	<b>M30</b>
• 1 ½" Class 150 RF	<b>M31</b>
• 2" Class 150 RF	<b>M32</b>
• 3" Class 150 RF	<b>M33</b>
• 4" Class 150 RF	<b>M34</b>
• 1" Class 300 RF	<b>M35</b>
• 1 ½" Class 300 RF	<b>M36</b>
• 2" Class 300 RF	<b>M37</b>
• 3" Class 300 RF	<b>M38</b>
• 4" Class 300 RF	<b>M39</b>
<b>Sanitary connections in accordance with the standard</b>	
Sanitary flange DIN 11851	
• with slotted union nut DN 50 PN 25	<b>N03</b>
• with slotted union nut DN 80 PN 25	<b>N05</b>
Tri-Clamp	
• DIN 32676 DN 50 PN 16	<b>N14</b>
• DIN 32676 DN 65 PN 10	<b>N15</b>
• ISO 2852 2" PN 40	<b>N22</b>
• ISO 2852 3" PN 40	<b>N23</b>
Aseptic threaded socket	
• DIN 11864-1 Form A DN 50 PN 25	<b>N33</b>
• DIN 11864-1 Form A DN 65 PN 25	<b>N34</b>
• DIN 11864-1 Form A DN 80 PN 25	<b>N35</b>
• DIN 11864-1 Form A DN100 PN 25	<b>N36</b>
Aseptic flange with notch	
• DIN 11864-2 Form A DN 50 PN 16	<b>N43</b>
• DIN 11864-2 Form A DN 65 PN 16	<b>N44</b>
• DIN 11864-2 Form A DN 80 PN 16	<b>N45</b>
• DIN 11864-2 Form A DN100 PN 16	<b>N46</b>
Aseptic clamp with groove	
• DIN 11864-3 Form A DN 50 PN 25	<b>N53</b>
• DIN 11864-3 Form A DN 65 PN 25	<b>N54</b>
• DIN 11864-3 Form A DN 80 PN 16	<b>N55</b>
• DIN 11864-3 Form A DN100 PN 16	<b>N56</b>

Options	Order code
<b>Sanitary connections manufacturer-specific</b>	
Varivent type N for pipes DN 40 ... DN 125 PN 40	<b>P06</b>
NEUMO BioConnect flange	
• DN 50 PN 16	<b>P14</b>
• DN 65 PN 16	<b>P15</b>
• DN 80 PN 16	<b>P16</b>
• DN100 PN 16	<b>P17</b>
• 2" PN 16	<b>P23</b>
• 2 ½" PN 16	<b>P24</b>
• 3" PN 16	<b>P25</b>
• 4" PN 16	<b>P26</b>
NEUMO BioConnect clamp	
• DN 50 PN 16	<b>P34</b>
• DN 65 PN 10	<b>P35</b>
• DN 80 PN 10	<b>P36</b>
• DN 100 PN 10	<b>P37</b>
• 2 ½" PN 16	<b>P43</b>
• 3" PN 10	<b>P44</b>
• 4" PN 10	<b>P45</b>
NEUMO BioControl flange	
• DN 50 PN 16	<b>P51</b>
• DN 65 PN 16	<b>P52</b>
• DN 80 PN 16	<b>P53</b>
<b>Sanitary connections special design</b>	
Tank connection	
• TG 52/50 PN 40 with seal	<b>Q00</b>
• TG 52/150 PN 40 with seal	<b>Q01</b>
DRD flange D = 65 mm DN 50 PN 40	<b>Q15</b>
SMS socket	
• with union nut 2" PN 25	<b>Q22</b>
• with union nut 2 ½" PN 25	<b>Q23</b>
• with union nut 3" PN 25	<b>Q24</b>
• with thread 2" PN 25	<b>Q28</b>
• with thread 2 ½" PN 25	<b>Q29</b>
• with thread 3" PN 25	<b>Q30</b>
IDF socket	
• with union nut ISO 2853 2" PN 25	<b>Q42</b>
• with union nut ISO 2853 2 ½" PN 25	<b>Q43</b>
• with union nut ISO 2853 3" PN 25	<b>Q44</b>
• with thread ISO 2853 2" PN 25	<b>Q48</b>
• with thread ISO 2853 2 ½" PN 25	<b>Q49</b>
• with thread ISO 2853 3" PN 25	<b>Q50</b>
<b>Weldable sockets for tank connection</b>	
Weldable piece for TG52/50	<b>Q90</b>
Weldable piece for TG52/150	<b>Q91</b>
<b>Connections for the paper industry</b>	
Process connection PMC Style Standard	<b>R00</b>
Process connection PMC Style Minibolt	<b>R01</b>
Weldable sockets for PMC Style Standard	<b>R02</b>
Weldable sockets for PMC Style Minibolt	<b>R03</b>
<b>Threaded connection</b>	
Male thread G¾-A DIN 3852	<b>R11</b>
Male thread G1-A DIN 3852	<b>R12</b>
Male thread G2-A DIN 3852	<b>R14</b>
<b>Special options front-flush</b>	
Temperature decoupler (media temperature up to 200 °C)	<b>R85</b>
Mating connector including seal	<b>R90</b>



## Pressure Measurement

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

<i>Customer-specific device settings</i>	Order code
Add "-Z" to article no., specify order code and plain text or drop-down list selection.	
<b>Measuring span</b> <b>Start of scale value (max. 5 characters),</b> <b>full scale value (max. 5 characters),</b> <b>unit [mbar, bar, kPa, MPa, psi, ...],</b> <b>example: -0.5 ... 10.5 psi</b>  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 <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr	Y01
<b>TAG</b> <b>(on stainless steel plate and device parameters,</b> <b>max. 32 characters)</b>  Input field: Free text, max. 32 characters	Y15
<b>Measuring point description</b> <b>(on stainless steel plate and device parameters,</b> <b>max. 32 characters)</b>  Input field: Free text, max. 32 characters	Y16
<b>TAG short</b> <b>(device parameters, max. 8 characters)</b>  Input field: Free text, max. 8 characters	Y17
<b>Local display</b> <b>[Pressure, Percent], reference [None, Absolute, Rela-</b> <b>tive], example: Pressure gauge</b>  Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	Y21
<b>Local display</b> <b>Scaling with standard units</b> <b>[m<sup>3</sup>/s, l/s, m, inch, ...], example 1 ... 5 m</b>  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 <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI.	Y22
<b>Local display</b> <b>Scaling with user-specific units (max. 12 characters),</b> <b>example 1 ... 5 m</b>  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
<b>Saturation limits instead of 3.8 ... 20.5 mA,</b> <b>example: 3.8 ... 22.0 mA</b>  Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	Y30
<b>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</b>  Drop-down list: 3.75; 21.75; 22.5; 22.6	Y31
<b>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</b>  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
<b>ID number of special version</b>  Input field: max. 4 characters and only natural numbers from 0 ... 9999	Y99

# Pressure Measurement

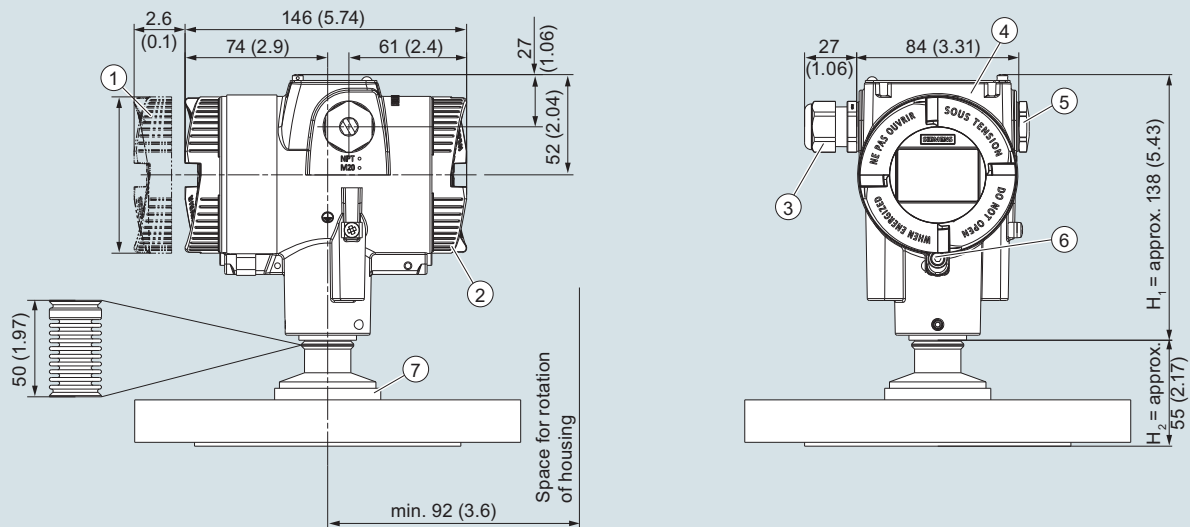
## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

1

#### Dimensional drawings



- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>① Electronic side, display (longer overall length for cover with window)<sup>1)</sup></li> <li>② Terminal side</li> <li>③ Electrical connection: screw gland M20 x 1,5<sup>3)</sup> or screw gland ½-14 NPT or Han 7D/Han 8D<sup>2)</sup> device plug or M12 device plug<sup>2) 3)</sup></li> </ul> | <ul style="list-style-type: none"> <li>④ Cover over buttons and nameplate with general information</li> <li>⑤ Blanking plug</li> <li>⑥ Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure")</li> <li>⑦ Process connection</li> </ul> |
|--|--|

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XPI]"

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

This figure consists of a SITRANS P320/P420 with an example flange.

In this figure, the height is divided into  $H_1$  and  $H_2$ .

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

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

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

## Pressure Measurement

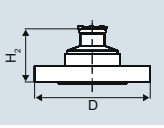
Transmitters for applications with advanced requirements (Advanced)  
SITRANS P320/P420

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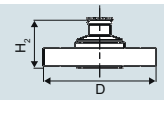
for gauge and absolute pressure, flush-mounted diaphragm

### Flanges according to EN and ASME

Flange according to EN

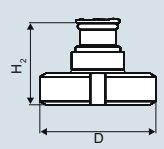
EN 1092-1					
	Order code	DN	PN	ØD	H <sub>2</sub>
	M03	50	16	165 mm (6.5")	Approx. 52 mm (2")
	M05	80	16	200 mm (7.9")	
	M10	25	40	115 mm (4.5")	
	M12	40	40	150 mm (5.9")	
	M13	50	40	165 mm (6.5")	
	M15	80	40	200 mm (7.9")	
	M22	40	100	170 mm (6.7")	

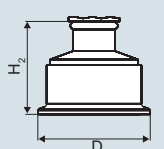
Flanges according to ASME

ASME B16.5					
	Order code	DN	Class	ØD	H <sub>2</sub>
	M30	1"	150	110 mm (4.3")	Approx. 52 mm (2")
	M31	1½"	150	130 mm (5.1")	
	M32	2"	150	150 mm (5.9")	
	M33	3"	150	190 mm (7.5")	
	M34	4"	150	230 mm (9.1")	
	M35	1"	300	125 mm (4.9")	
	M36	1½"	300	155 mm (6.1")	
	M37	2"	300	165 mm (6.5")	
	M38	3"	300	210 mm (8.1")	
	M39	4"	300	255 mm (10.0")	

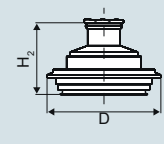
### NuG and pharmaceutical connections

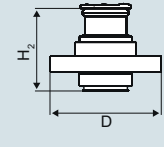
Connections to DIN

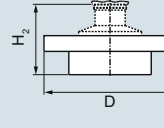
DIN 11851 (milk pipe union with slotted union nut)					
	Order code	DN	PN	ØD	H <sub>2</sub>
	N03	50	25	92 mm (3.6")	Approx. 52 mm (2")
	N05	80	25	127 mm (5.0")	

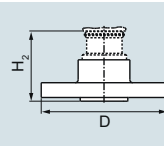
TriClamp according to DIN 32676					
	Order code	DN	PN	ØD	H <sub>2</sub>
	N14	50	16	64 mm (2.5")	Approx. 52 mm (2")
	N15	65	10	91 mm (3.6")	
	N22	2"	16	64 mm (2.5")	Approx. 52 mm (2")
	N23	3"	10	91 mm (3.6")	

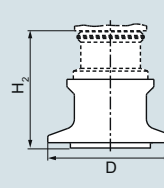
Other connections

Varivent connection					
	Order code	DN	PN	ØD	H <sub>2</sub>
	P06	40 ... 125	40	84 mm (3.3")	Approx. 52 mm (2")

Bio-control connection					
	Order code	DN	PN	ØD	H <sub>2</sub>
	P51	50	16	90 mm (3.5")	Approx. 52 mm (2")
	P52	65	16	120 mm (4.7")	
	P53	80	16	150 mm (5.9")	

Sanitary process connection according to DRD					
	Order code	DN	PN	ØD	H <sub>2</sub>
	Q15	65	40	105 mm (4.1")	Approx. 52 mm (2")

Sanitary process connection according to NEUMO BioConnect flange connection					
	Order code	DN	PN	ØD	H <sub>2</sub>
	P14	50	16	110 mm (4.3")	Approx. 52 mm (2")
	P15	65	16	140 mm (5.5")	
	P16	80	16	150 mm (5.9")	
	P17	100	16	175 mm (6.9")	
	P23	2"	16	100 mm (3.9")	
	P24	2½"	16	110 mm (4.3")	
	P25	3"	16	140 mm (5.5")	
	P26	4"	16	175 mm (6.9")	

Sanitary process connection according to NEUMO BioConnect clamp connection					
	Order code	DN	PN	ØD	H <sub>2</sub>
	P34	50	16	77.4 mm (3.0")	Approx. 52 mm (2")
	P35	65	10	90.9 mm (3.6")	
	P36	80	10	106 mm (4.2")	
	P37	100	10	119 mm (4.7")	
	P43	2½"	16	77.4 mm (3.0")	
	P44	3"	10	90.9 mm (3.6")	
	P45	4"	10	119 mm (4.7")	

# Pressure Measurement

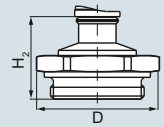
## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

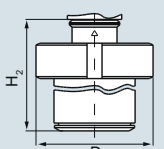
for gauge and absolute pressure, flush-mounted diaphragm

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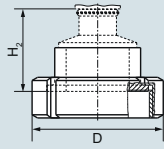
**Threaded connection G $\frac{3}{4}$ ", G1" and G2" acc. to DIN 3852**

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

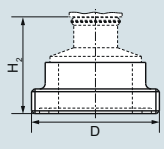
**Tank connection TG 52/50 and TG52/150**

	Order code	DN	PN	ØD	H <sub>2</sub>
	<b>Q00</b>	25	40	63 mm (2.5")	Approx. 63 mm (2.5")
	<b>Q01</b>	25	40	63 mm (2.5")	Approx. 170 mm (6.7")

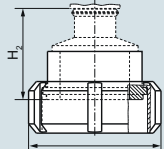
**SMS socket with union nut**

	Order code	DN	PN	ØD	H <sub>2</sub>
	<b>Q22</b>	2"	25	84 mm (3.3")	Approx. 52 mm (2.1")
	<b>Q23</b>	2½"	25	100 mm (3.9")	
	<b>Q24</b>	3"	25	114 mm (4.5")	

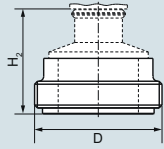
**SMS threaded socket**

	Order code	DN	PN	ØD	H <sub>2</sub>
	<b>Q28</b>	2"	25	70 x 1/6 mm	Approx. 52 mm (2.1")
	<b>Q29</b>	2½"	25	85 x 1/6 mm	
	<b>Q30</b>	3"	25	98 x 1/6 mm	

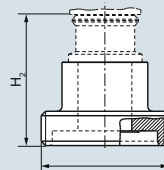
**IDF socket with union nut**

	Order code	DN	PN	ØD	H <sub>2</sub>
	<b>Q28</b>	2"	25	77 mm (3")	Approx. 52 mm (2.1")
	<b>Q29</b>	2½"	25	91 mm (3.6")	
	<b>Q30</b>	3"	25	106 mm (4.2")	

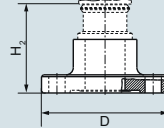
**IDF threaded socket**

	Order code	DN	PN	ØD	H <sub>2</sub>
	<b>Q48</b>	2"	25	64 mm (2.5")	Approx. 52 mm (2.1")
	<b>Q49</b>	2½"	25	77.5 mm (3.1")	
	<b>Q50</b>	3"	25	91 mm (3.6")	

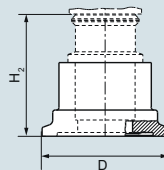
**Aseptic threaded socket according to DIN 11864-1 Form A**

	Order code	DN	PN	ØD	H <sub>2</sub>
	<b>N33</b>	50	25	78 x 1/6"	Approx. 52 mm (2.1")
	<b>N34</b>	65	25	95 x 1/6"	
	<b>N35</b>	80	25	110 x ¼"	
	<b>N36</b>	100	25	130 x ¼"	

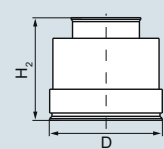
**Aseptic flange with notch to DIN 11864-2 Form A**

	Order code	DN	PN	ØD	H <sub>2</sub>
	<b>N43</b>	50	16	94 (3.7")	Approx. 52 mm (2.1")
	<b>N44</b>	65	16	113 (4.4")	
	<b>N45</b>	80	16	133 (5.2")	
	<b>N46</b>	100	16	159 (6.3")	

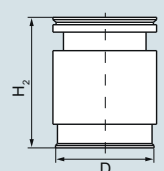
**Aseptic clamp with groove according to DIN 11864-3 Form A**

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

**Process connection PMC Style Standard**

	Order code	DN	PN	ØD	H <sub>2</sub>
	<b>R00</b>	-	-	40.9 mm (1.6")	Approx. 36.8 mm (1.4")

**Process connection PMC Style Minibolt**

	Order code	DN	PN	ØD	H <sub>2</sub>
	<b>R01</b>	-	-	26.3 mm (1.0")	Approx. 33.1 mm (1.3")

# Pressure Measurement

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

for absolute pressure (pressure series)

1

## Technical specifications

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

#### Input

Measured variable	Absolute pressure		
Span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086)	Span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar a	4 bar a	6 bar a
	0.83 ... 25 kPa a	0.4 MPa a	0.6 MPa a
	3.3 ... 100.5 inH <sub>2</sub> 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 <sub>2</sub> 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	380 bar a
	0.53 ... 16 MPa a	24 MPa	38 MPa a
	77 ... 2321 psi a	3480 psi	5511 psi a
	13.3 ... 400 bar a	400 bar a	600 bar a
	1.3 ... 40 MPa a	40 MPa a	60 MPa a
	192 ... 5802 psi a	5802 psi a	8702 psi a
	23.3 ... 700 bar a	800 bar a	800 bar a
	2.3 ... 70 MPa a	80 MPa a	80 MPa a
	337 ... 10153 psi a	11603 psi a	11603 psi a
Measuring limits	0 mbar a/kPa a/psi a		
• Low measuring limit	For process temperature $-20\text{ °C} < \vartheta \leq +60\text{ °C}$ ( $-4\text{ °F} < \vartheta \leq +140\text{ °F}$ )		
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert oil	For process temperature $60\text{ °C} < \vartheta \leq +100\text{ °C}$ (max. $85\text{ °C}$ for measuring cell 30 bar) ( $140\text{ °F} < \vartheta \leq +212\text{ °F}$ (max. $185\text{ °F}$ 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 $60\text{ °C}$ ( $140\text{ °F}$ ) ambient temperature/process temperature)		
• Start of scale	Between the measuring limits (infinitely adjustable)		
<b>Output</b>	<b>HART</b>		
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 [ $\Omega$ ]		
• 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"> <li>• Linearly increasing or linearly decreasing</li> <li>• Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul>		
Physical bus	-		
Polarity-independent	-		

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (pressure series)

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

##### Measuring accuracy

Reference conditions

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

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio  $r$  (spread, Turn-Down)

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

- Linear characteristic (all measuring cells)

-  $r \leq 10$

$\leq 0.1\%$

-  $10 < r \leq 30$

$\leq 0.2\%$

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

- 250 mbar a/25 kPa a/3.6 psi a
- 1300 mbar a/130 kPa a/18.8 psi a  
5 bar a/500 kPa a/72.5 psi a  
30 bar a/3000 kPa a/435 psi a  
100 bar a/10 MPa a/1450 psi a  
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  $\pm 30$  °C ( $\pm 54$  °F)

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

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

Approx. 0.2 s

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

$\leq 0.05$  mbar/0.005 kPa/0.000725 psi per 10° incline  
(zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

##### Rated conditions

Temperature of medium

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

-40 ... +100 °C (-40 ... +212 °F)

- 1 bar/100 kPa/3.6 psi

4 bar/400 kPa/58 psi

16 bar/1.6 MPa/232 psi

63 bar/6.3 MPa/914 psi

-40 ... +85 °C (-40 ... +185 °F)

- 160 bar/16 MPa/2321 psi

400 bar/40 MPa/5802 psi

700 bar/70 MPa/10153 psi

-20 ... +100 °C (-4 ... +212 °F)

- Measuring cell with FDA-compliant oil

-10 ... +100 °C (14 ... +212 °F)

Ambient conditions

- Ambient temperature/enclosure

Observe the temperature class in areas subject to explosion hazard.

- Measuring cell with silicone oil filling

-40 ... +85 °C (-40 ... +185 °F)

- Measuring cell with inert oil for gauge pressure measuring cells:

-40 ... +85 °C (-40 ... +185 °F)

1 bar/100 kPa/3.6 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

-20 ... +85 °C (-4 ... +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

## Pressure Measurement

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

### for absolute pressure (pressure series)

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

##### Design

Weight	Approx. 2.3 kg (5.07 lb) with aluminum enclosure Approx. 4.2 kg (9.25 lb) for stainless steel enclosure
Material	
<ul style="list-style-type: none"> <li>• Wetted parts materials           <ul style="list-style-type: none"> <li>- Process connection</li> <li>- Oval flange</li> <li>- Seal diaphragm</li> </ul> </li> <li>• Non-wetted parts materials           <ul style="list-style-type: none"> <li>- Electronics housing</li> <li>- Mounting bracket</li> </ul> </li> </ul>	Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602 Stainless steel, mat. no. 1.4404/316L Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819  • Low-copper die-cast aluminum GD-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) Electrogalvanized steel or stainless steel
Process connection	<ul style="list-style-type: none"> <li>• Connection shank G1/2A according to DIN EN 837-1</li> <li>• Female thread 1/2-14 NPT</li> <li>• Male thread M20 x 1.5 and 1/2-14 NPT</li> <li>• Oval flange (PN 160 (MWP 2320 psi g)) with fastening screw thread:</li> <li>• Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread:           <ul style="list-style-type: none"> <li>- 7/16-20 UNF according to EN 61518</li> <li>- M10 according to DIN 19213</li> </ul> </li> <li>• Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread:           <ul style="list-style-type: none"> <li>- 7/16-20 UNF according to EN 61518</li> <li>- M12 according to DIN 19213</li> </ul> </li> <li>• Male thread M20 x 1.5 and 1/2-14 NPT</li> </ul>
Electrical connection	Cable entry via the following screwed glands: <ul style="list-style-type: none"> <li>• M20 x 1.5</li> <li>• 1/2-14 NPT</li> <li>• Han 7D/Han 8D device plug<sup>1)</sup></li> <li>• M12 device plug</li> </ul>

##### Displays and controls

Keys	4 keys for operation directly on the device
Display	<ul style="list-style-type: none"> <li>• With or without integrated display (optional)</li> <li>• Cover with inspection window (optional)</li> </ul>

##### 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)	Available soon
• ACS (France)	Available soon
• DVGW (Germany)	Available soon
• NSF (USA)	Available soon
CRN (Canada)	Available soon
Explosion protection acc. to NEPSI (China)	Available soon
Explosion protection acc. to INMETRO (Brazil)	Available soon
BAM (Germany), oxygen expenditures	Available soon

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (pressure series)

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

## Explosion protection

## • Intrinsic safety "i"

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

## • 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 Zone 20, 21, 22

- Marking Ex II 1D Ex tb IIIC T120 °C Da  
Ex II 2D Ex tb IIIC T120 °C Db  
Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium -40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature 120 °C (248 °F)
- Connection To a circuit with the operating values:  
 $U_n = 10.5 \text{ to } 45 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$

## • Dust explosion protection for Zone 20, 21, 22

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

## • Effective internal inductance/capacitance

## • Type of protection for Zone 2

- Marking Ex II 3G Ex ec IIC T4/T6 Gc  
Ex II 3G Ex ic IIC T4/T6 Gc
- Permissible ambient temperature "ec" -40 ... +80 °C (-40 ... +176 °F) temperature class T4  
-40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible ambient temperature "ic" -40 ... +80 °C (-40 ... +176 °F) temperature class T4  
-40 ... +80 °C (-40 ... +176 °F) temperature class T6
- Permissible temperature of measuring medium -40 ... +100 °C (-40 ... +212 °F) temperature class T4  
-40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection To a circuit with the operating values:  
 $U_n = 10.5 \text{ to } 30 \text{ V}$ ,  $4 \text{ ... } 20 \text{ mA}$
- "ic" connection To certified intrinsically safe circuits with the peak values:  
 $U_i = 30 \text{ V}$ ,  $I_i = 101 \text{ mA}$ ,  $P_i = 760 \text{ mW}$   
 $U_i = 29 \text{ V}$ ,  $I_i = 110 \text{ mA}$ ,  $P_i = 800 \text{ mW}$

• Effective internal inductance/capacitance:  
 $L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$ 

## • 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

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

**HART communication**

HART	230 ... 1100 $\Omega$
Protocol	HART 7
Software for computer	SIMATIC PDM



# Pressure Measurement

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

for absolute pressure (pressure series)

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## Selection and ordering data

	Article No.
<b>Pressure transmitters for absolute pressure (pressure series)</b>	
<b>SITRANS P320</b>	➤ 7MF032 - - - - -
<b>SITRANS P420</b>	➤ 7MF042 - - - - -
➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
<b>Communication</b>	
HART, 4 ... 20 mA	0
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
Neobee oil	4
<b>Maximum measuring span</b>	
250 mbar a (100.5 inH <sub>2</sub> O a)	F
1 300 mbar a (522 inH <sub>2</sub> 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 (10153 psi a)	X
<b>Process connection</b>	
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
<b>Wetted parts materials: Process connection, seal diaphragm</b>	
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
<b>Non-wetted parts materials</b>	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
<b>Enclosure</b>	
Dual chamber device	5
<b>Type of protection</b>	
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
<b>Electrical connections/cable entries</b>	
Thread for cable gland	
• 2 x M20 x 1.5	F
• 2 x ½-14 NPT	M
<b>Local operation/display</b>	
Without display (cover closed)	0
With display (cover closed)	1
With display (cover with glass pane)	2

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (pressure series)

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#### Selection and ordering data

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

Options	Order code
<b>Device options</b>	
PDF file with device settings	<b>D10</b>
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	<b>D20</b>
FVMQ enclosure sealing	<b>D21</b>
IP66/IP68 degree of protection (not for M12 and Han device plugs)	<b>D30</b>
TAG label empty	<b>D40</b>
Without labeling of the measuring range on the TAG label	<b>D41</b>
Stainless steel Ex plate 1.4404/316L	<b>D42</b>
Increase of pressure stage from PN 420 to PN 500	<b>D50</b>
Overvoltage protection up to 6 kV (external)	<b>D71</b>
Adhesive labels on transport packaging (supplied by customer)	<b>D90</b>
<b>General approval without Ex approval</b>	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
CSA	<b>E06</b>
EAC	<b>E07</b>
FM	<b>E08</b>
KCC	<b>E09</b>
UL	<b>E10</b>
<b>Explosion protection approvals</b>	
ATEX (Europe)	<b>E20</b>
CSA (USA and Canada)	<b>E21</b>
FM (USA and Canada)	<b>E22</b>
IECEx (Worldwide)	<b>E23</b>
EACEx (GOST-R, -K, -B)	<b>E24</b>
INMETRO (Brazil)	<b>E25</b>
KCs (Korea)	<b>E26</b>
NEPSI (China)	<b>E27</b>
PESO (India)	<b>E28</b>
TIIS Hazardous (Japan)	<b>E29</b>
UKR Sepro (Ukraine)	<b>E30</b>
ATEX (Europe) and IECEx (Worldwide)	<b>E47</b>
CSA (Canada) and FM (USA)	<b>E48</b>
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	<b>E49</b>
<b>Marine approvals</b>	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
LR (Lloyds Register)	<b>E51</b>
BV (Bureau Veritas)	<b>E52</b>
ABS (American Bureau of Shipping)	<b>E53</b>
KR (Korean Register of Shipping)	<b>E56</b>
RINA (Registro Italiano Navale)	<b>E57</b>
CCS (China Classification Society)	<b>E58</b>
<b>Country-specific approvals</b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>

## Pressure Measurement

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

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### for absolute pressure (pressure series)

Options	Order code
<b>Special approvals</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
Dual seal	<b>E81</b>
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	<b>E83</b>
NSF61 (drinking water)	<b>E84</b>
ACS (drinking water)	<b>E85</b>
<b>Mounting bracket</b>	
Steel, galvanized	<b>H01</b>
Stainless steel 1.4301/304	<b>H02</b>
Stainless steel 1.4404/316L	<b>H03</b>
<b>Flange connections with flange EN 1092-1</b>	
With flange adapter G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J80</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J81</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J82</b>
With siphon G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J83</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J84</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J85</b>
• DN 25 PN 100, stainless steel 1.4571/316Ti	<b>J86</b>
<b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>	
Seal (EN 837-1) material Fe (soft iron)	<b>K60</b>
Seal (EN 837-1) material 1.4571	<b>K61</b>
Seal (EN 837-1) material Cu	<b>K62</b>
<b>Process connection</b>	
Process connection male thread G½, bore hole 11 mm	<b>K80</b>
<b>Shut-off valves, pneumatic blocks</b>	
With mounted pneumatic block 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in test report (EN 10204-2.2)	<b>T02</b>
With mounted pneumatic block 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in test report (EN 10204-2.2)	<b>T03</b>
With mounted pneumatic block 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in test report (EN 10204-2.2)	<b>T05</b>
With mounted pneumatic block 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in test report (EN 10204-2.2)	<b>T06</b>

### Selection and ordering data

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

# Pressure Measurement

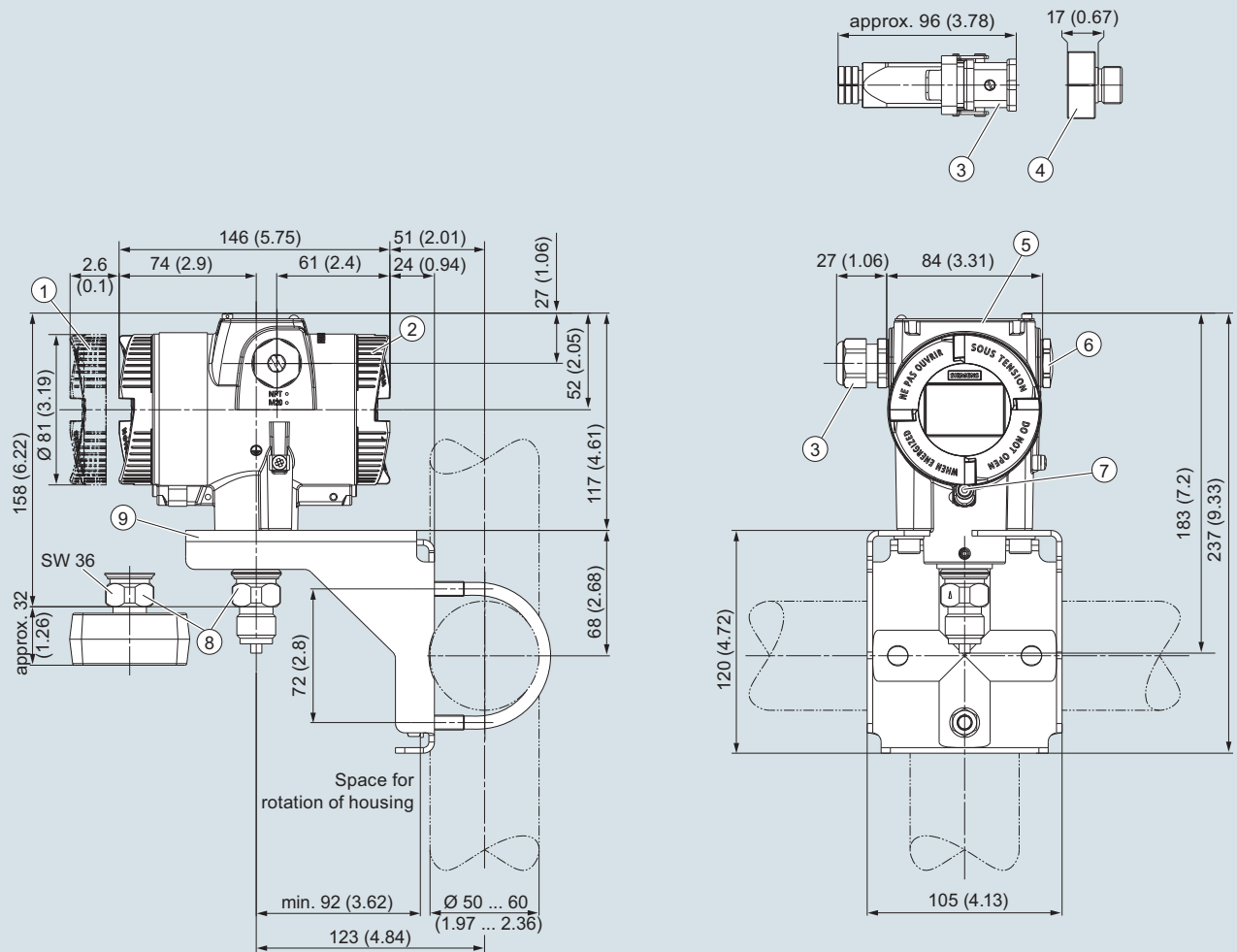
## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (pressure series)

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## Dimensional drawings



① Electronic side, display  
(longer overall length for cover with window)<sup>1)</sup>

② Terminal side

③ Electrical connection:  
screw gland M20 x 1,5<sup>3)</sup> or screw gland ½-14 NPT or  
Han 7D/Han 8D<sup>2) 3)</sup> device plug or M12 device plug<sup>2) 3)</sup>

④ Harting adapter

⑤ Cover over buttons and nameplate  
with general information

⑥ Blanking plug

⑦ Screw cover - safety bracket

(only for type of protection "Explosion-proof enclosure")

⑧ Process connection: connection shank G½B or oval flange

⑨ Mounting bracket (option)

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"

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

## Pressure Measurement

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

for absolute pressure (differential pressure series)

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### Technical specifications

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

##### Input

Measured variable	Absolute pressure		
Span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar a	32 bar a	48 bar a
	0.83 ... 25 kPa a	3.2 MPa a	4.8 MPa a
	3.3 ... 100.5 inH <sub>2</sub> O a	464 psi a	696 psi a
	43 ... 1300 mbar a	32 bar a	48 bar a
	4.3 ... 130 kPa a	3.2 MPa a	4.8 MPa a
	17.3 ... 522 inH <sub>2</sub> O a	464 psi a	696 psi a
	166 ... 5000 mbar a	32 bar a	240 bar a
	16.6 ... 500 kPa a	3.2 MPa a	24 MPa a
	2.41 ... 72.5 psi a	464 psi a	3480 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	3480 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	3480 psi a
Measuring limits	0 mbar a/kPa a/psi a		
• Low measuring limit	For process temperature $-20\text{ °C} < \vartheta \leq +60\text{ °C}$ ( $-4\text{ °F} < \vartheta \leq +140\text{ °F}$ )		
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert liquid	For process temperature $60\text{ °C} < \vartheta \leq +100\text{ °C}$ (max. 85 °C for measuring cell 30 bar) ( $140\text{ °F} < \vartheta \leq +212\text{ °F}$ (max. 185 °F for measuring cell 435 psi))		
	3 kPa a + 2 kPa a · ( $\vartheta - 60\text{ °C}$ )/°C		
	0.44 psi a + 0.29 psi a · ( $\vartheta - 140\text{ °F}$ )/°F		
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/process temperature)		
• Start of scale	Between the measuring limits (infinitely adjustable)		
<b>Output</b>	<b>HART</b>		
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 [ $\Omega$ ]		
• 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"> <li>• Linearly increasing or linearly decreasing</li> <li>• Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul>		
Physical bus	-		
Polarity-independent	-		
<b>Measuring accuracy</b>			
Reference conditions	<ul style="list-style-type: none"> <li>• According to EN 60770-1</li> <li>• Rising characteristic curve</li> <li>• Start of scale value 0 bar/kPa/psi</li> <li>• Seal diaphragm stainless steel</li> <li>• Measuring cell with silicone oil filling</li> <li>• Room temperature 25 °C (77 °F)</li> </ul>		

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (differential pressure series)

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

Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio $r$ (spread, Turn-Down)	$r$ = maximum measuring span/set measuring span or nominal measuring range
<ul style="list-style-type: none"> <li>• Linear characteristic (all measuring cells)               <ul style="list-style-type: none"> <li>- <math>r \leq 10</math> <span style="float: right;"><math>\leq 0.1\%</math></span></li> <li>- <math>10 &lt; r \leq 30</math> <span style="float: right;"><math>\leq 0.2\%</math></span></li> </ul> </li> </ul>	
Influence of ambient temperature (in % per 28 °C (50 °F))	
<ul style="list-style-type: none"> <li>• 250 mbar a/25 kPa a/3.6 psi a <span style="float: right;"><math>\leq (0.15 \cdot r + 0.1)\%</math></span></li> <li>• 1300 mbar a/130 kPa a/18.8 psi a <span style="float: right;"><math>\leq (0.08 \cdot r + 0.16)\%</math></span> <ul style="list-style-type: none"> <li>5 bar a/500 kPa a/72.5 psi a</li> <li>30 bar a/3000 kPa a/435 psi a</li> <li>100 bar a/10 MPa a/1450 psi a</li> <li>160 bar a/16 MPa a/2321 psi a</li> <li>400 bar a/40 MPa a/5802 psi a</li> <li>700 bar a/70 MPa a/10152 psi a</li> </ul> </li> </ul>	
Long-term stability at $\pm 30$ °C ( $\pm 54$ °F)	In 5 years $\leq (0.25 \cdot r)\%$
Step response time $T_{63}$ (without electrical damping)	Approx. 0.2 s
Effect of mounting position (in pressure per change of angle)	$\leq 0.7$ mbar/0.07 kPa/0.001015 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
<b>Rated conditions</b>	
Temperature of medium	
<ul style="list-style-type: none"> <li>• Measuring cell with silicone oil filling               <ul style="list-style-type: none"> <li>- Measuring cell 30 bar (435 psi), PN 420 <span style="float: right;">-40 ... +100 °C (-40 ... +212 °F)</span></li> <li>- Measuring cell 30 bar (435 psi), PN 420 <span style="float: right;">-20 ... +85 °C (-4 ... +185 °F)</span></li> </ul> </li> <li>• Measuring cell with inert oil               <ul style="list-style-type: none"> <li>- Measuring cell 30 bar (435 psi), PN 420 <span style="float: right;">-20 ... +100 °C (-4 ... +212 °F)</span></li> <li>- Measuring cell 30 bar (435 psi), PN 420 <span style="float: right;">-20 ... +85 °C (-4 ... +185 °F)</span></li> </ul> </li> <li>• Measuring cell with FDA-compliant oil <span style="float: right;">-10 ... +100 °C (14 ... +212 °F)</span></li> <li>• In conjunction with dust explosion protection <span style="float: right;">-40 ... +85 °C (-4 ... +185 °F)</span></li> </ul>	
Ambient conditions	
<ul style="list-style-type: none"> <li>• Ambient temperature/enclosure               <ul style="list-style-type: none"> <li>- Measuring cell with silicone oil filling <span style="float: right;">Observe the temperature class in areas subject to explosion hazard.</span></li> <li>- Measuring cell with silicone oil filling, measuring cell 30 bar (435 psi), PN 420 <span style="float: right;">-40 ... +85 °C (-40 ... +185 °F)</span></li> <li>- Measuring cell with inert oil <span style="float: right;">-20 ... +85 °C (-4 ... +185 °F)</span></li> <li>- Measuring cell with FDA-compliant oil <span style="float: right;">-10 ... +85 °C (14 ... +185 °F)</span></li> <li>- Display <span style="float: right;">-20 ... +80 °C (-4 ... +176 °F)</span></li> </ul> </li> <li>• Storage temperature <span style="float: right;">-50 ... +85 °C (-58 ... +185 °F); with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F)</span></li> <li>• Climatic class in accordance with IEC 60721-3-4 <span style="float: right;">4K4H</span></li> <li>• Degree of protection               <ul style="list-style-type: none"> <li>- According to IEC 60529 <span style="float: right;">IP66, IP68</span></li> <li>- According to NEMA 250 <span style="float: right;">Type 4X</span></li> </ul> </li> <li>• Electromagnetic compatibility               <ul style="list-style-type: none"> <li>- Emitted interference and interference immunity <span style="float: right;">According to IEC 61326 and NAMUR NE 21</span></li> </ul> </li> </ul>	
<b>Design</b>	
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"> <li>• Wetted parts materials               <ul style="list-style-type: none"> <li>- Seal diaphragm <span style="float: right;">Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold</span></li> <li>- Process flanges and sealing plugs <span style="float: right;">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</span></li> <li>- O-ring <span style="float: right;">FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR</span></li> </ul> </li> <li>• Non-wetted parts materials               <ul style="list-style-type: none"> <li>- Electronics housing                   <ul style="list-style-type: none"> <li>• Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M</li> <li>• Standard: Powder coating with polyurethane</li> <li style="padding-left: 20px;">Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane</li> <li>• Stainless steel type plate (1.4404/316L)</li> </ul> </li> <li>- Pressure flange screws <span style="float: right;">Stainless steel ISO 3506-1 A4-70</span></li> <li>- Mounting bracket <span style="float: right;">Steel, electrogalvanized steel, or stainless steel</span></li> </ul> </li> </ul>	
Process connection	$\frac{1}{2}$ -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"> <li>• M20 x 1.5</li> <li>• <math>\frac{1}{2}</math>-14 NPT</li> <li>• Han 7D/Han 8D device plug<sup>1)</sup></li> <li>• M12 device plug</li> </ul>

## Pressure Measurement

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

### for absolute pressure (differential pressure series)

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

##### Displays and controls

Keys	4 keys for operation directly on the device
Display	<ul style="list-style-type: none"> <li>• With or without integrated display (optional)</li> <li>• Cover with inspection window (optional)</li> </ul>

##### 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)	Available soon
• ACS (France)	Available soon
• DVGW (Germany)	Available soon
• NSF (USA)	Available soon
CRN (Canada)	Available soon
Explosion protection acc. to NEPSI (China)	Available soon
Explosion protection acc. to INMETRO (Brazil)	Available soon
BAM (Germany), oxygen expenditures	Available soon
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$ , $I_i = 101 \text{ mA}$ , $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$ , $I_i = 110 \text{ mA}$ , $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$
- Effective internal inductance/capacitance	
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To a circuit with the operating values: $U_n = 10.5 \text{ to } 45 \text{ V}$ , $4 \text{ ... } 20 \text{ mA}$
• Dust explosion protection for Zone 20, 21, 22	
- Marking	Ex II 1D Ex tb IIIC T120 °C Da Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To a circuit with the operating values: $U_n = 10.5 \text{ to } 45 \text{ V}$ , $4 \text{ ... } 20 \text{ mA}$
• Dust explosion protection for Zone 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db Ex II 3D Ex ic IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with the peak values: $U_i = 30 \text{ V}$ , $I_i = 101 \text{ mA}$ , $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$ , $I_i = 110 \text{ mA}$ , $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$
- Effective internal inductance/capacitance	

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (differential pressure series)

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

• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc Ex II 3G Ex ic IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible ambient temperature "ic"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +80 °C (-40 ... +176 °F) temperature class T6
- Permissible temperature of measuring medium	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- "ec" connection	To a circuit with the operating values: $U_n = 10.5$ to $30$ V, $4$ ... $20$ mA
- "ic" 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
• Explosion protection acc. to FM	Effective internal inductance/capacitance: $L_i = 0.24$ $\mu$ H/ $C_i = 3.29$ nF Available soon
- Marking (XP/DIP) or IS; NI; S	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
• Explosion protection according to CSA	Available soon
- Marking (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6; CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

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

#### HART communication

HART	230 ... 1100 $\Omega$
Protocol	HART 7
Software for computer	SIMATIC PDM



# Pressure Measurement

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

for absolute pressure (differential pressure series)

1

## Selection and ordering data

	Article No.
<b>Pressure transmitters for absolute pressure (differential pressure series)</b>	
<b>SITRANS P320</b>	↗ 7MF033 - - - - -
<b>SITRANS P420</b>	↗ 7MF043 - - - - -
↗ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
<b>Communication</b>	
HART, 4 ... 20 mA	0
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
Neobee oil	4
<b>Maximum measuring span</b>	
250 mbar a (100.5 inH <sub>2</sub> O a)	G
1 300 mbar a (522 inH <sub>2</sub> 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
<b>Process connection</b>	
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
<b>Wetted parts materials: Process connection, seal diaphragm</b>	
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
Tantalum/tantalum	4
Monel 00/2.4360, Monel 400/2.4360	6
Stainless steel 316L/1.4404, gold-plated	8
<b>Non-wetted parts materials</b>	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
<b>Enclosure</b>	
Dual chamber device	5
<b>Type of protection</b>	
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
<b>Electrical connections/cable entries</b>	
Thread for cable gland	
• 2 x M20 x 1.5	F
• 2 x 1/2"-14 NPT	M
<b>Local operation/display</b>	
Without display (cover closed)	0
With display (cover closed)	1
With display (cover with glass pane)	2

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for absolute pressure (differential pressure series)

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#### Selection and ordering data

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

Options	Order code
<b>Device options</b>	
PDF file with device settings	<b>D10</b>
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	<b>D20</b>
FVMQ enclosure sealing	<b>D21</b>
IP66/IP68 degree of protection (not for M12 and Han device plugs)	<b>D30</b>
TAG label empty	<b>D40</b>
Without labeling of the measuring range on the TAG label	<b>D41</b>
Stainless steel Ex plate 1.4404/316L	<b>D42</b>
Increase of pressure stage from PN 420 to PN 500	<b>D50</b>
Overvoltage protection up to 6 kV (external)	<b>D71</b>
Adhesive labels on transport packaging (supplied by customer)	<b>D90</b>
<b>General approval without Ex approval</b>	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
CSA	<b>E06</b>
EAC	<b>E07</b>
FM	<b>E08</b>
KCC	<b>E09</b>
UL	<b>E10</b>
<b>Explosion protection approvals</b>	
ATEX (Europe)	<b>E20</b>
CSA (USA and Canada)	<b>E21</b>
FM (USA and Canada)	<b>E22</b>
IECEx (Worldwide)	<b>E23</b>
EACEx (GOST-R, -K, -B)	<b>E24</b>
INMETRO (Brazil)	<b>E25</b>
KCs (Korea)	<b>E26</b>
NEPSI (China)	<b>E27</b>
PESO (India)	<b>E28</b>
TIIS Hazardous (Japan)	<b>E29</b>
UKR Sepro (Ukraine)	<b>E30</b>
ATEX (Europe) and IECEx (Worldwide)	<b>E47</b>
CSA (Canada) and FM (USA)	<b>E48</b>
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	<b>E49</b>
<b>Marine approvals</b>	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
LR (Lloyds Register)	<b>E51</b>
BV (Bureau Veritas)	<b>E52</b>
ABS (American Bureau of Shipping)	<b>E53</b>
KR (Korean Register of Shipping)	<b>E56</b>
RINA (Registro Italiano Navale)	<b>E57</b>
CCS (China Classification Society)	<b>E58</b>
<b>Country-specific approvals</b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>

## Pressure Measurement

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

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### for absolute pressure (differential pressure series)

Options	Order code
<b>Special approvals</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
Dual seal	<b>E81</b>
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	<b>E83</b>
NSF61 (drinking water)	<b>E84</b>
ACS (drinking water)	<b>E85</b>
<b>Mounting bracket</b>	
Steel, galvanized	<b>H01</b>
Stainless steel 1.4301/304	<b>H02</b>
Stainless steel 1.4404/316L	<b>H03</b>
<b>Process flanges; screw plug with vent valve</b>	
Welded in on right	<b>J08</b>
Welded in on left	<b>J09</b>
Glued in on right	<b>J10</b>
Glued in on left	<b>J11</b>
<b>Flange connections with flange EN 1092-1</b>	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J70</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J71</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J72</b>
• DN 15 PN 40, stainless steel 1.4571/316Ti	<b>J78</b>
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J73</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J74</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J75</b>
<b>Flange connection options</b>	
Flange connection and temperature extension	<b>J76</b>
Flange connection with epoxy resin coating	<b>J77</b>
<b>Process flanges; special materials</b>	
Reserved for 7MF7: without process flanges, without screws, without gaskets	<b>K00</b>
Process flange material alloy C4/2.4610	<b>K01</b>
Process flange material Monel 400/2.4360	<b>K02</b>
Process connection material PVDF, on the side ½-14 NPT	<b>K05</b>
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	<b>K06</b>
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	<b>K07</b>
<b>Process flanges; process connection option</b>	
Process flange with process connection G½ welded on	<b>K20</b>
Process connection (oval flange) NAM (ASTAVA)	<b>K21</b>
<b>Process flanges chambered with gaskets</b>	
1x chambered, graphite	<b>K40</b>
1x chambered, PTFE	<b>K41</b>
2x chambered, PTFE	<b>K42</b>
<b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>	
O-ring, process flanges, PTFE	<b>K50</b>
O-ring, process flanges, FEP (with silicone core, approved for food)	<b>K51</b>
O-ring, process flanges, FFKM (FFPM)	<b>K52</b>
O-ring, process flanges, NBR	<b>K53</b>
O-ring, process flanges, EPDM	<b>K54</b>

Options	Order code
<b>Process flange options</b>	
Process flanges for vertical differential pressure lines (half process flange)	<b>K81</b>
Process flanges (+) - side front	<b>K82</b>
Process flange screws, process flange nuts, material Monel 400/2.4360	<b>K83</b>
Valve ¼-18 NPT, material same as process flanges	<b>K84</b>
Valve mounted on the side, measured medium: Gas	<b>K85</b>
Oval flange enclosed, gasket PTFE + mounting screws	<b>K86</b>
<b>Pneumatic blocks</b>	
With mounted pneumatic block (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in test report (EN 10204-2.2)	<b>U01</b>
With mounted pneumatic block (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)	<b>U02</b>
With mounted pneumatic block (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in test report (EN 10204-2.2)	<b>U03</b>
With mounted pneumatic block (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)	<b>U04</b>

### Selection and ordering data

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

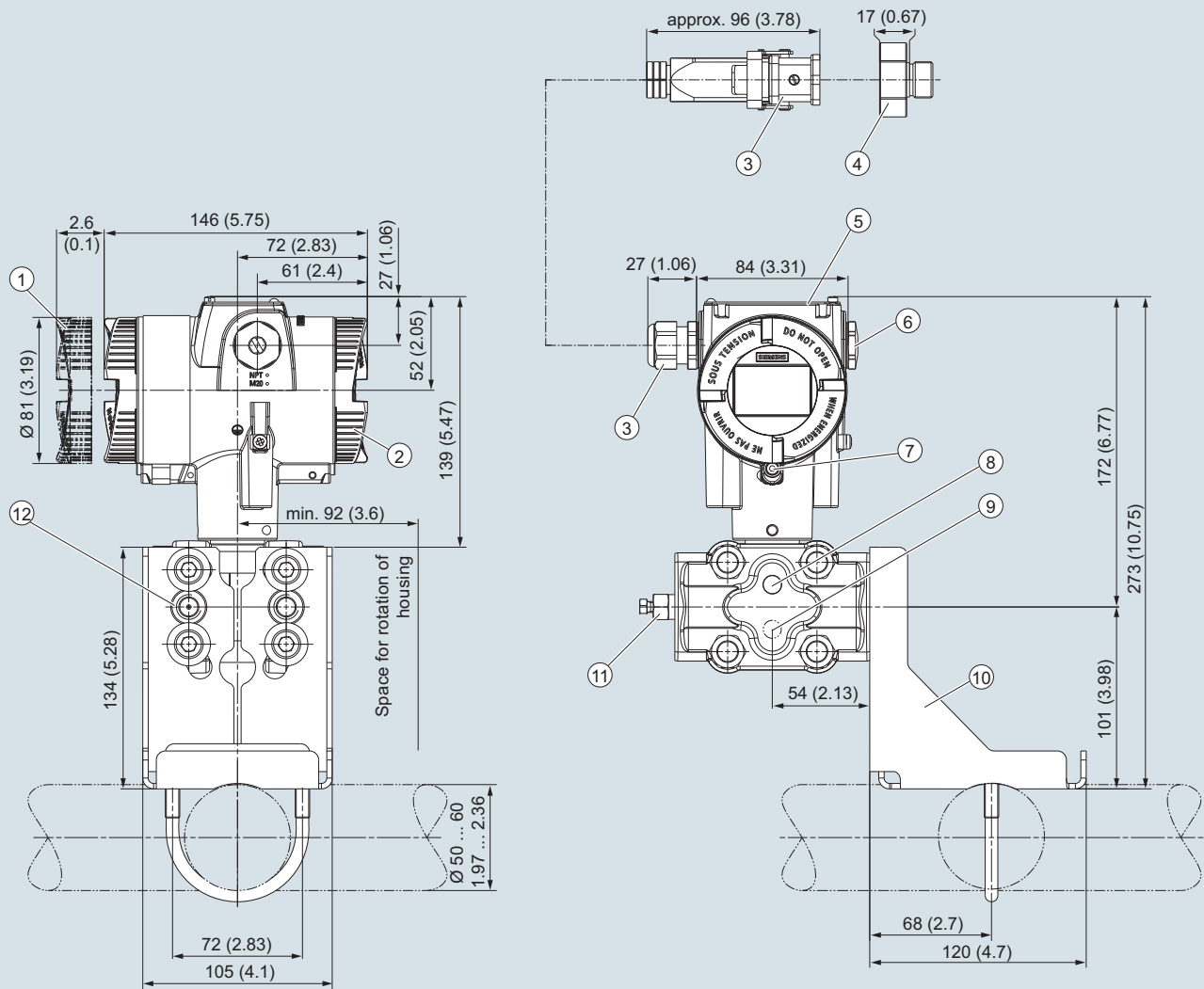
## Pressure Measurement

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

for absolute pressure (differential pressure series)

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### Dimensional drawings



- ① Electronic side, display  
(longer overall length for cover with window)<sup>1)</sup>
- ② Terminal side
- ③ Electrical connection:  
screw gland M20 x 1,5<sup>3)</sup> or screw gland ½-14 NPT or  
Han 7D/Han 8D<sup>2)</sup> device plug or M12 device plug<sup>2)</sup>
- ④ Harting adapter
- ⑤ Cover over buttons and nameplate with general information

- ⑥ Blanking plug
- ⑦ Screw cover - safety bracket  
(only for type of protection "Explosion-proof enclosure")
- ⑧ Lateral venting for liquid measurement (Standard)
- ⑨ Lateral venting for gas measurement (suffix K85)
- ⑩ Mounting bracket (option)
- ⑪ Sealing screw with valve (option)
- ⑫ Process connection: ¼-18 NPT (IEC 61518)

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> 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

## 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		
Span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	1 ... 20 mbar	160 bar	240 bar
	0.1 ... 2 kPa	16 MPa	24 MPa
	0.4019 ... 8.037 inH <sub>2</sub> O	2320 psi	3480 psi
	1 ... 60 mbar	160 bar	240 bar
	0.1 ... 6 kPa	16 MPa	24 MPa
	0.4019 ... 24.11 inH <sub>2</sub> O	2320 psi	3480 psi
	2.5 ... 250 mbar	160 bar	240 bar
	0.2 ... 25 kPa	16 MPa	24 MPa
	1.005 ... 100.5 inH <sub>2</sub> O	2320 psi	3480 psi
	6 ... 600 mbar	160 bar	240 bar
	0.6 ... 60 kPa	16 MPa	24 MPa
	2.41 ... 241.1 inH <sub>2</sub> O	2320 psi	3480 psi
	16 ... 1600 mbar	160 bar	240 bar
	1.6 ... 160 kPa	16 MPa	24 MPa
	6.43 ... 643 inH <sub>2</sub> O	2320 psi	3480 psi
	50 ... 5000 mbar	160 bar	240 bar
	5 ... 500 kPa	16 MPa	24 MPa
	20.09 ... 2009 inH <sub>2</sub> O	2320 psi	3480 psi
	0.3 ... 30 bar	160 bar	240 bar
	0.03 ... 3 MPa	16 MPa	24 MPa
	4.35 ... 435 psi	2320 psi	3480 psi
	2.5 ... 250 mbar	420 bar	630 bar
	0.25 ... 25 kPa	42 MPa	63 MPa
	1.005 ... 100.5 inH <sub>2</sub> 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 <sub>2</sub> O	6092 psi	9137 psi
	16 ... 1600 mbar	420 bar	630 bar
	1.6 ... 160 kPa	42 MPa	63 MPa
	6.43 ... 643 inH <sub>2</sub> O	6092 psi	9137 psi
50 ... 5000 mbar	420 bar	630 bar	
5 ... 500 kPa	42 MPa	63 MPa	
20.09 ... 2009 inH <sub>2</sub> 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 maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a		
- Measuring cell with inert liquid			
	For process temperature -20 °C < $\vartheta$ ≤ +60 °C (-4 °F < $\vartheta$ ≤ +140 °F)	-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a	
	For process temperature 60 °C < $\vartheta$ ≤ +100 °C (max. 85 °C for measuring cell 30 bar with PN 420) (140 °F < $\vartheta$ ≤ +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 · ( $\vartheta$ - 60 °C)/°C 3 kPa a + 2 kPa a · ( $\vartheta$ - 60 °C)/°C 0.44 psi a + 0.29 psi a · ( $\vartheta$ - 140 °F)/°F	
- Measuring cell with FDA-compliant oil	For process temperature -10 °C < $\vartheta$ ≤ +100 °C (-14 °F < $\vartheta$ ≤ +212 °F)	-100% of maximum measuring range or 100 mbar a /10 kPa a /14.5 psi a	
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/process temperature)		
• Start of scale	Between the measuring limits (infinitely adjustable)		

# Pressure Measurement

## 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

Output	HART
Output signal	4 ... 20 mA
<ul style="list-style-type: none"> <li>• Low saturation limit (infinitely adjustable)</li> <li>• High saturation limit (infinitely adjustable)</li> <li>• Ripple (without HART communication)</li> </ul>	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"> <li>• Current transmitter</li> <li>• Failure signal</li> </ul>	3.55 ... 22.8 mA 3.55 ... 22.8 mA
Load	Resistor R [ $\Omega$ ]
<ul style="list-style-type: none"> <li>• Without HART communication</li> <li>• With HART communication</li> </ul>	$R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$ , $U_H$ : 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"> <li>• Linearly increasing or linearly decreasing</li> <li>• Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul>
Physical bus	-
Polarity-independent	-
<b>Measuring accuracy</b>	
Reference conditions	<ul style="list-style-type: none"> <li>• According to EN 60770-1</li> <li>• Rising characteristic curve</li> <li>• Start of scale value 0 bar/kPa/psi</li> <li>• Seal diaphragm stainless steel</li> <li>• Measuring cell with silicone oil filling</li> <li>• Room temperature 25 °C (77 °F)</li> </ul>
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	$r = \text{maximum measuring span/set measuring span or nominal measuring range}$
<ul style="list-style-type: none"> <li>• Linear characteristic</li> </ul>	
- 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 MPa/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 MPa/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"> <li>• Square-rooted characteristic (flow &gt; 50%)</li> </ul>	
- 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 MPa/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) $5 < r \leq 100:$ $\leq (0.004 \cdot r + 0.045)\%$
<ul style="list-style-type: none"> <li>• Square-rooted characteristic (flow 25 ... 50%)</li> </ul>	
- 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 MPa/23.21 psi 5 bar/500 kPa/72.5 psi 30 bar/3 MPa/435 psi	$r \leq 5:$ $\leq 0.13\%$ (SITRANS P320) $\leq 0.008\%$ (SITRANS P420) $5 < r \leq 100:$ $\leq (0.008 \cdot r + 0.09)\%$

# Pressure Measurement

## 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 MPa/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	
30 bar/3 MPa/435 psi	
- 600 mbar/60 kPa/8.7 psi	$\leq (0.0125 \cdot r + 0.0625)\%$ (SITRANS P420)
1600 mbar/160 MPa/23.21 psi	
30 bar/3 MPa/435 psi	

Effect of static pressure

• on the start of scale

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

• on the span

- 20 mbar/2 kPa/0.29 psi	$\leq 0.2\%$ per 70 bar
- 60 mbar/6 kPa/0.87 psi	$\leq 0.1\%$ per 70 bar
250 mbar/25 kPa/3.63 psi	
600 mbar/60 kPa/8.7 psi	
1600 mbar/160 MPa/23.21 psi	
30 bar/3 MPa/435 psi	
- 5 bar/500 kPa/72.5 psi	$\leq 0.15\%$ per 70 bar (SITRANS P320)
	$\leq 0.1\%$ per 70 bar (SITRANS P420)

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °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 MPa/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)

• 20 mbar/2 kPa/0.29 psi	Approx. 0.295 s
• 60 mbar/6 kPa/0.87 psi	Approx. 0.245 s
• 250 mbar/25 kPa/3.63 psi	Approx. 0.195 s
• 600 mbar/60 kPa/8.7 psi	Approx. 0.145 s
1600 mbar/160 MPa/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)

$\leq 0.7$  mbar/0.07 kPa/0.028 inH<sub>2</sub>O per 10° incline (zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V



## Pressure Measurement

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

### for differential pressure and flow

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#### SITRANS P320 / SITRANS P420 for differential pressure and flow

##### Rated conditions

Temperature of medium

• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)
- Measuring cell 30 bar (435 psi), PN 420	-20 ... +85 °C (-4 ... +185 °F)
• Measuring cell with inert oil	-20 ... +100 °C (-4 ... +212 °F)
- Measuring cell 30 bar (435 psi), PN 420	-20 ... +85 °C (-4 ... +185 °F)
• Measuring cell with FDA-compliant oil	-10 ... +100 °C (14 ... +212 °F)
• In conjunction with dust explosion protection	-40 ... +85 °C (-4 ... +185 °F)

Ambient conditions

• Ambient temperature/enclosure	Observe the temperature class in areas subject to explosion hazard.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with silicone oil filling, measuring cell 30 bar (435 psi), PN 420	-20 ... +85 °C (-4 ... +185 °F)
- Measuring cell with inert oil	-20 ... +85 °C (-4 ... +185 °F)
- Measuring cell with FDA-compliant oil	-10 ... +85 °C (14 ... +185 °F)
- Display	-20 ... +80 °C (-4 ... +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21

##### Design

Weight	Approx. 3.9 kg (8.5 lb) with aluminum enclosure Approx. 5.8 kg (12.7 lb) with stainless steel enclosure
Material	
• Wetted parts materials	
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
- Process flanges and sealing plugs	Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
• Non-wetted parts materials	
- Electronics housing	• Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel type plate (1.4404/316L)
- Pressure flange screws	Stainless steel ISO 3506-1 A4-70
- Mounting bracket	Steel, electrogalvanized steel, or stainless steel
Process connection	½-18 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 • Han 7D/Han 8D device plug <sup>1)</sup> • M12 device plug

##### 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	-

# Pressure Measurement

## 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)

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

**For flow only**

For gases of fluid group 1 and liquids of fluid group 1; fulfills the basic safety requirements as per article 3, paragraph 1 (appendix 1); classified as category III, module H conformity evaluation by TÜV Nord

Drinking water

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

Available soon

Available soon

Available soon

Available soon

CRN (Canada)

Available soon

Explosion protection acc. to NEPSI (China)

Available soon

Explosion protection acc. to INMETRO (Brazil)

Available soon

BAM (Germany), oxygen expenditures

Available soon

Explosion protection

- Intrinsic safety "i"

- Marking

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

- Permissible ambient temperature

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

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

- Permissible temperature of measuring medium

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

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

- Connection

To certified intrinsically safe circuits with peak values:

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

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

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

- Effective internal inductance/capacitance

- Flameproof enclosure "d"

- Marking

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

- Permissible ambient temperature

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

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

- Permissible temperature of measuring medium

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

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

- Connection

To a circuit with the operating values:

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

- Dust explosion protection for Zone 20, 21, 22

- Marking

Ex II 1D Ex tb IIIC T120 °C Da

Ex II 2D Ex tb IIIC T120 °C Db

Ex II 3D Ex tc IIIC T120 °C Dc

- Permissible ambient temperature

-40 ... +80 °C (-40 ... +176 °F)

- Permissible temperature of measuring medium

-40 ... +100 °C (-40 ... +212 °F)

- Max. surface temperature

120 °C (248 °F)

- Connection

To a circuit with the operating values:

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

- Dust explosion protection for Zone 20, 21, 22

- Marking

Ex II 1D Ex ia IIIC T120 °C Da

Ex II 2D Ex ib IIIC T120 °C Db

Ex II 3D Ex ic IIIC T120 °C Dc

- Permissible ambient temperature

-40 ... +80 °C (-40 ... +176 °F)

- Permissible temperature of measuring medium

-40 ... +100 °C (-40 ... +212 °F)

- Connection

To certified intrinsically safe circuits with the peak values:

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

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

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

- Effective internal inductance/capacitance

- Type of protection for Zone 2

- Marking

Ex II 3G Ex ec IIC T4/T6 Gc

Ex II 3G Ex ic IIC T4/T6 Gc

- Permissible ambient temperature "ec"

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

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

- Permissible ambient temperature "ic"

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

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

- Permissible temperature of measuring medium

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

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

- "ec" connection

To a circuit with the operating values:

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

- "ic" connection

To certified intrinsically safe circuits with the peak values:

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

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

Effective internal inductance/capacitance:

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

## Pressure Measurement

Transmitters for applications with advanced requirements (Advanced)

SITRANS P320/P420

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### for differential pressure and flow

#### SITRANS P320 / SITRANS P420 for differential pressure and flow

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

#### HART communication

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

# Pressure Measurement

## 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.
<b>Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)</b>	
<b>SITRANS P320</b>	➤ 7MF034 - - - - -
<b>SITRANS P420</b>	➤ 7MF044 - - - - -
➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
<b>Communication</b>	
HART, 4 ... 20 mA	0
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
Neobee oil	4
<b>Maximum measuring span</b>	
20 mbar (8.037 inH <sub>2</sub> O)	B
60 mbar (24.11 inH <sub>2</sub> O)	D
250 mbar (100.5 inH <sub>2</sub> O)	G
600 mbar (241.1 inH <sub>2</sub> O)	H
1 600 mbar (643 inH <sub>2</sub> O)	M
5000 mbar (2009 inH <sub>2</sub> O)	P
30 bar (435 psi)	R
<b>Process connection</b>	
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
<b>Wetted parts materials: Process connection, seal diaphragm</b>	
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
Tantalum/tantalum (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 (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 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	8
<b>Non-wetted parts materials</b>	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
<b>Enclosure</b>	
Dual chamber device	5
<b>Type of protection</b>	
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
<b>Electrical connections/cable entries</b>	
Thread for cable gland	
• 2 x M20 x 1.5	F
• 2 x ½-14 NPT	M

## Pressure Measurement

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

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### for differential pressure and flow

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

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for differential pressure and flow

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	Article No.
<b>Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)</b>	
<b>SITRANS P320</b>	↗ 7MF035
<b>SITRANS P420</b>	↗ 7MF045
↗ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
<b>Communication</b>	
HART, 4 ... 20 mA	0
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
Neobee oil	4
<b>Maximum measuring span</b>	
250 mbar (100.5 inH <sub>2</sub> O)	G
600 mbar (241.1 inH <sub>2</sub> O)	H
1 600 mbar (643 inH <sub>2</sub> O)	M
5000 mbar (2009 inH <sub>2</sub> O)	P
30 bar (435 psi)	R
<b>Process connection</b>	
Oval flange, mounting thread: 7/16"-20 UNF (IEC 61518)	L
Oval flange, mounting thread: M12 (PN 420) (DIN 19213)	M
Oval flange, mounting thread: 7/16"-20 UNF (IEC 61518) with lateral ventilation	N
Oval flange, mounting thread: M12 (PN 420) (DIN 19213) with lateral ventilation	P
Version for diaphragm seal with mounting thread 7/16"-20 UNF (IEC 61518)	V
Version for diaphragm seal with mounting thread M10 (DIN 19213)	W
Version for diaphragm seal (level and capillary) with mounting thread 7/16"-20 UNF (IEC 61518)	X
<b>Wetted parts materials: Process connection, seal diaphragm</b>	
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
Tantalum/tantalum	4
Monel 00/2.4360, Monel 400/2.4360	6
Stainless steel 316L/1.4404, gold-plated	8
<b>Non-wetted parts materials</b>	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
<b>Enclosure</b>	
Dual chamber device	5
<b>Type of protection</b>	
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
<b>Electrical connections/cable entries</b>	
Thread for cable gland	
• 2 x M20 x 1.5	F
• 2 x 1/2"-14 NPT	M
<b>Local operation/display</b>	
Without display (cover closed)	0
With display (cover closed)	1
With display (cover with glass pane)	2

## Pressure Measurement

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

for differential pressure and flow

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### Selection and ordering data

Options	Order code	Options	Order code
Add "-Z" to article no. and specify order code.			
<b>Cable glands included</b>		<b>Device options</b>	
Plastic	<b>A00</b>	PDF file with device settings	<b>D10</b>
Metal	<b>A01</b>	Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	<b>D20</b>
Stainless steel	<b>A02</b>	FVMQ enclosure sealing	<b>D21</b>
Stainless steel 316L/1.4404	<b>A03</b>	IP66/IP68 degree of protection (not for M12 and Han device plugs)	<b>D30</b>
CMP, for XP devices	<b>A10</b>	TAG label empty	<b>D40</b>
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A11</b>	Without labeling of the measuring range on the TAG label	<b>D41</b>
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	<b>A12</b>	Stainless steel Ex plate 1.4404/316L	<b>D42</b>
<b>Han device plug mounted left</b>		Increase of pressure stage from PN 420 to PN 500	<b>D50</b>
Han 7D device plug (plastic, straight)	<b>A30</b>	Overvoltage protection up to 6 kV (external)	<b>D71</b>
Han 7D device plug (plastic, angled)	<b>A31</b>	Adhesive labels on transport packaging (supplied by customer)	<b>D90</b>
Han 7D device plug (metal, straight)	<b>A32</b>		
Han 7D device plug (metal, angled)	<b>A33</b>	<b>General approval without Ex approval</b>	
Han 8D device plug (plastic, straight)	<b>A34</b>	Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Han 8D device plug (plastic, angled)	<b>A35</b>	Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
Han 8D device plug (metal, straight)	<b>A36</b>	CSA	<b>E06</b>
Han 8D device plug (metal, angled)	<b>A37</b>	EAC	<b>E07</b>
<b>Cable socket included</b>		FM	<b>E08</b>
Plastic, for Han 7D/8D device plugs	<b>A40</b>	KCC	<b>E09</b>
Metal, for Han 7D/8D device plugs	<b>A41</b>	UL	<b>E10</b>
<b>M12 device plug mounted left</b>		<b>Explosion protection approvals</b>	
Stainless steel, without cable socket	<b>A62</b>	ATEX (Europe)	<b>E20</b>
Stainless steel, with cable socket	<b>A63</b>	CSA (USA and Canada)	<b>E21</b>
<b>Cable entry/connector mounting</b>		FM (USA and Canada)	<b>E22</b>
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	<b>A90</b>	IECEx (Worldwide)	<b>E23</b>
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	<b>A91</b>	EACEx (GOST-R, -K, -B)	<b>E24</b>
Cable gland/connector mounted left	<b>A97</b>	INMETRO (Brazil)	<b>E25</b>
Cable gland/connector mounted on right	<b>A99</b>	KCs (Korea)	<b>E26</b>
<b>Nameplate labeling</b>		NEPSI (China)	<b>E27</b>
German (bar)	<b>B11</b>	PESO (India)	<b>E28</b>
French (bar)	<b>B12</b>	TIIS Hazardous (Japan)	<b>E29</b>
Spanish (bar)	<b>B13</b>	UKR Sepro (Ukraine)	<b>E30</b>
Italian (bar)	<b>B14</b>	ATEX (Europe) and IECEx (Worldwide)	<b>E47</b>
Chinese (bar)	<b>B15</b>	CSA (Canada) and FM (USA)	<b>E48</b>
Russian (bar)	<b>B16</b>	ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	<b>E49</b>
English (psi)	<b>B20</b>	<b>Marine approvals</b>	
Chinese (Pa)	<b>B35</b>	DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
<b>Certificates</b>		LR (Lloyds Register)	<b>E51</b>
Quality test certificate, 5-point factory calibration (IEC 60770-2)	<b>C11</b>	BV (Bureau Veritas)	<b>E52</b>
Acceptance certificate (EN 10204-3.1) - Material of pressurized and wetted parts	<b>C12</b>	ABS (American Bureau of Shipping)	<b>E53</b>
Test report - NACE (MR 0103-2012 and MR 0175-2009)	<b>C13</b>	KR (Korean Register of Shipping)	<b>E56</b>
Test report (EN 10204-2.2) - Wetted parts	<b>C14</b>	RINA (Registro Italiano Navale)	<b>E57</b>
Acceptance certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	<b>C15</b>	CCS (China Classification Society)	<b>E58</b>
<b>Certificates for functional safety</b>		<b>Country-specific approvals</b>	
Functional safety (IEC 61508) - SIL2/3	<b>C20</b>	CRN approval Canada (Canadian Registration Number)	<b>E60</b>

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for differential pressure and flow

1

Options	Order code
<b>Special approvals</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
Dual seal	<b>E81</b>
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	<b>E83</b>
NSF61 (drinking water)	<b>E84</b>
ACS (drinking water)	<b>E85</b>
<b>Mounting bracket</b>	
Steel, galvanized	<b>H01</b>
Stainless steel 1.4301/304	<b>H02</b>
Stainless steel 1.4404/316L	<b>H03</b>
<b>Process flanges; screw plug with vent valve</b>	
Welded in on right	<b>J08</b>
Welded in on left	<b>J09</b>
Glued in on right	<b>J10</b>
Glued in on left	<b>J11</b>
<b>Flange connections with flange EN 1092-1</b>	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J70</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J71</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J72</b>
• DN 15 PN 40, stainless steel 1.4571/316Ti	<b>J78</b>
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	<b>J73</b>
• DN 50 PN 40, stainless steel 1.4571/316Ti	<b>J74</b>
• DN 80 PN 40, stainless steel 1.4571/316Ti	<b>J75</b>
<b>Flange connection options</b>	
Flange connection and temperature extension	<b>J76</b>
Flange connection with epoxy resin coating	<b>J77</b>
<b>Process flanges; special materials</b>	
Reserved for 7MF7: without process flanges, without screws, without gaskets	<b>K00</b>
Process flange material alloy C4/2.4610	<b>K01</b>
Process flange material Monel 400/2.4360	<b>K02</b>
Process connection material PVDF, on the side ½-14 NPT	<b>K05</b>
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	<b>K06</b>
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	<b>K07</b>
<b>Process flanges; process connection option</b>	
Process flange with process connection G½ welded on	<b>K20</b>
Process connection (oval flange) NAM (ASTAVA)	<b>K21</b>
<b>Process flanges chambered with gaskets</b>	
1x chambered, graphite	<b>K40</b>
1x chambered, PTFE	<b>K41</b>
2x chambered, PTFE	<b>K42</b>
<b>Process flanges, gaskets (instead of standard gaskets FKM (FPM))</b>	
O-ring, process flanges, PTFE	<b>K50</b>
O-ring, process flanges, FEP (with silicone core, approved for food)	<b>K51</b>
O-ring, process flanges, FFKM (FFPM)	<b>K52</b>
O-ring, process flanges, NBR	<b>K53</b>
O-ring, process flanges, EPDM	<b>K54</b>

Options	Order code
<b>Process flange options</b>	
Process flanges for vertical differential pressure lines (half process flange)	<b>K81</b>
Process flanges (+) - side front	<b>K82</b>
Process flange screws, process flange nuts, material Monel 400/2.4360	<b>K83</b>
Valve ¼-18 NPT, material same as process flanges	<b>K84</b>
Valve mounted on the side, measured medium: Gas	<b>K85</b>
Oval flange enclosed, gasket PTFE + mounting screws	<b>K86</b>
<b>Pneumatic blocks</b>	
With mounted pneumatic block (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in test report (EN 10204-2.2)	<b>U01</b>
With mounted pneumatic block (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)	<b>U02</b>
With mounted pneumatic block (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in test report (EN 10204-2.2)	<b>U03</b>
With mounted pneumatic block (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in test report (EN 10204-2.2)	<b>U04</b>



## Pressure Measurement

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

for differential pressure and flow

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### Selection and ordering data

<i>Customer-specific device settings</i>	Order code
Add "-Z" to article no., specify order code and plain text or drop-down list selection.	
<b>Measuring span</b> <b>Start of scale value (max. 5 characters),</b> <b>full scale value (max. 5 characters),</b> <b>unit [mbar, bar, kPa, MPa, psi, ...],</b> <b>example: -0.5 ... 10.5 psi</b>  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 <sup>2</sup> , kg/cm <sup>2</sup> , kgf/cm <sup>2</sup> , inH <sub>2</sub> O, inH <sub>2</sub> O (4°C), ftH <sub>2</sub> O, mmH <sub>2</sub> O, mmH <sub>2</sub> O (4°C), mH <sub>2</sub> O (4°C), mmHg, inHg, atm, torr	Y01
<b>Square-rooted characteristic [VSLN2, MSLN2],</b> <b>example: VSLN2</b>  Drop-down list: VSLN2, MSLN2	Y02
<b>TAG</b> <b>(on stainless steel plate and device parameters,</b> <b>max. 32 characters)</b>  Input field: Free text, max. 32 characters	Y15
<b>Measuring point description</b> <b>(on stainless steel plate and device parameters,</b> <b>max. 32 characters)</b>  Input field: Free text, max. 32 characters	Y16
<b>TAG short</b> <b>(device parameters, max. 8 characters)</b>  Input field: Free text, max. 8 characters	Y17
<b>Local display</b> <b>[Pressure, Percent], reference [None, Absolute, Rela-]</b> <b>tive], example: Pressure gauge</b>  Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	Y21
<b>Local display</b> <b>Scaling with standard units</b> <b>[m<sup>3</sup>/s, l/s, m, inch, ...], example 1 ... . 5 m<sup>3</sup>/s</b>  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 <sup>3</sup> , l, hl, in <sup>3</sup> , ft <sup>3</sup> , yd <sup>3</sup> , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm <sup>3</sup> , NI, m <sup>3</sup> /sec, m <sup>3</sup> /h, m <sup>3</sup> /d, l/sec, l/min, l/h, Ml/d, ft <sup>3</sup> /sec, ft <sup>3</sup> /h, ft <sup>3</sup> /d, SCF/min, SCF/h, NI/h, Nm <sup>3</sup> /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
<b>Local display</b> <b>Scaling with user-specific units (max. 12 characters),</b> <b>example 1 ... 5 m</b>  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
<b>Saturation limits instead of 3.8 ... 20.5 mA,</b> <b>example: 3.8 ... 22.0 mA</b>  Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	Y30
<b>Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]</b>  Drop-down list: 3.75; 21.75; 22.5; 22.6	Y31
<b>Damping in seconds instead of 2 s (0.0 ... 100.0 s)</b>  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
<b>ID number of special version</b>  Input field: max. 4 characters and only natural numbers from 0 ... 9999	Y99

# Pressure Measurement

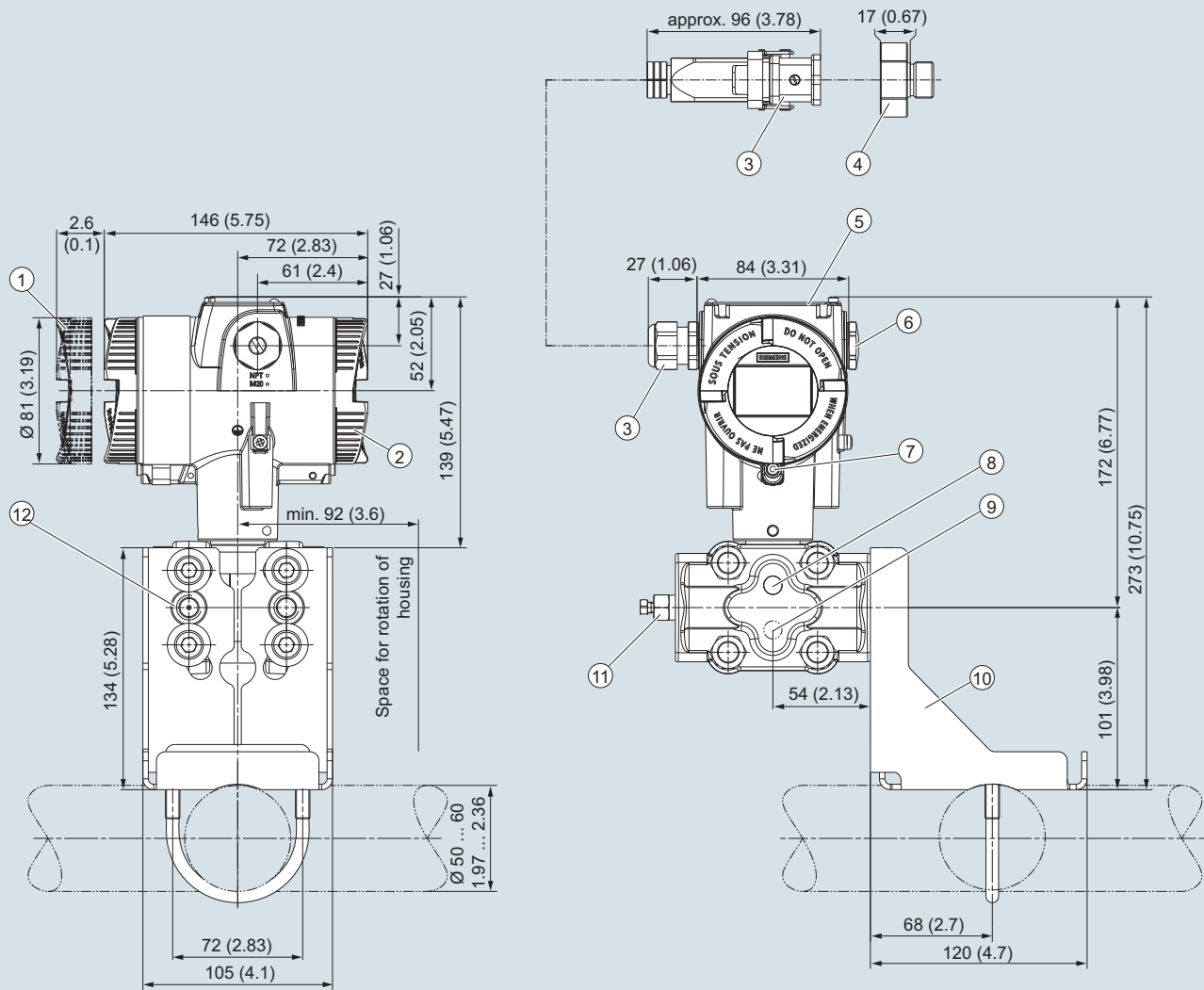
## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for differential pressure and flow

1

## Dimensional drawings



- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>① Electronic side, display (longer overall length for cover with window)<sup>1)</sup></li> <li>② Terminal side</li> <li>③ Electrical connection: screw gland M20 x 1,5<sup>3)</sup> or screw gland ½-14 NPT or Han 7D/Han 8D<sup>2)</sup> device plug or M12 device plug<sup>2)</sup></li> <li>④ Harting adapter</li> <li>⑤ Cover over buttons and nameplate with general information</li> </ul> | <ul style="list-style-type: none"> <li>⑥ Blanking plug</li> <li>⑦ Screw cover - safety bracket (only for type of protection "Explosion-proof enclosure")</li> <li>⑧ Lateral venting for liquid measurement (Standard)</li> <li>⑨ Lateral venting for gas measurement (suffix K85)</li> <li>⑩ Mounting bracket (option)</li> <li>⑪ Sealing screw with valve (option)</li> <li>⑫ Process connection: ¼-18 NPT (IEC 61518)</li> </ul> |
|---|--|

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"

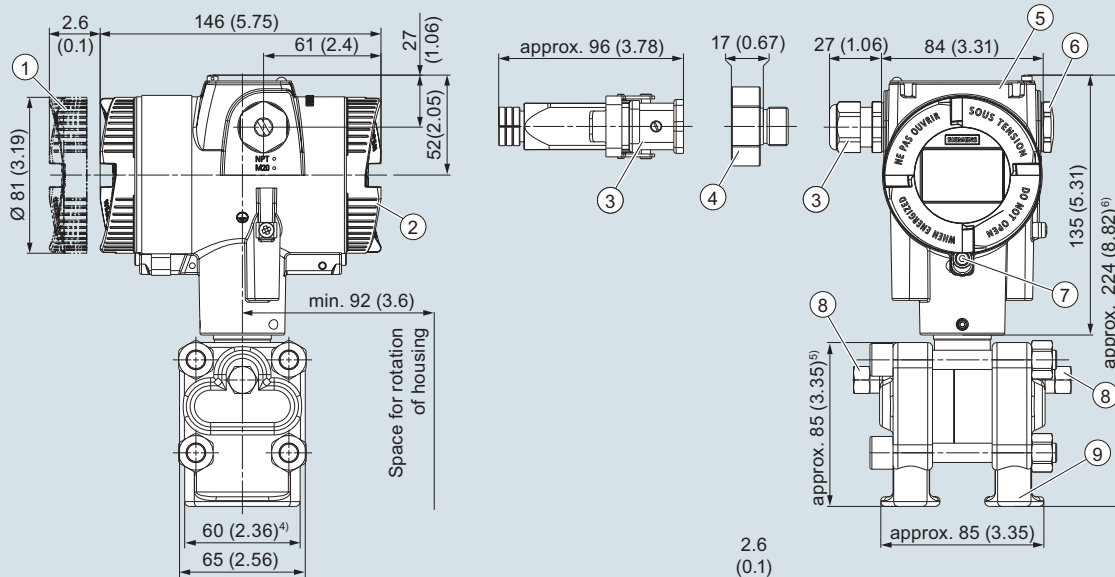
SITRANS P320/P420 pressure transmitter for differential pressure and flow, dimensions in mm (inch)

## Pressure Measurement

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

for differential pressure and flow

1



- |   |  |
|---|--|
| <p>① Electronic side, display<br/>(longer overall length for cover with window)<sup>1)</sup></p> <p>② Terminal side</p> <p>③ Electrical connection:<br/>screw gland M20 x 1,5<sup>3)</sup> or screw gland ½-14 NPT or<br/>Han 7D/Han 8D<sup>2) 3)</sup> device plug or M12 device plug<sup>2) 3)</sup></p> <p>④ Harting adapter</p> | <p>⑤ Cover over buttons and nameplate<br/>with general information</p> <p>⑥ Blanking plug</p> <p>⑦ Screw cover - safety bracket<br/>(only for type of protection "Explosion-proof enclosure")</p> <p>⑧ Sealing screw with valve (option)</p> <p>⑨ Process connection: ¼-18 NPT (IEC 61518)</p> |
|---|--|

<sup>1)</sup> In addition, allow approx. 22 mm (0.87 inch) for the thread length when removing the covers

<sup>2)</sup> Not with type of protection "Explosion-proof enclosure"

<sup>3)</sup> Not with type of protection "FM + CSA" [is + XP]"

<sup>4)</sup> 74 mm (2.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

<sup>5)</sup> 91 mm (3.6 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

<sup>6)</sup> 226 mm (8.9 inch) for PN ≥ 420 (MAWP ≥ 6092 psi)

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

## Technical specifications

### SITRANS P320 / SITRANS P420 for level

#### Input

Measured variable	Level		
Span (infinitely adjustable) and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	25 ... 250 mbar	See "Mounting flange"	
	2.5 ... 25 kPa		
	10 ... 100.5 inH <sub>2</sub> O		
	25 ... 600 mbar		
	2.5 ... 60 kPa		
	10 ... 241 inH <sub>2</sub> O		
	53 ... 1600 mbar		
	5.3 ... 160 kPa		
	21 ... 643 inH <sub>2</sub> O		
	166 ... 5000 mbar		
	16.6 ... 500 kPa		
	2.41 ... 72.5 psi		
Measuring limits			
• Low measuring limit			
- Measuring cell with silicone oil filling	-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange		
- Measuring cell with inert oil	-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange		
- Measuring cell with FDA-compliant oil	-100% of max. measuring range or 100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of max. span		
• Start of scale	Between the measuring limits (infinitely adjustable)		

#### Output

Output signal	<b>HART</b>
• 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
	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 [ $\Omega$ ]
• 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"> <li>• Linearly increasing or linearly decreasing</li> <li>• Linear increase or decrease or according to the square root (only for differential pressure and flow)</li> </ul>
Physical bus	-
Polarity-independent	-

#### Measuring accuracy

Reference conditions	<ul style="list-style-type: none"> <li>• According to EN 60770-1</li> <li>• Rising characteristic curve</li> <li>• Start of scale value 0 bar/kPa/psi</li> <li>• Seal diaphragm stainless steel</li> <li>• Measuring cell with silicone oil filling</li> <li>• Room temperature 25 °C (77 °F)</li> </ul>
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	$r = \text{maximum measuring span/set measuring span or nominal measuring range}$
• Linear characteristic	
- 250 mbar/25 kPa/3.6 psi	$r \leq 5:$
- 600 mbar/60 kPa/8.7 psi	$\leq 0.065\%$ (SITRANS P320)
- 1600 mbar/160 kPa/23.21 psi	$\leq 0.004\%$ (SITRANS P420)
- 5 bar/500 kPa/72.5 psi	$5 < r \leq 10:$
	$\leq (0.004 \cdot r + 0.045)\%$

## Pressure Measurement

### Transmitters for applications with advanced requirements (Advanced) SITRANS P320/P420

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#### for level

#### SITRANS P320 / SITRANS P420 for level

Influence of ambient temperature<sup>1)</sup>  
in % per 28 °C (50 °F)

- SITRANS P320
  - 250 mbar/25 kPa/3.6 psi  $\leq (0.025 \cdot r + 0.125)\%$
  - 600 mbar/60 kPa/8.7 psi
  - 1600 mbar/160 kPa/23.21 psi
  - 5 bar/500 kPa/72.5 psi
- SITRANS P420
  - 250 mbar/25 kPa/3.6 psi  $\leq (0.025 \cdot r + 0.625)\%$
  - 5 bar/500 kPa/72.5 psi
  - 600 mbar/60 kPa/8.7 psi  $\leq (0.125 \cdot r + 0.625)\%$
  - 1600 mbar/160 kPa/23.21 psi

Effect of static pressure

- on the start of scale
  - 50 mbar/25 kPa/3.63 psi  $\leq (0.1 \cdot r)\%$  per nominal pressure
  - 600 mbar/60 kPa/8.70 psi
  - 1600 mbar/160 kPa/23.21 psi
  - 5 bar/500 kPa/72.52 psi  $\leq (0.15 \cdot r)\%$  per nominal pressure
- on the span  $\leq (0.1 \cdot r)\%$  per nominal pressure

Long-term stability at  $\pm 30$  °C ( $\pm 54$  °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) Approx. 0.2 s

Influence of mounting position Depends on the fill fluid in the mounting flange

Effect of auxiliary power (in % per voltage change) 0.005% per 1 V

#### Rated conditions

Temperature of medium

Measuring cell with silicone oil filling

- High-pressure side: See "Mounting flange"
- Low-pressure side: -40 ... +100 °C (-40 ... +212 °F)

Ambient conditions

- Ambient temperature/enclosure

- Measuring cell with silicone oil filling
- Display

- Storage temperature
- Climatic class in accordance with IEC 60721-3-4
- Degree of protection

- According to IEC 60529
- According to NEMA 250

- Electromagnetic compatibility

- Emitted interference and interference immunity

Always consider the assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection.

-40 ... +85 °C (-40 ... +185 °F)

-20 ... +80 °C (-4 ... +176 °F)

-50 ... +85 °C (-58 ... +185 °F)

4K4H

IP66, IP68

Type 4X

According to IEC 61326 and NAMUR NE 21

Vibration resistance

- Reference conditions

- General operating conditions

- Oscillations (sine) IEC 60068-2-6

10 ... 58 Hz, 0.3 mm (0.01 inch)

58 ... 500 Hz, 20 m/s<sup>2</sup> (65.62 ft/s<sup>2</sup>)

1 octave/min

5 cycles/axis

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

250 m/s<sup>2</sup> (820 ft/s<sup>2</sup>)

6 ms

2000 shocks/axis

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

10 ... 200 Hz; 1 (m/s<sup>2</sup>)/Hz (3.28 (ft/s<sup>2</sup>)/Hz)

200 ... 500 Hz; 0.3 (m/s<sup>2</sup>)/Hz (0.98 (ft/s<sup>2</sup>)/Hz)

4 hours/axle

- Rated conditions for marine applications

- IEC 60068-2-6

- DNVGL-CG-0339, clause 6

- Lloyd's Register Test Specification Number 1, section 12.

- Bureau Veritas Pt C, Ch 3, Sec 6, Table 1, No 7

2 ... 25 Hz, 1.6 mm (0.06 inch)

25 ... 100 Hz, 40 m/s<sup>2</sup> (131.23 ft/s<sup>2</sup>)

1 octave/min

# Pressure Measurement

## 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 flange locking screws

Stainless steel, mat. no. 1.4408

Screw plug

Stainless steel ISO 3506-1 A4-70

O-ring

FPM (Viton)

- Non-wetted parts materials

- Electronics housing

- Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M
- Standard: Powder coating with polyurethane
- Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane
- Stainless steel type plate (1.4404/316L)

## Pressure flange screws

Stainless steel ISO 3506-1 A4-70

## Measuring cell filling

- Mounting flange fill fluid

Silicone oil

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
- Han 7D/Han 8D device plug<sup>2)</sup>
- M12 device plug

**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<sub>H</sub>**

## Terminal voltage on pressure transmitter

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

## Ripple

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

## Noise

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

## Auxiliary power

–

## Separate supply voltage

–

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced) SITRANS P320/P420

1

### for level

#### SITRANS P320 / SITRANS P420 for level

##### Certificates and approvals

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

Drinking water

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

CRN (Canada)

Explosion protection acc. to NEPSI (China)

Explosion protection acc. to INMETRO (Brazil)

BAM (Germany), oxygen expenditures

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 Zone 20, 21, 22

- Marking

- Permissible ambient temperature

- Permissible temperature of measuring medium

- Max. surface temperature

- Connection

- Dust explosion protection for Zone 20, 21, 22

- Marking

- Permissible ambient temperature

- Permissible temperature of measuring medium

- Connection

- Effective internal inductance/capacitance

- Type of protection for Zone 2

- Marking

- Permissible ambient temperature "ec"

- Permissible ambient temperature "ic"

- Permissible temperature of measuring medium

- "ec" connection

- "ic" connection

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

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

Available soon

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 1D Ex ia IIIC T120 °C Da

Ex II 2D Ex ib IIIC T120 °C Db

Ex II 3D Ex ic IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

To certified intrinsically safe circuits with the peak values:

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

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

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

Ex II 3G Ex ec IIC T4/T6 Gc

Ex II 3G Ex ic IIC T4/T6 Gc

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

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

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

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

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

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

To a circuit with the operating values:

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

To certified intrinsically safe circuits with the peak values:

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

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

Effective internal inductance/capacitance:

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

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for level

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**SITRANS P320 / SITRANS P420 for level**

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

1) Specification only applies to the basic unit. The remote seal error must be considered additively.

2) 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
<ul style="list-style-type: none"> <li>Acc. to EN 1092-1           <ul style="list-style-type: none"> <li>- DN 80</li> <li>- DN100</li> </ul> </li> <li>According to ASME B16.5           <ul style="list-style-type: none"> <li>- 3 inch</li> <li>- 4 inch</li> </ul> </li> </ul>	PN 40 PN 16, PN 40  Class 150, class 300 Class 150, class 300



# Pressure Measurement

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

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for level

## Selection and ordering data

	Article No.
<b>Pressure transmitters for level</b>	
<b>SITRANS P320</b>	➤ 7MF036 - - - - -
<b>SITRANS P420</b>	➤ 7MF046 - - - - -
➤ Click on the Article no. for the online configuration in the PIA Life Cycle Portal.	
<b>Communication</b>	
HART, 4 ... 20 mA	0
<b>Measuring cell filling</b>	
Silicone oil	1
Inert liquid	3
Neobee oil	4
<b>Maximum measuring span</b>	
250 mbar (100.5 inH <sub>2</sub> O)	G
600 mbar (241 inH <sub>2</sub> O)	H
1 600 mbar (643 inH <sub>2</sub> O)	M
5000 mbar (72.5 psi)	P
<b>Process connection</b>	
Version for diaphragm seal with mounting thread $7/16$ -20 UNF (IEC 61518)	V
<b>Wetted parts materials: Process connection, seal diaphragm</b>	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404	0
<b>Non-wetted parts materials</b>	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
<b>Enclosure</b>	
Dual chamber device	5
<b>Type of protection</b>	
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
<b>Electrical connections/cable entries</b>	
Thread for cable gland	
• 2 x M20 x 1.5	F
• 2 x 1/2-14 NPT	M
<b>Local operation/display</b>	
Without display (cover closed)	0
With display (cover closed)	1
With display (cover with glass pane)	2

### Selection and ordering data

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

Options	Order code
<b>Device options</b>	
PDF file with device settings	<b>D10</b>
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	<b>D20</b>
FVMQ enclosure sealing	<b>D21</b>
IP66/IP68 degree of protection (not for M12 and Han device plugs)	<b>D30</b>
TAG label empty	<b>D40</b>
Without labeling of the measuring range on the TAG label	<b>D41</b>
Stainless steel Ex plate 1.4404/316L	<b>D42</b>
Increase of pressure stage from PN 420 to PN 500	<b>D50</b>
Overvoltage protection up to 6 kV (external)	<b>D71</b>
Adhesive labels on transport packaging (supplied by customer)	<b>D90</b>
<b>General approval without Ex approval</b>	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	<b>E00</b>
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	<b>E01</b>
CSA	<b>E06</b>
EAC	<b>E07</b>
FM	<b>E08</b>
KCC	<b>E09</b>
UL	<b>E10</b>
<b>Explosion protection approvals</b>	
ATEX (Europe)	<b>E20</b>
CSA (USA and Canada)	<b>E21</b>
FM (USA and Canada)	<b>E22</b>
IECEx (Worldwide)	<b>E23</b>
EACEx (GOST-R, -K, -B)	<b>E24</b>
INMETRO (Brazil)	<b>E25</b>
KCs (Korea)	<b>E26</b>
NEPSI (China)	<b>E27</b>
PESO (India)	<b>E28</b>
TIIS Hazardous (Japan)	<b>E29</b>
UKR Sepro (Ukraine)	<b>E30</b>
ATEX (Europe) and IECEx (Worldwide)	<b>E47</b>
CSA (Canada) and FM (USA)	<b>E48</b>
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA)	<b>E49</b>
<b>Marine approvals</b>	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	<b>E50</b>
LR (Lloyds Register)	<b>E51</b>
BV (Bureau Veritas)	<b>E52</b>
ABS (American Bureau of Shipping)	<b>E53</b>
KR (Korean Register of Shipping)	<b>E56</b>
RINA (Registro Italiano Navale)	<b>E57</b>
CCS (China Classification Society)	<b>E58</b>
<b>Country-specific approvals</b>	
CRN approval Canada (Canadian Registration Number)	<b>E60</b>

## Pressure Measurement

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

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### for level

Options	Order code
<b>Special approvals</b>	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	<b>E80</b>
Dual seal	<b>E81</b>
WRC / WRAS (drinking water); only with pressure cap O-rings made of EPDM	<b>E83</b>
NSF61 (drinking water)	<b>E84</b>
ACS (drinking water)	<b>E85</b>

### Selection and ordering data

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

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for level

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Selection and Ordering data		Article No.	Order code
<b>Diaphragm seal</b>		7MF0814 -	03 - 0
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.			
<b>Connecting standard EN 1092-1</b>			
<b>Nominal diameter</b>	<b>Nominal pressure</b>		
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	
<b>Connecting standard ASME B16.5</b>			
<b>Nominal diameter</b>	<b>Nominal pressure</b>		
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	
<b>Connecting standard J.I.S.</b>			
<b>Nominal diameter</b>	<b>Nominal pressure</b>		
DN 50	10K	2ES	
	20k	2ET	
	50K	2EU	
DN 80	10K	2GS	
	20k	2GT	
	50K	2GU	
DN 100	10K	2HS	
	20k	2HT	
	50K	2HU	
Other version		9AA	H1Y
Add Order code and plain text			

Selection and Ordering data		Article No.	Order code
<b>Diaphragm seal</b>		7MF0814 -	03 - 0
Flange type design, direct connected to a SITRANS P transmitter for level 7MF03../7MF04.. (order separately) Scope of delivery: 1 off			
<b>Filling liquid</b>			
Silicone oil M5		A	
Silicone oil M50		B	
High-temperature oil		C	
Halocarbon oil		D	
Food-grade oil (FDA listed)		E	
Other version, add Order code and plain text:		Z	P1Y
Filling liquid: ...			
<b>Wetted parts materials</b>			
Stainless steel 316L			
• Without coating		A	
• With PFA coating		D	
• With PTFE coating		E0	
• With ECTFFE coating		F	
Monel 400, 2.4360		G	
Hastelloy C276, 2.4819		J	
Tantalum		K	
Titanium, 3.7035		L0	
Nickel 201		M0	
Diaphragm Duplex, 1.4462		Q	
Diaphragm plus flange Duplex, 1.4462		R	
Stainless steel 316L with gold coating		S0	
Hastelloy C4, 2.4610		U0	
Hastelloy C22, 2.4602		V0	
Other version		Z8	Q1Y
Add Order code and plain text			
<b>Extension length</b>			
• without		0	
• 50 mm (2")		1	
• 100 mm (4")		2	
• 150 mm (6")		3	
• 200 mm (8")		4	
• 250 mm (10")		5	
Other version		Z8	Q1Y
Add Order code and plain text			

## Pressure Measurement

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

for level

1

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

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

# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for level

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Selection and Ordering data	Order code
<b>Further designs</b>	
Add "-Z" to Article No. and specify Order code.	
<b>Factory certificates</b>	
Quality inspection certificate (Five-step factory calibration) to IEC 60770-2	<b>C11</b>
Inspection certificate to EN 10204-3.1 - material of body and wetted parts	<b>C12</b>
Manufacturer's declaration acc. to NACE (MR 0103-2012 and MR 0175-2009) (only together with seal diaphragm made of Hastelloy and stainless steel)	<b>C13</b>
Inspection certificate (EN 10204-3.1) - PMI test of pressure containing and wetted parts	<b>C15</b>
Certificate of FDA-approved fill oil (to EN10204-2.2)	<b>C17</b>
Functional safety (SIL2/3) Devices suitable for use according to IEC 61508 and IEC 61511 (Includes SIL conformity declaration)	<b>C20</b>
<b>Accessories</b>	
Spark arrester (for differential pressure and level transmitter)	<b>D62</b>
Low-temperature version (for Silicon Oil M50 only)	<b>D67</b>
<b>Negative pressure services</b>	
Certification acc. to NACE MR-0103	<b>D83</b>
Includes acceptance test certificate 3.1 acc. to EN 10204 (only for wetted parts made of stainless steel 1.4404/316L and Hastelloy C276)	<b>D88</b>
<b>General product approvals without explosion proof approvals</b>	
Oil-and grease-free cleaned version (for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil max. temperature 60 °C and max. pressure 50 bar)	<b>E80</b>
Oil-and grease-free cleaned version (not for O <sub>2</sub> -appl. including certificate EN10204-2.2 (only with fill fluid Halocarbon oil)	<b>E87</b>
<b>Sealing surface</b>	
Sealing surface smooth, form B2/EN1092-1 resp. RFSF/ANSI B16.5 (wetted parts 316L only)	<b>M50</b>
Sealing surface groove to EN1092-1, form D (instead of sealing surface B1, wetted parts 316L only)	<b>M54</b>
Sealing surface RJF (groove) to ASME B16.5 (instead of sealing surface RF 125...250AA, wetted parts 316L only)	<b>M64</b>
Sealing surface with tongue to EN1092-1, form C (wetted parts 316L only)	
• DN 40	<b>M71</b>
• DN 50	<b>M72</b>
• DN 80	<b>M73</b>
• DN 100	<b>M74</b>
• DN 125	<b>M75</b>
Sealing surface with spigot to EN1092-1, form E (wetted parts 316L only)	
• DN 40	<b>M77</b>
• DN 50	<b>M78</b>
• DN 80	<b>M79</b>
• DN 100	<b>M80</b>
• DN 125	<b>M81</b>
Sealing surface with recess to EN1092-1, form F (wetted parts 316L only)	
• DN 50	<b>M84</b>
• DN 80	<b>M85</b>
• DN 100	<b>M86</b>
• DN 125	<b>M87</b>

Selection and Ordering data	Order code
<b>Further designs</b>	
Add "-Z" to Article No. and specify Order code.	
<b>Sealing surface</b>	
Operating Temperature; Lower range value ... °C (°F), upper range value ... °C (°F)	<b>Y10</b>
Static pressure: ... bar (psi)	<b>Y11</b>
Customer specific extension length (enter required length in plain text)	<b>Y44</b>

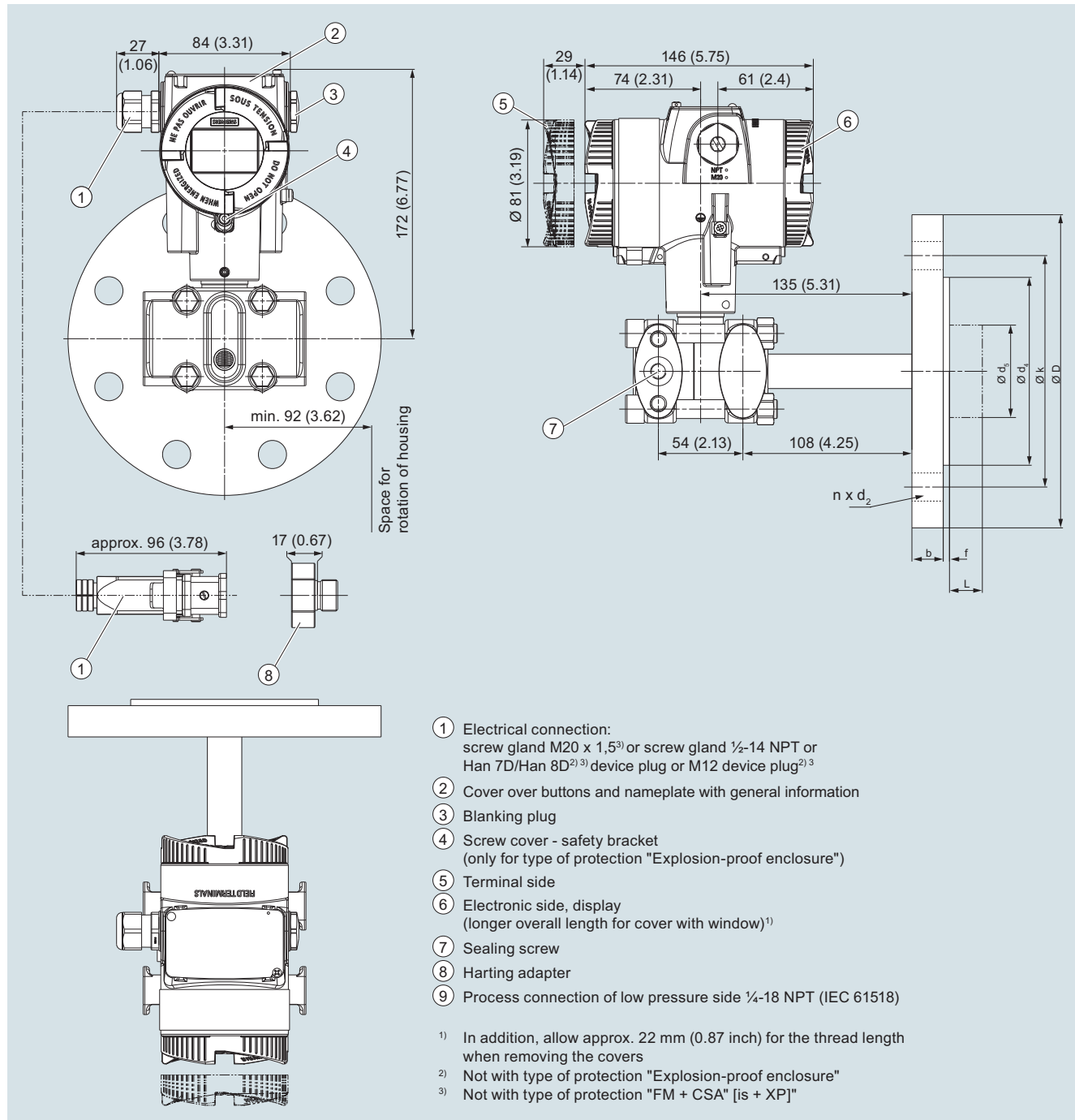
## Pressure Measurement

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

for level

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### Dimensional drawings



# Pressure Measurement

## Transmitters for applications with advanced requirements (Advanced)

### SITRANS P320/P420

for level

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## Connection to EN 1092-1

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> 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 <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> 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	



## Pressure Measurement

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

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for level

Process connection according to J.I.S

Nominal diameter	Nominal pressure	b	D	d <sub>2</sub>	d <sub>4</sub>	d <sub>5</sub>	d <sub>M</sub> with tube	d <sub>M</sub> 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)	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<sub>M</sub>: Effective diaphragm diameter