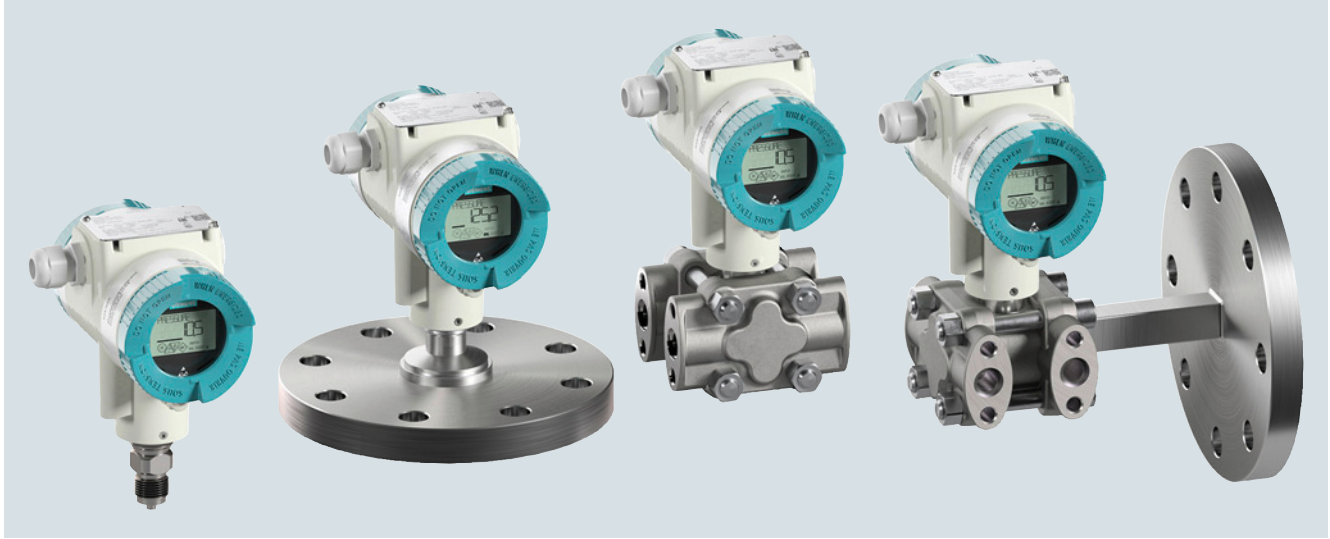


Pressure Measurement

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

Technical description

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 pressure 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 transmitters for gauge pressure

Measured variable:

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

Measuring span (infinitely adjustable)

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

There are two series:

- Gauge pressure series
- Differential pressure series

Pressure transmitters for absolute pressure

Measured variable:

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

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 8.3 mbar a to 160 bar a (0.12 to 2 321 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 "Flowmeters"))

Measuring span (infinitely adjustable)

- For SITRANS P320/P420 with HART: 1 mbar to 160 bar (0.0145 to 2 321 psi)

Pressure transmitters for level

Measured variable:

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

Measuring span (infinitely adjustable)

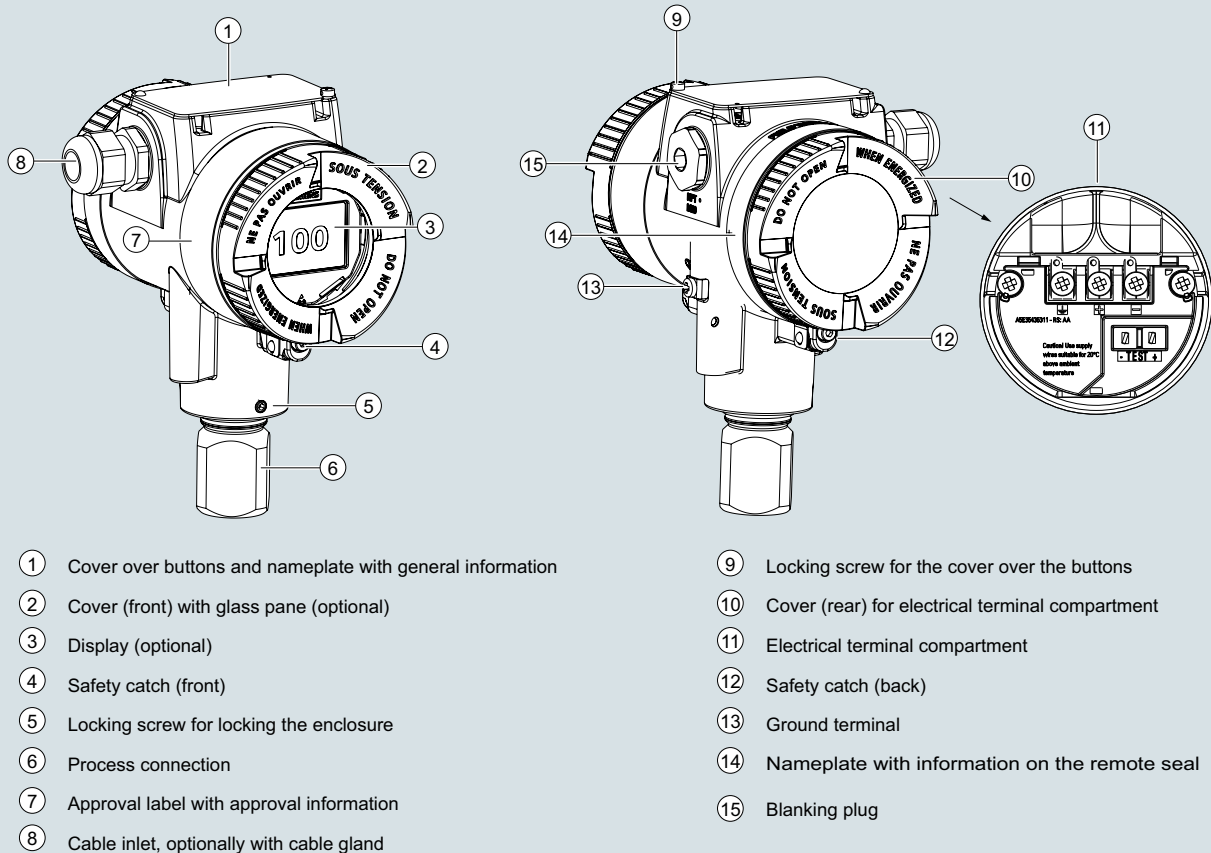
- For SITRANS P320/P420 with HART: 25 mbar to 5 bar (0.363 to 72.5 psi)

Type of the mounting flange:

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

Design

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



Device front view

- The electronics enclosure is made of die cast aluminum or precision cast stainless steel.
- The enclosure has a removable cover at the front and the back.
- Depending on the device version, the front cover (2) may be designed with a glass pane.
- 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 button cover (1), is located on the upper face of the enclosure. The nameplate with general information is located on the cover over the buttons.

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

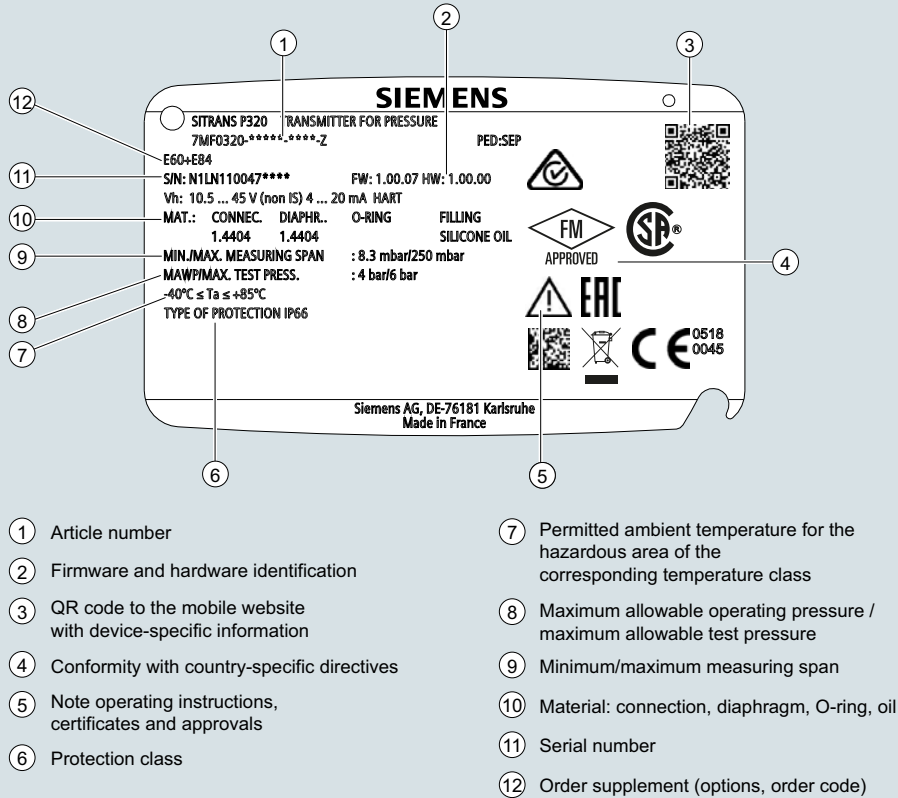
Technical description

1

Nameplates

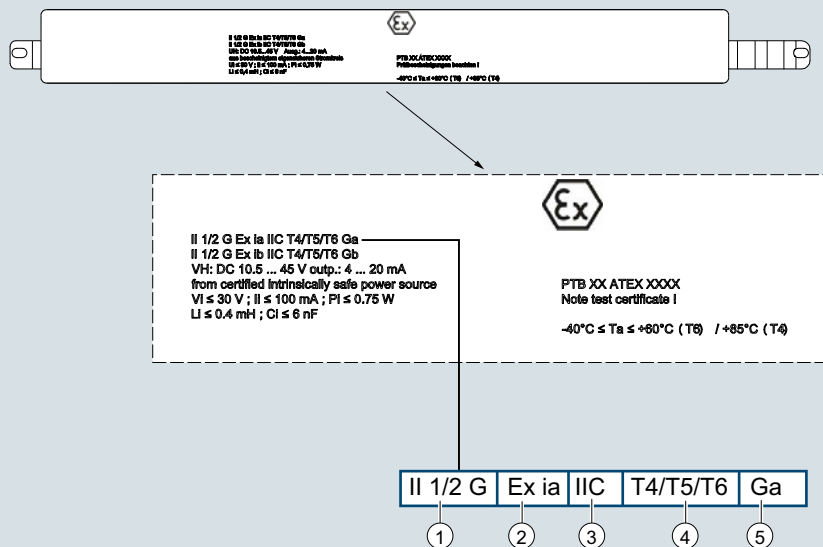
Nameplate

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.



Certification label with approval information

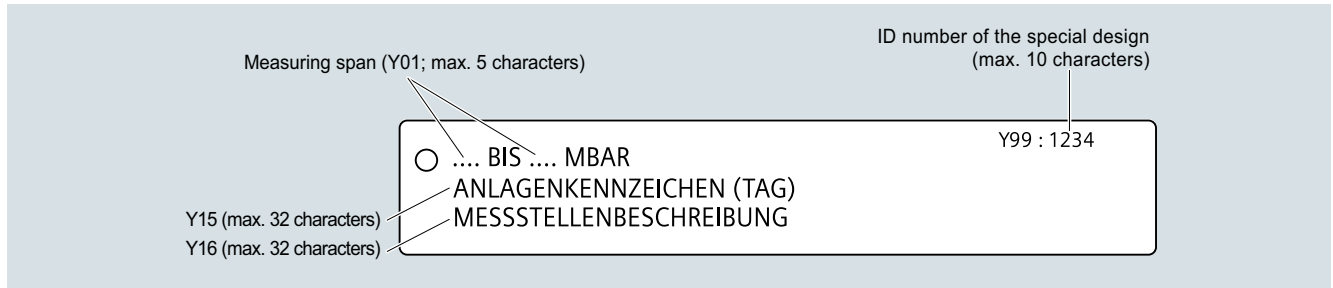
The certification label with approval information is located on the front of the enclosure.



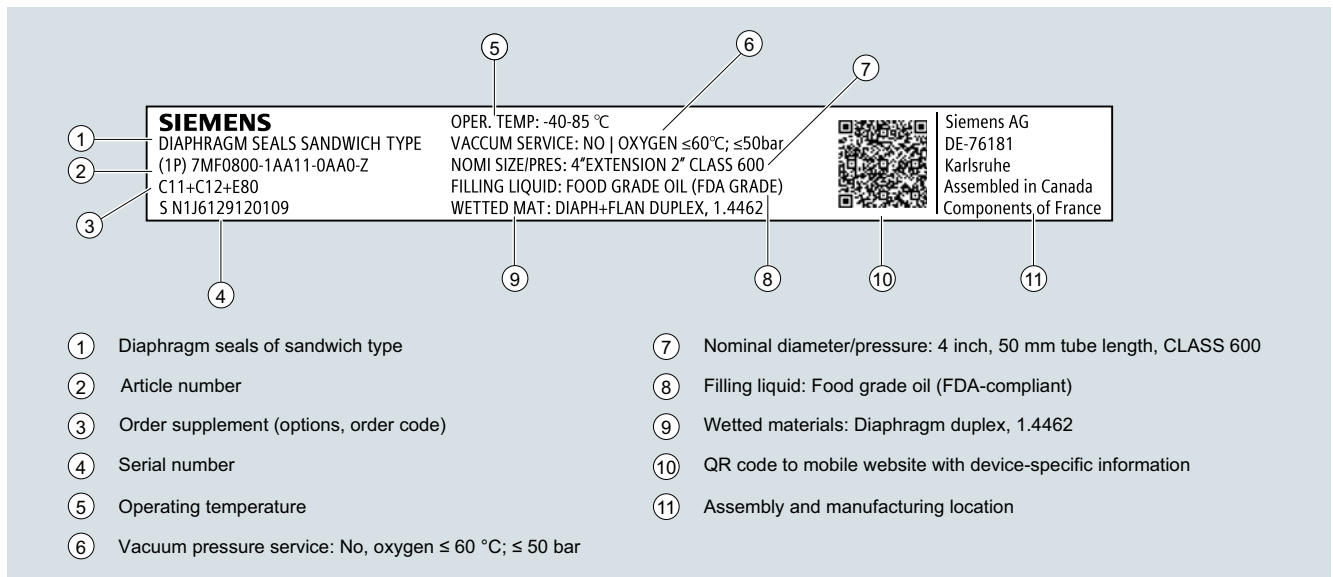
- ① Characteristics of the hazardous area
- ② Type of protection
- ③ Group (gas, dust)
- ④ Maximum surface temperature (temperature class)
- ⑤ Device protection level

Tag plate

The tag plate is fastened with a wire under the front cover.

Nameplate with information on the remote seals

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



Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

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 lower range value/upper range value	x	x	x
Setting lower range value/upper range value	x	x	x
Electrical damping	x	x	x
Zero adjustment	x	x	x
Fault current	x	x	x
Saturation limits	x	x	x
Scaling of the display	x	x	x
Characteristic curve selection	x	x	x
Temperature unit	x	x	x
Button lock	x	x	x
Change user PIN	x	x	x
Functional safety	x	x	x
Loop test	x	x	x
Start view	x	x	x
Pressure reference	x	x	x
Reset	x	x	x
Diagnostics and trend log			
Min/max pointer	—	x	x
Limit monitoring	—	2	2
Event counter (over-run/undershoot)	—	2	2
Maintenance and service timer	—	—	x
Trend log	—	—	2, max. 1 500 values
Diagnostic log	—	—	x
Parameters change log	—	—	x

Available physical units of display for SITRANS P320/P420

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

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

Technical specifications

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

Input

Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. permissible test pressure (pursuant to DIN 16086) (for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar	4 bar	6 bar
	0.83 ... 25 kPa	0.4 MPa	0.6 MPa
	0.12 ... 3.6 psi	58 psi	87 psi
	0.01 ... 1 bar	6 bar	9 bar
	1 ... 100 kPa	0.6 MPa	0.9 MPa
	0.15 ... 14.5 psi	87 psi	130 psi
	0.04 ... 4 bar	20 bar	30 bar
	4 ... 400 kPa	2 MPa	3 MPa
	0.58 ... 58 psi	290 psi	435 psi
	0.16 ... 16 bar	45 bar	70 bar
	0.016 ... 1.6 MPa	4.5 MPa	7 MPa
	2.3 ... 232 psi	652 psi	1015 psi
	0.63 ... 63 bar	80 bar	120 bar
	0.063 ... 6.3 MPa	8 MPa	12 MPa
	9.1 ... 914 psi	1160 psi	1740 psi
	1.6 ... 160 bar	240 bar	360 bar
	0.16 ... 16 MPa	24 MPa	36 MPa
	23 ... 2321 psi	3481 psi	5221 psi
	4 ... 400 bar	400 bar	600 bar
	0.4 ... 40 MPa	40 MPa	60 MPa
	58 ... 5802 psi	5802 psi	8702 psi
	7 ... 700 bar	800 bar	800 bar
	0.7 ... 70 MPa	80 MPa	80 MPa
	102 ... 10153 psi	11603 psi	11603 psi
Measuring limits	For 250 mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.		
• Lower measuring limit	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert oil	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with FDA-compliant oil	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Upper measuring limit	Between the measuring limits (infinitely adjustable)		
• Lower range value			

Output

Output signal	4 ... 20 mA
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA
• Upper saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA
• Ripple (without HART communication)	$I_{pp} \leq 0.5\%$ of max. output current
Adjustable damping	0 ... 100 s, continuously adjustable over remote operation
	0 ... 100 s, in increments of 0.1 s, adjustable over display
• Current transmitter	3.55 ... 22.8 mA
• Failure signal	3.55 ... 22.8 mA (factory preset to 3.55 mA)
Load	Resistance R [Ω]
• Without HART communication	$R = (U_H - 10.5 \text{ V}) / 22.8 \text{ mA}$, U_H : Power supply in V
• With HART communication	$R = 230 \dots 1100 \Omega$ (HART communicator (handheld)) $R = 230 \dots 500 \Omega$ (SIMATIC PDM)
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)
Physical bus	-
Polarity-independent	-

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge pressure (pressure series)

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

Measuring accuracy

Reference conditions

- According to IEC 62828-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, Turn-Down)

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

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

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

$\leq 0.065\%$ (SITRANS P420)

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

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

$\leq 0.04\%$ (SITRANS P420)

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

$r \leq 5$: $\leq 0.075\%$ (SITRANS P320)

$5 < r \leq 100$: $\leq (0.005 \cdot r + 0.05)\%$ (SITRANS P320)

$r \leq 5$: $\leq 0.075\%$ (SITRANS P420)

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

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

- 250 mbar/25 kPa/3.6 psi
- 1 bar/100 kPa/14.5 psi
- 4 bar/400 kPa/58 psi
- 16 bar/1.6 MPa/232 psi
- 63 bar/6.3 MPa/914 psi
- 160 bar/16 MPa/2321 psi
- 400 bar/40 MPa/5802 psi
- 700 bar/70 MPa/10152 psi

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

≤ 0.105 s

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

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

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

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

Medium temperature

- Measuring cell with silicone oil filling -40 ... +100 °C (-40 ... +212 °F)
- Measuring cell with inert oil
 - 1 bar/100 kPa/14.5 psi -40 ... +100 °C (-40 ... +212 °F)
 - 4 bar/400 kPa/58 psi
 - 16 bar/1.6 MPa/232 psi
 - 63 bar/6.3 MPa/914 psi
 - 160 bar/16 MPa/2321 psi -20 ... +100 °C (-4 ... +212 °F)
 - 400 bar/40 MPa/5802 psi
 - 700 bar/70 MPa/10152 psi
- Measuring cell with FDA-compliant oil -10 ... +100 °C (14 ... +212 °F)

Ambient conditions

- Ambient temperature/enclosure
 - Observe the temperature class in hazardous areas.
 - Measuring cell with silicone oil filling -40 ... +85 °C (-40 ... +185 °F)
 - Measuring cell with inert oil for gauge pressure measuring cells: -40 ... +85 °C (-40 ... +185 °F)
 - 1 bar/100 kPa/14.5 psi
 - 4 bar/400 kPa/58 psi
 - 16 bar/1.6 MPa/232 psi
 - 63 bar/6.3 MPa/914 psi
 - Measuring cell with inert oil -40 ... +85 °C (-40 ... +185 °F)
 - Measuring cell with FDA-compliant oil -10 ... +85 °C (14 ... +185 °F)
 - Display -20 ... +80 °C (-4 ... +176 °F)
- Storage temperature -50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F))
- Climatic class in accordance with IEC 60721-3-4 4K4H
- Degree of protection
 - According to IEC 60529 IP66, IP68
 - According to NEMA 250 Type 4X
- Electromagnetic compatibility
 - Emitted interference and interference immunity According to IEC 61326 and NAMUR NE 21

Structural design

Weight

Approx. 1.8 kg (3.9 lb) with aluminum enclosure
 Approx. 3.8 kg (8.3 lb) with stainless steel enclosure

Material

- Wetted parts materials
 - Process connection Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602
 - Oval flange Stainless steel, mat. no. 1.4404/316L
 - Seal diaphragm Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
- Non-wetted parts materials
 - Electronics enclosure
 - Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M
 - Standard: Powder coating with polyurethane
 - Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane
 - Stainless steel nameplate (1.4404/316L)
 - Mounting bracket Zinc-plated steel or stainless steel

Process connection

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

Electrical connection

Cable entry via the following screwed glands:

- M20 x 1.5
- ½-14 NPT
- Device plug Han 7D/Han 8D¹⁾
- Device plug M12

Displays and controls

Buttons

4 buttons for operation directly on the device

Display

- With or without integrated display (optional)
- Lid with inspection window (optional)

Pressure Measurement

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SITRANS P320/420

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 mod
Ripple	$U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)
Noise	$U_{eff} \leq 1.2 \text{ mV}$ (0.5 ... 10 kHz)
Auxiliary power	–
Separate supply voltage	–

Certificates and approvals

Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 18 ACC LY 277 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ19.1058X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA-18-GE-0035X (option E25)
Explosion protection	
• Intrinsic safety "i"	
- Marking	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6
- Permissible medium temperature	-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: $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$ $L_i = 0.24 \mu\text{H}/C_i = 3.29 \text{ nF}$
- 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 medium temperature	-40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Connection	To circuit with the operating values $U_n = 10.5 \dots 45 \text{ V}$, $4 \dots 20 \text{ mA}$
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Max. surface temperature	120 °C (248 °F)
- Connection	To circuit with the operating values $U_n = 10.5 \dots 45 \text{ V}$, $4 \dots 20 \text{ mA}$
• Dust explosion protection for Zones 20, 21, 22	
- Marking	Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible medium temperature	-40 ... +100 °C (-40 ... +212 °F)
- Connection	To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$ $L_i = 0.24 \mu\text{H}/C_i = 3.29 \text{ nF}$
- Effective internal inductance/capacitance	
• Type of protection for Zone 2	
- Marking	Ex II 3G Ex ec IIC T4/T6 Gc
- Permissible ambient temperature "ec"	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
- Permissible medium temperature	-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: $U_n = 10.5 \text{ to } 30 \text{ V}$, $4 \dots 20 \text{ mA}$
• Explosion protection acc. to FM	Available soon
- Marking (XP/DIP) or IS; NI; S	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
• Explosion protection according to CSA	Available soon
- Marking (XP/DIP) or (IS)	CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

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

NAMUR recommendations

- NE 06
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

Standardized Electrical Signals and Questions Relating to Engineering Technology
 Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
 Extra Low Voltage Circuits with Safe Separation
 Standardization of the Signal Level for the Failure Information of Digital Transmitters
 Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
 The Application of the Pressure Equipment Directive to Process Control Devices
 Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
 Self-Monitoring and Diagnosis of Field Devices
 NAMUR Standard Device - Field Devices for Standard Applications

¹⁾ Han 8D is identical to Han 8U.

Communication**HART**

HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

PROFIBUS PA

Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

FOUNDATION Fieldbus

Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge pressure (pressure series)

1

Selection and ordering data

Article No.

Pressure transmitters for gauge pressure (pressure series)

SITRANS P320

7MF030 - - - - -

SITRANS P420

7MF040 - - - - -

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

Communication

HART, 4 ... 20 mA

PROFIBUS PA

FOUNDATION Fieldbus (FF)

Measuring cell filling

Silicone oil

Inert liquid

Neobee oil

Maximum measuring span

250 mbar (3.6 psi)

1 000 mbar (14.5 psi)

4 000 mbar (58 psi)

16 bar (232 psi)

63 bar (914 psi)

160 bar (2 321 psi)

400 bar (5 802 psi)

700 bar (10 153 psi)

Process connection

Male thread M20 x 1.5

Male thread G½ (DIN EN 837-1)

Female thread ½-14 NPT

Male thread ½-14 NPT

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

Oval flange, mounting thread: M10 (DIN 19213)

Oval flange, mounting thread: M12 (DIN 19213)

Version for diaphragm seal pressure

Wetted parts materials: Process connection, seal diaphragm

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

Stainless steel 316L/1.4404, alloy C276/2.4819

Alloy C22/2.4602, alloy C276/2.4819

Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

Enclosure

Dual chamber device

Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

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

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

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

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

Electrical connections/cable entries

Thread for cable gland: Cable gland must be ordered separately as option (Axx)

• 2 x M20 x 1.5

• 2 x ½-14 NPT

Local operation/display

Without display (lid closed)

With display (lid closed)

With display (lid with glass pane)

0

1

2

1

3

4

F

J

N

Q

T

V

W

X

B

D

E

F

G

H

J

U

0

1

2

1

2

5

A

B

C

D

L

M

S

T

F

M

0

1

2

Pressure Measurement

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Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	A00
Metal	A01
Stainless steel	A02
Stainless steel 316L/1.4404	A03
CMP, for XP devices	A10
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	A30
Device plug Han 7D (plastic, angled)	A31
Device plug Han 7D (metal, straight)	A32
Device plug Han 7D (metal, angled)	A33
Device plug Han 8D (plastic, straight)	A34
Device plug Han 8D (plastic, angled)	A35
Device plug Han 8D (metal, straight)	A36
Device plug Han 8D (metal, angled)	A37
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	A40
Metal, for device plug Han 7D and Han 8D	A41
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91
Cable gland/device plug mounted left	A97
Cable gland/device plug mounted right	A99
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13
Italian (bar)	B14
Chinese (bar)	B15
Russian (bar)	B16
English (psi)	B20
English (Pa)	B30
Chinese (Pa)	B35
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	C11
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	C13
Factory certificate (EN 10204-2.2) - Wetted parts	C14
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	D10
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	D30
Unlabeled TAG plate	D40
Without labeling of the measuring range on the TAG plate	D41
Stainless steel Ex plate 1.4404/316L	D42
Overvoltage protection up to 6 kV (internal)	D70
Overvoltage protection up to 6 kV (external)	D71
Labels on transport packaging (provided by customer)	D90
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KCC	E09
Explosion protection approvals	
ATEX (Europe)	E20
CSA (USA and Canada) ¹⁾	E21
FM (USA and Canada) ¹⁾	E22
IECEX (Worldwide)	E23
EACEx (GOST-R, -K, -B)	E24
INMETRO (Brazil)	E25
KCs (Korea)	E26
NEPSI (China)	E27
PESO (India)	E28
UKR Sepro (Ukraine)	E30
ATEX (Europe) and IECEx (Worldwide)	E47
CSA (Canada) and FM (USA) ¹⁾	E48
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) ¹⁾	E49
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
LR (Lloyds Register)	E51
BV (Bureau Veritas)	E52
ABS (American Bureau of Shipping)	E53
RMR (Russian Maritime Register)	E55
KR (Korean Register of Shipping)	E56
RINA (Registro Italiano Navale)	E57
CCS (China Classification Society)	E58
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	E60
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	E80
Dual Seal	E81
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	E83
NSF61 (drinking water)	E84
ACS (drinking water)	E85

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge pressure (pressure series)

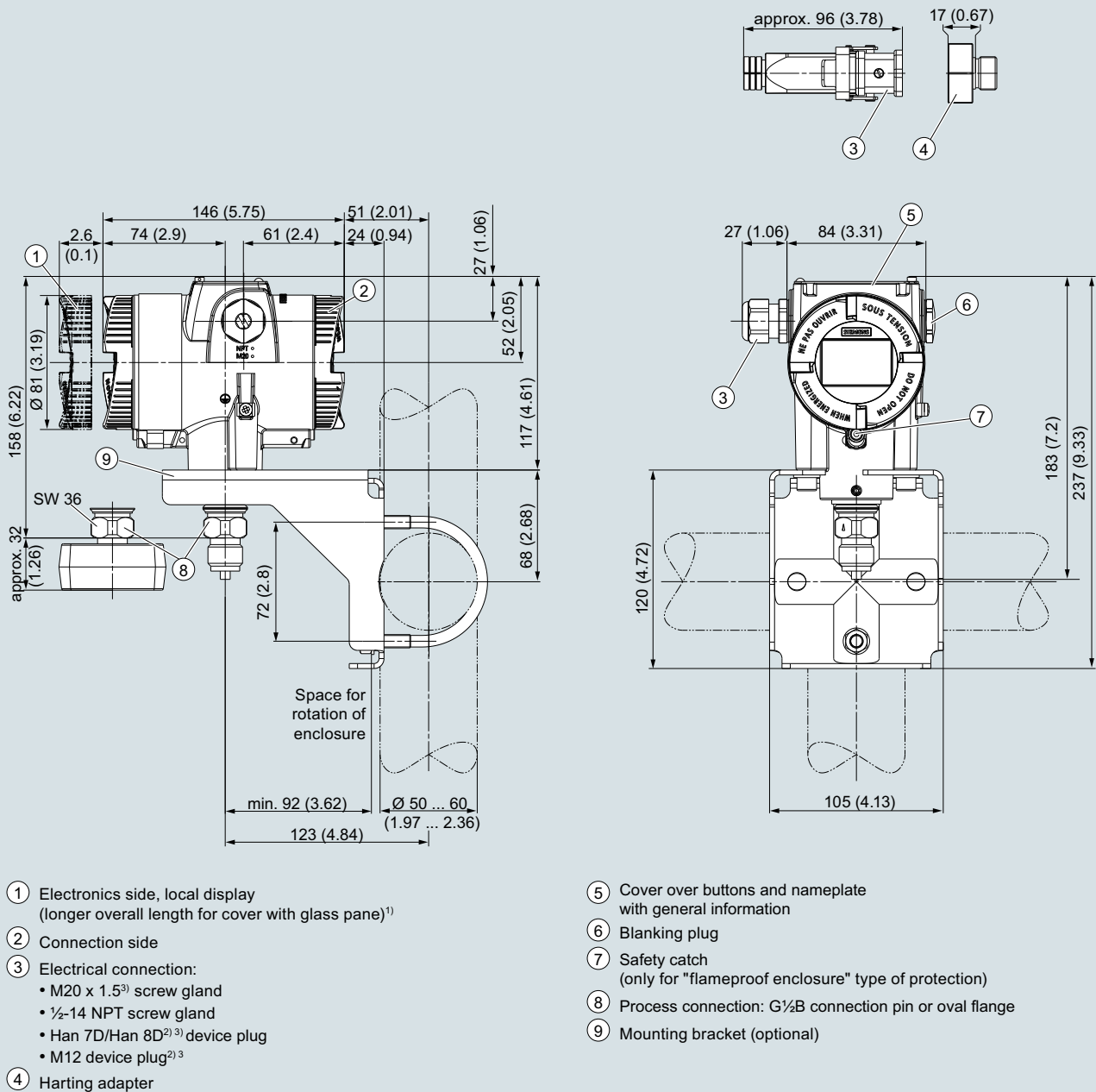
1

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Mounting bracket	
Steel, zinc-plated	H01
Stainless steel 1.4301/304	H02
Stainless steel 1.4404/316L	H03
Flange connections with flange EN 1092-1	
With flange adapter G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J80
• DN 50 PN 40, stainless steel 1.4571/316Ti	J81
• DN 80 PN 40, stainless steel 1.4571/316Ti	J82
With siphon G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J83
• DN 50 PN 40, stainless steel 1.4571/316Ti	J84
• DN 80 PN 40, stainless steel 1.4571/316Ti	J85
• DN 25 PN 100, stainless steel 1.4571/316Ti	J86
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
Seal (EN 837-1) material Fe (soft iron)	K60
Seal (EN 837-1) material 1.4571	K61
Seal (EN 837-1) material Cu	K62
Process connection	
Process connection male thread G½, bore hole 11 mm	K80
Shut-off valves, valve manifolds	
With mounted valve manifold 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	T02
With mounted valve manifold 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	T03
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	T05
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	T06

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Device settings	
Measuring span	Y01
Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm², kg/cm², kgf/cm², inH₂O, inH₂O (4°C), ftH₂O, mmH₂O, mmH₂O (4°C), mH₂O (4°C), mmHg, inHg, atm, torr	
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Input field: Free text, max. 32 characters	
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
Input field: Free text, max. 32 characters	
TAG short (device parameters, max. 8 characters)	Y17
Input field: Free text, max. 8 characters	
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	Y21
Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	
Local display Scaling with standard units [m³/s, l/s, m, inch, ...], example 1 ... 5 m	Y22
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Drop-down list: m, cm, mm, in, ft, m³, l, hl, in³, ft³, yd³, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm³, NI.	
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Input field 3: Free text, max. 8 characters	
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	Y30
Drop-down list 1: 3.9, 4	
Drop-down list 2: 20.8, 22	
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	Y31
Drop-down list: 3.75; 21.75; 22.5; 22.6	
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	Y32
Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	
ID number of special design	Y99
Input field: max. 4 characters and only natural numbers from 0 ... 9999	

¹⁾ Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Dimensional drawings



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

²⁾ Not with "flameproof enclosure" type of protection

³⁾ Not with type of protection "FM + CSA" [is + XP]

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge pressure (differential pressure series)

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Technical specifications

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

Input

Measured variable

Gauge pressure

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

Measuring span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

1 ... 20 mbar
0.1 ... 2 kPa
0.4019 ... 8.037 inH₂O

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

1 ... 60 mbar
0.1 ... 6 kPa
0.4019 ... 24.11 inH₂O

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

2.5 ... 250 mbar
0.2 ... 25 kPa
1.005 ... 100.5 inH₂O

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

6 ... 600 mbar
0.6 ... 60 kPa
2.41 ... 241.1 inH₂O

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

16 ... 1 600 mbar
1.6 ... 160 kPa
6.43 ... 643 inH₂O

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

50 ... 5 000 mbar
5 ... 500 kPa
20.09 ... 2 009 inH₂O

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

0.3 ... 30 bar
0.03 ... 3 MPa
4.35 ... 435 psi

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

8 ... 160 bar
0.8 ... 16 MPa
116 ... 2 320 psi

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

Measuring limits

- Lower measuring limit
 - Measuring cell with silicone oil filling
 - Measuring cell with inert oil
 - Measuring cell with FDA-compliant oil
- Upper measuring limit

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

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

- Lower range value

Between the measuring limits (infinitely adjustable)

Output

HART

Output signal

- Lower saturation limit (infinitely adjustable)
- Upper saturation limit (infinitely adjustable)
- Ripple (without HART communication)

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

Adjustable damping

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

- Current transmitter
- Failure signal

3.55 ... 22.8 mA
3.55 ... 22.8 mA

Load

- Without HART communication

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

Characteristic curve

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

Physical bus

-

Polarity-independent

-

Measuring accuracy

Reference conditions

- According to IEC 62828-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, Turn-Down)

- Linear characteristic curve
 - 20 mbar/2 kPa/8.031 inH₂O

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

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

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

- 60 mbar/6 kPa/24.09 inH₂O - 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH₂O 1 600 mbar/160 kPa/642.4 inH₂O 5 000 mbar/500 kPa/2008 inH₂O 30 bar/3 MPa/435 psi - 160 bar/16 MPa/2 320 psi	$r \leq 5:$ $5 < r \leq 60:$ $r \leq 5:$ $5 < r \leq 100:$ $r \leq 5:$ $5 < r \leq 20:$	$\leq 0.075\%$ $\leq (0.005 \cdot r + 0.05)\%$ $\leq 0.065\%$ (SITRANS P320) $\leq 0.04\%$ (SITRANS P420) $\leq (0.004 \cdot r + 0.045)\%$ $\leq 0.065\%$ (SITRANS P320) $\leq 0.04\%$ (SITRANS P420) $\leq (0.004 \cdot r + 0.045)\%$
Influence of ambient temperature in % per 28 °C (50 °F) • 20 mbar/2 kPa/8.031 inH₂O • 60 mbar/6 kPa/24.09 inH₂O • 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH₂O 1 600 mbar/160 kPa/642.4 inH₂O 5 000 mbar/500 kPa/2008 inH₂O 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi • 250 mbar/25 kPa/3.6 psi 5 000 mbar/500 kPa/2008 inH₂O • 600 mbar/60 kPa/240.9 inH₂O 1 600 mbar/160 kPa/642.4 inH₂O 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	$\leq (0.15 \cdot r + 0.1)\%$ $\leq (0.075 \cdot r + 0.1)\%$ $\leq (0.025 \cdot r + 0.125)\%$ (SITRANS P320) $\leq (0.025 \cdot r + 0.0625)\%$ (SITRANS P420) $\leq (0.0125 \cdot r + 0.0625)\%$ (SITRANS P420)	
Long-term stability at ± 30 °C (± 54 °F) • 20 mbar/2 kPa/8.031 inH₂O • 60 mbar/6 kPa/24.09 inH₂O • 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH₂O 1 600 mbar/160 kPa/642.4 inH₂O 5 000 mbar/500 kPa/2008 inH₂O 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	$\leq (0.2 \cdot r)\%$ per year In 5 years $\leq (0.25 \cdot r)\%$ In 5 years $\leq (0.125 \cdot r)\%$ In 10 years $\leq (0.15 \cdot r)\%$	
Step response time T_{E3} (without electrical damping) • 20 mbar/2 kPa/8.031 inH₂O • 60 mbar/6 kPa/24.09 inH₂O • 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH₂O 1 600 mbar/160 kPa/642.4 inH₂O 5 000 mbar/500 kPa/2008 inH₂O 30 bar/3 MPa/435 psi 160 bar/16 MPa/2 320 psi	Approx. 0.160 s Approx. 0.150 s Approx. 0.135 s	
Effect of mounting position (in pressure per change of angle) Effect of auxiliary power (in % per voltage change)	≤ 0.7 mbar/0.07 kPa/0.010 psi per 10° incline (zero offset is possible with position error compensation) 0.005% per 1 V	
Operating conditions		
Medium temperature • Measuring cell with silicone oil filling - Measuring cell 30 bar (435 psi) - Measuring cell 160 bar (2 320 psi) • Measuring cell with inert oil • In conjunction with dust explosion protection	-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -40 ... +85 °C (-4 ... +185 °F)	
Ambient conditions • Ambient temperature/enclosure - Measuring cell with silicone oil filling - Measuring cell with inert oil - Display • Storage temperature • Climatic class in accordance with IEC 60721-3-4 • Degree of protection - According to IEC 60529 - According to NEMA 250 • Electromagnetic compatibility - Emitted interference and interference immunity	Observe the temperature class in hazardous areas. -40 ... +85 °C (-40 ... +185 °F) -40 ... +85 °C (-40 ... +185 °F) -20 ... +80 °C (-4 ... +176 °F) -50 ... +85 °C (-58 ... +185 °F) 4K4H IP66, IP68 Type 4X According to IEC 61326 and NAMUR NE 21	
Structural design		
Weight	Approx. 3.9 kg (8.5 lb) with aluminum enclosure Approx. 5.9 kg (13 lb) with stainless steel enclosure	
Material		
• Wetted parts materials - Seal diaphragm - Process flanges and sealing plugs	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	

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge pressure (differential pressure series)

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

- O-ring • Non-wetted parts materials - Electronics enclosure - Process flange screws - Mounting bracket Process connection Electrical connection	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR • Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane - Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel nameplate (1.4404/316L) Stainless steel ISO 3506-1 A4-70 Steel, zinc-plated steel, or stainless steel 1/4-18 NPT female thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6092 psi)) Screw terminals Cable entry via the following screwed glands: • M20 x 1.5 • 1/2-14 NPT • Device plug Han 7D/Han 8D¹⁾ • Device plug M12
Displays and controls Buttons Display	4 buttons for operation directly on the device • With or without integrated display (optional) • Lid with inspection window (optional)
Auxiliary power U_H Terminal voltage on pressure transmitter Ripple Noise Auxiliary power Separate supply voltage	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod $U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz) $U_{eff} \leq 1.2 \text{ mV}$ (0.5 ... 10 kHz) – –
Certificates and approvals Classification according to pressure equipment directive (PED 2014/68/EU) Drinking water • WRAS (England) • ACS (France) • NSF (USA) CRN (Canada) Explosion protection acc. to NEPSI (China) Explosion protection acc. to INMETRO (Brazil) Explosion protection • Intrinsic safety "i" - Marking - Permissible ambient temperature - Permissible medium temperature - Connection - Effective internal inductance/capacitance • Flameproof enclosure "d" - Marking - Permissible ambient temperature - Permissible medium temperature - Connection • Dust explosion protection for Zones 21, 22 - Marking - Permissible ambient temperature - Permissible medium temperature - Max. surface temperature - Connection • Dust explosion protection for Zones 20, 21, 22 - Marking - Permissible ambient temperature - Permissible medium temperature - Connection - Effective internal inductance/capacitance	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice) No.: 1903094 (option E83) No.: 18 ACC LY 277 (option E85) No.: 20180920-MH61350 (option E84) No.: 0F9863.5C (option E60) No.: GYJ19.1058X (option E27) No.: BRA-18-GE-0035X (option E25) II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$ Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To circuit with the operating values: $U_n = 10.5 \text{ ... } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$ Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc -40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F) 120 °C (248 °F) To circuit with the operating values: $U_n = 10.5 \text{ ... } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$ Ex II 1D Ex ia IIIC T120 °C Da Ex II 2D Ex ib IIIC T120 °C Db -40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F) To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$

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

- Type of protection for Zone 2 - Marking - Permissible ambient temperature "ec" - Permissible medium temperature - "ec" connection - Explosion protection acc. to FM - Marking (XP/DIP) or IS; NI; S - Explosion protection according to CSA - Marking (XP/DIP) or (IS)	Ex II 3G Ex ec IIC T4/T6 Gc -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +40 °C (-40 ... +104 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To circuit with the operating values: $U_n = 10.5 \dots 30 \text{ V}$, $4 \dots 20 \text{ mA}$ Available soon CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III Available soon CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III
NAMUR recommendations	
- NE 06 - NE 21 - NE 23 - NE 43 - NE 53 - NE 80 - NE 105 - NE 107 - NE 131	Standardized Electrical Signals and Questions Relating to Engineering Technology Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment Extra Low Voltage Circuits with Safe Separation Standardization of the Signal Level for the Failure Information of Digital Transmitters Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics The Application of the Pressure Equipment Directive to Process Control Devices Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices Self-Monitoring and Diagnosis of Field Devices NAMUR Standard Device - Field Devices for Standard Applications

¹⁾ Han 8D is identical to Han 8U.

Communication

PROFIBUS PA		FOUNDATION Fieldbus	
Simultaneous communication with master class 2 (max.)	4	Device profile	FF ITK 6
The address can be set using	Configuration tool or local operation (standard setting address 126)	Function blocks	3 function blocks analog input, 1 function block PID
Cyclic data usage		- Analog input - Adaptation to user-specific process variable - Electrical damping adjustable - Simulation function - Response to failure - Limit monitoring - Square-rooted characteristic curve for flow measurement - PID - Physical block	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input (can be locked within the device with a bridge) Parameterizable (last good value, substitute value, incorrect value) Yes, one upper and lower warning limit and one alarm limit respectively Yes
Internal preprocessing		Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX	- Pressure transducer block - Can be calibrated by applying two pressures - Monitoring of sensor limits - Simulation function: pressure measurement, sensor temperature and electronics temperature	Standard FOUNDATION Fieldbus function block 1 resource block Yes Yes Constant value or by means of parameterizable ramp function
Number of function blocks	7	HART	
- Analog input - Adaptation to user-specific process variable - Electrical damping adjustable - Simulation function - Limit monitoring - Register (totalizer) - Limit monitoring - Physical block	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input Yes, one upper and lower warning limit and one alarm limit respectively Can be reset, preset, optional direction of counting, simulation function of register output One upper and lower warning limit and one alarm limit respectively 1	HART	230 ... 1 100 Ω
Transducer blocks	1	Protocol	HART 7
- Pressure transducer block - Can be calibrated by applying two pressures - Monitoring of sensor limits - Specification of a vessel characteristic with - Square-rooted characteristic curve for flow measurement - Tank characteristic curve for volume measurement - Low flow cut-off and implementation point of square-root extraction - Simulation function for measured pressure value and sensor temperature	Yes Yes Max. 30 nodes Yes Yes Parameterizable Constant value or by means of parameterizable ramp function	Software for computer	SIMATIC PDM

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge pressure (differential pressure series)

1

Selection and ordering data

Article No.

Pressure transmitters for gauge pressure (differential pressure series)

SITRANS P320

7MF031 - - - - -

SITRANS P420

7MF041 - - - - -

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

Communication

HART, 4 ... 20 mA

PROFIBUS PA

FOUNDATION Fieldbus (FF)

Measuring cell filling

Silicone oil

Inert filling liquid

Maximum measuring span

20 mbar (8.037 inH₂O)

60 mbar (24.11 inH₂O)

250 mbar (1005 inH₂O)

600 mbar (241.1 inH₂O)

1 600 mbar (643 inH₂O)

5 000 mbar (2009 inH₂O)

30 bar (435 psi)

160 bar (2 320 psi)

Process connection

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

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

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

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

Wetted parts materials: Process connection, seal diaphragm

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

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

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

Tantalum/tantalum, process flange stainless steel 316/1.4408

(not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

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

(not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

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

(not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

Enclosure

Dual chamber device

Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

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

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

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

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

Electrical connections/cable entries

Thread for cable gland: Cable gland must be ordered separately as option (Axx)

• 2 x M20 x 1.5

• 2 x $\frac{1}{2}$ -14 NPT

Local operation/display

Without display (lid closed)

With display (lid closed)

With display (lid with glass pane)

0

1

2

1

3

B

D

G

H

M

P

R

Y

L

M

N

P

0

1

2

4

6

8

1

2

5

A

B

C

D

L

M

S

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F

M

0

1

2

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge pressure (differential pressure series)

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Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	A00
Metal	A01
Stainless steel	A02
Stainless steel 316L/1.4404	A03
CMP, for XP devices	A10
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	A30
Device plug Han 7D (plastic, angled)	A31
Device plug Han 7D (metal, straight)	A32
Device plug Han 7D (metal, angled)	A33
Device plug Han 8D (plastic, straight)	A34
Device plug Han 8D (plastic, angled)	A35
Device plug Han 8D (metal, straight)	A36
Device plug Han 8D (metal, angled)	A37
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	A40
Metal, for device plug Han 7D and Han 8D	A41
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91
Cable gland/device plug mounted left	A97
Cable gland/device plug mounted right	A99
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13
Italian (bar)	B14
Chinese (bar)	B15
Russian (bar)	B16
English (psi)	B20
English (Pa)	B30
Chinese (Pa)	B35
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	C11
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	C13
Factory certificate (EN 10204-2.2) - Wetted parts	C14
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	D10
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	D30
Unlabeled TAG plate	D40
Without labeling of the measuring range on the TAG plate	D41
Stainless steel Ex plate 1.4404/316L	D42
Overvoltage protection up to 6 kV (internal)	D70
Overvoltage protection up to 6 kV (external)	D71
Labels on transport packaging (provided by customer)	D90
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KCC	E09
Explosion protection approvals	
ATEX (Europe)	E20
CSA (USA and Canada) ¹⁾	E21
FM (USA and Canada) ¹⁾	E22
IECEX (Worldwide)	E23
EACEx (GOST-R, -K, -B)	E24
INMETRO (Brazil)	E25
KCs (Korea)	E26
NEPSI (China)	E27
PESO (India)	E28
UKR Sepro (Ukraine)	E30
ATEX (Europe) and IECEx (Worldwide)	E47
CSA (Canada) and FM (USA) ¹⁾	E48
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) ¹⁾	E49
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
LR (Lloyds Register)	E51
BV (Bureau Veritas)	E52
ABS (American Bureau of Shipping)	E53
RMR (Russian Maritime Register)	E55
KR (Korean Register of Shipping)	E56
RINA (Registro Italiano Navale)	E57
CCS (China Classification Society)	E58
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	E60

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge pressure (differential pressure series)

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Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	E80
Dual Seal	E81
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	E83
NSF61 (drinking water)	E84
ACS (drinking water)	E85
Mounting bracket	
Steel, zinc-plated	H01
Stainless steel 1.4301/304	H02
Stainless steel 1.4404/316L	H03
Process flanges; screw plug with vent valve	
Welded in on right	J08
Welded in on left	J09
Glued in on right	J10
Glued in on left	J11
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J70
• DN 50 PN 40, stainless steel 1.4571/316Ti	J71
• DN 80 PN 40, stainless steel 1.4571/316Ti	J72
• DN 15 PN 40, stainless steel 1.4571/316Ti	J78
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J73
• DN 50 PN 40, stainless steel 1.4571/316Ti	J74
• DN 80 PN 40, stainless steel 1.4571/316Ti	J75
Flange connection options	
Flange connection and temperature extension	J76
Flange connection with epoxy resin coating	J77
Process flanges; special materials	
Reserved for 7MF7: without process flanges, without screws, without gaskets	K00
Process flange material alloy C22/2.4602	K01
Process flange material Monel 400/2.4360	K02
Process connection material PVDF, on the side ½-14 NPT	K05
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	K06
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	K07
Process flanges; process connection option	
Process flange with process connection G½ welded on	K20
Process connection NAM (ASTAVA)	K21
Process flanges chambered with gaskets	
1x chambered, graphite	K40
1x chambered, PTFE	K41
2x chambered, PTFE	K42
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE	K50
O-ring, process flanges, FEP (with silicone core, approved for food)	K51
O-ring, process flanges, FFKM (FFPM)	K52
O-ring, process flanges, NBR	K53
O-ring, process flanges, EPDM	K54

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	K81
Process flanges (+) - side front	K82
Process flange screws, process flange nuts, material Monel 400/2.4360	K83
Valve ¼-18 NPT, material same as process flanges	K84
Valve mounted on the side, measured medium: Gas	K85
Oval flange attached, PTFE seal + fastening screws	K86
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U01
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U02
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U03
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U04

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm ² , kg/cm ² , kgf/cm ² , inH ₂ O, inH ₂ O (4°C), ftH ₂ O, mmH ₂ O, mmH ₂ O (4°C), mH ₂ O (4°C), mmHg, inHg, atm, torr	Y01
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	Y16
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	Y17
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	Y21
Local display Scaling with standard units [m ³ /s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m ³ , l, hl, in ³ , ft ³ , yd ³ , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm ³ , NI.	Y22
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	Y32
ID number of special design Input field: max. 4 characters and only natural numbers from 0 ... 9999	Y99

¹⁾ Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Pressure Measurement

Pressure transmitters

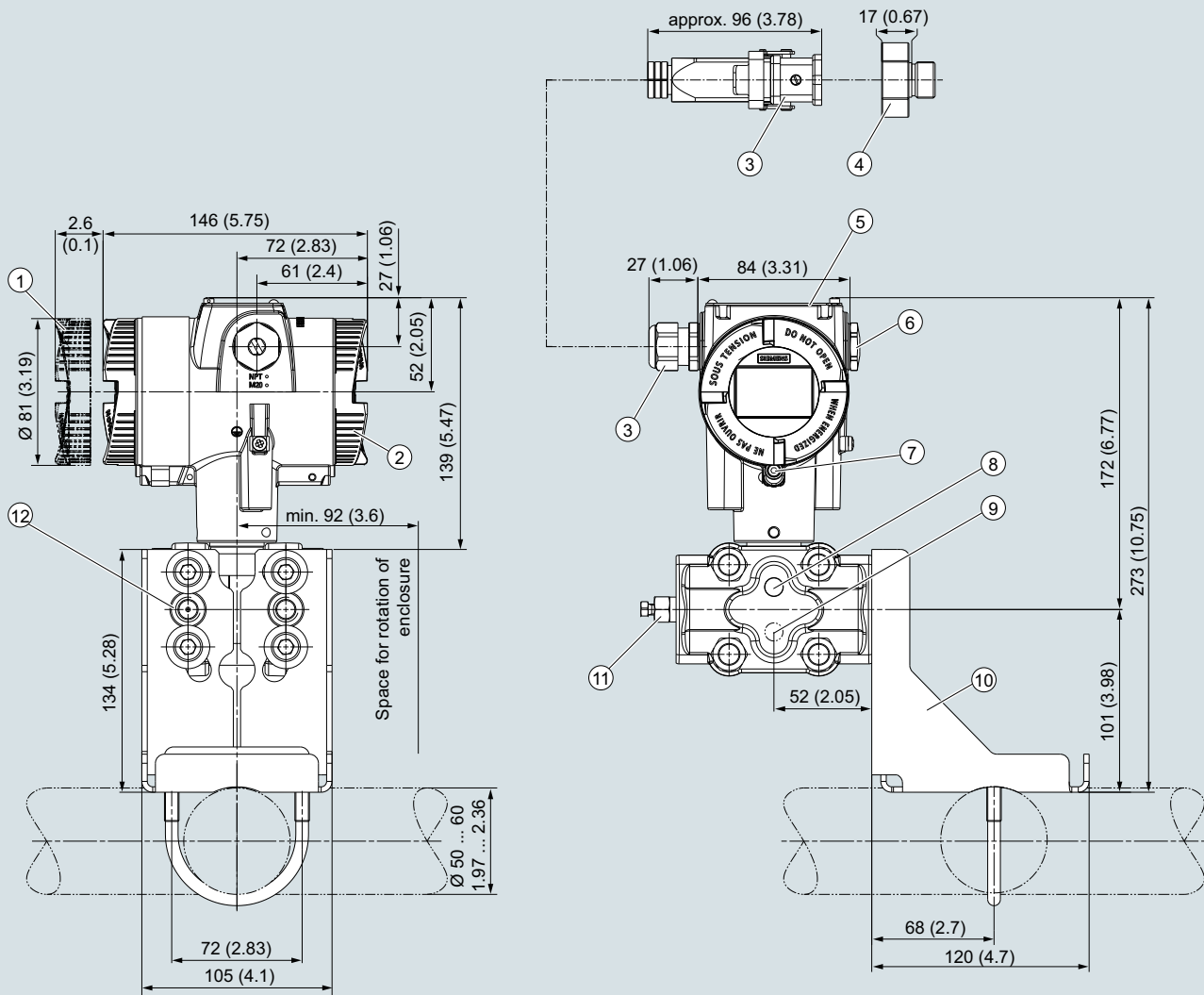
for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge pressure (differential pressure series)

1

Dimensional drawings



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

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

²⁾ Not with "flameproof enclosure" type of protection

³⁾ Not with type of protection "FM + CSA" [is + XP]"

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

Technical specifications

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

Input of gauge pressure with front-flush diaphragm

Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure and max. permissible test pressure	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi 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	Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange ¹⁾	
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with inert oil	100 mbar a/10 kPa a/1.45 psi a		
- Measuring cell with FDA-compliant oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of max. measuring span		

Input of absolute pressure, with flush-mounted diaphragm

Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure and max. permissible test pressure	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	43 ... 1300 mbar a 4.3 ... 130 kPa a 17 ... 525 inH ₂ 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	Refer to the information on the nameplate of the pressure transmitter and the data on the mounting flange ¹⁾	
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	0 bar a/0 kPa a/0 psi a		
• Upper measuring limit	100% of max. measuring span		
Lower range value	Between the measuring limits (infinitely adjustable)		

Output

Output signal	HART
• Lower saturation limit (infinitely adjustable)	4 ... 20 mA
• Upper 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	Resistance R [Ω]
• Without HART communication	$R = (U_H - 10.5 \text{ V}) / 22.8 \text{ mA}$, U_H : Power supply in V
• With HART communication	$R = 230 \dots 1100 \Omega$ (HART communicator (handheld)) $R = 230 \dots 500 \Omega$ (SIMATIC PDM)
Characteristic curve	- Linearly increasing or linearly decreasing - Linear increase or decrease or according to the square root (only for differential pressure and flow)
Physical bus	-
Polarity-independent	-

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge and absolute pressure, flush-mounted diaphragm

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

Gauge pressure measuring accuracy, with front-flush diaphragm

Reference conditions

- According to IEC 62828-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, Turn-Down)

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

- Linear characteristic curve

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

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

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

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

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

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

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

- Temperature difference between medium temperature and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

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

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

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

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

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

≤ 0.105 s

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

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

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

Absolute pressure measuring accuracy with flush diaphragm

Reference conditions

- According to IEC 62828-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, Turn-Down)

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

- Linear characteristic curve

- All measuring cells

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

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

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

- All measuring cells

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

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

- Temperature difference between medium temperature and ambient temperature

3 mbar/0.3 kPa/0.04 psi per 10 K

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

- All measuring cells

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

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

≤ 0.105 s

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

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

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

SITRANS P320/SITRANS P420 for gauge and absolute pressure, with flush-mounted diaphragm**Operating conditions**Medium temperature²⁾

- Measuring cell with silicone oil filling

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

Ambient conditions

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

-40 ... +85 °C (-40 ... +185 °F)

1 bar/100 kPa/14.5 psi

4 bar/400 kPa/58 psi

16 bar/1.6 MPa/232 psi

63 bar/6.3 MPa/914 ps

-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

-40 ... +85 °C (-40 ... +185 °F)

Structural design

Weight (pressure transmitter without mounting flange)

Approx. 1.8 kg (3.5 lb) with aluminum enclosure
 Approx. 3.8 kg (8.3 lb) with stainless steel enclosure

Material

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

Stainless steel, mat. no. 1.4404/316L

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

- 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 nameplate (1.4404/316L)

Steel, zinc-plated steel, or stainless steel

- Mounting bracket

Process connection

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

Electrical connection

Cable entry via the following screwed glands:

- M20 x 1.5
- ½-14 NPT
- Device plug Han 7D/Han 8D³⁾
- Device plug M12

Displays and controls

Buttons

4 buttons for operation directly on the device

Display

- With or without integrated display (optional)
- Lid 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 mod

Ripple

U_{SS} ≤ 0.2 V (47 ... 125 Hz)

Noise

U_{eff} ≤ 1.2 mV (0.5 ... 10 kHz)

Auxiliary power

—

Separate supply voltage

—

Certificates and approvals

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

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

Drinking water

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

No.: 1903094 (option E83)

No.: 18 ACC LY 277 (option E85)

No.: 20180920-MH61350 (option E84)

CRN (Canada)

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

Explosion protection acc. to NEPSI (China)

No.: GYJ19.1058X (option E27)

Explosion protection acc. to INMETRO (Brazil)

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge and absolute pressure, flush-mounted diaphragm

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

Explosion protection

• Intrinsic safety "i"

- Marking
- Permissible ambient temperature
- Permissible medium temperature
- Connection

II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb
 -40 ... +80 °C (-40 ... +176 °F) temperature class T4
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
 -40 ... +100 °C (-40 ... +212 °F) temperature class T4
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
 To certified intrinsically safe circuits with 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
- Permissible ambient temperature
- Permissible medium temperature
- Connection

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

• Dust explosion protection for Zones 21, 22

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

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

• Dust explosion protection for Zones 20, 21, 22

- Marking
- Permissible ambient temperature
- Permissible medium temperature
- Connection

Ex II 1D Ex ia IIIC T120 °C Da
 Ex II 2D Ex ib IIIC T120 °C Db
 -40 ... +80 °C (-40 ... +176 °F)
 -40 ... +100 °C (-40 ... +212 °F)
 To certified intrinsically safe circuits with 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
- Permissible ambient temperature "ec"
- Permissible medium temperature
- "ec" connection

Ex II 3G Ex ec IIC T4/T6 Gc
 -40 ... +80 °C (-40 ... +176 °F) temperature class T4
 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
 -40 ... +100 °C (-40 ... +212 °F) temperature class T4
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
 To circuit with the operating values
 $U_n = 10.5 \text{ ... } 30 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

• Explosion protection acc. to FM

- Marking (XP/DIP) or IS; NI; S

Available soon

• Explosion protection according to CSA

- 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

Available soon

CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

NAMUR recommendations

- NE 06
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

Standardized Electrical Signals and Questions Relating to Engineering Technology
 Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
 Extra Low Voltage Circuits with Safe Separation
 Standardization of the Signal Level for the Failure Information of Digital Transmitters
 Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
 The Application of the Pressure Equipment Directive to Process Control Devices
 Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
 Self-Monitoring and Diagnosis of Field Devices
 NAMUR Standard Device - Field Devices for Standard Applications

- 1) The MAWP value of the pressure transmitter can be lower than the PN value of the mounting flange and vice versa.
To determine the maximum permissible operating pressure and the maximum permissible test pressure, use the lowest value as reference.
- 2) Observe the temperature limits in the process connection standards (e.g. DIN 32676 and DIN 11851) for the maximum medium temperature for flush-mounted process connections.
- 3) Han 8D is identical to Han 8U.

Communication

HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

FOUNDATION Fieldbus

Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge and absolute pressure, flush-mounted diaphragm

1

Selection and ordering data

Article No.

Pressure transmitter for gauge and absolute pressure, with flush-mounted diaphragm

SITRANS P320 for gauge pressure

7MF030 - - - - -

SITRANS P420 for gauge pressure

7MF040 - - - - -

SITRANS P320 for absolute pressure

7MF032 - - - - -

SITRANS P420 for absolute pressure

7MF042 - - - - -

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

Communication

HART, 4 ... 20 mA

0

PROFIBUS PA

1

FOUNDATION Fieldbus (FF)

2

Measuring cell filling

Silicone oil

1

Inert filling liquid

3

Neobee oil

4

Maximum measuring span

1 000 mbar (14.5 psi)

0

J

4 000 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

5 000 mbar a (72.5 psi a)

2

P

30 bar a (435 psi a)

2

R

Process connection

Flush-mounted diaphragm

K

Wetted parts materials: Process connection, seal diaphragm

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

0

Stainless steel 316L/1.4404, alloy C276/2.4819

1

Alloy C22/2.4602, alloy C276/2.4819

2

Non-wetted parts materials

Die-cast aluminum

1

Stainless steel precision casting CF3M/1.4409 similar to 316L

2

Enclosure

Dual chamber device

5

Type of protection

Without Ex

A

Intrinsic safety

B

Flameproof enclosure

C

Flameproof enclosure, intrinsic safety

D

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

L

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

M

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

S

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

T

Electrical connections/cable entries

Thread for cable gland: Cable gland must be ordered separately as option (Axx)

• 2 x M20 x 1.5

F

• 2 x 1/2-14 NPT

M

Local operation/display

Without display (lid closed)

0

With display (lid closed)

1

With display (lid with glass pane)

2

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge and absolute pressure, flush-mounted diaphragm

1

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	A00
Metal	A01
Stainless steel	A02
Stainless steel 316L/1.4404	A03
CMP, for XP devices	A10
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	A30
Device plug Han 7D (plastic, angled)	A31
Device plug Han 7D (metal, straight)	A32
Device plug Han 7D (metal, angled)	A33
Device plug Han 8D (plastic, straight)	A34
Device plug Han 8D (plastic, angled)	A35
Device plug Han 8D (metal, straight)	A36
Device plug Han 8D (metal, angled)	A37
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	A40
Metal, for device plug Han 7D and Han 8D	A41
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91
Cable gland/device plug mounted left	A97
Cable gland/device plug mounted right	A99
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13
Italian (bar)	B14
Chinese (bar)	B15
Russian (bar)	B16
English (psi)	B20
English (Pa)	B30
Chinese (Pa)	B35
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	C11
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	C13
Factory certificate (EN 10204-2.2) - Wetted parts	C14
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	D10
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	D30
Unlabeled TAG plate	D40
Without labeling of the measuring range on the TAG plate	D41
Stainless steel Ex plate 1.4404/316L	D42
Overvoltage protection up to 6 kV (internal)	D70
Overvoltage protection up to 6 kV (external)	D71
Labels on transport packaging (provided by customer)	D90
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KCC	E09
Explosion protection approvals	
ATEX (Europe)	E20
CSA (USA and Canada) ¹⁾	E21
FM (USA and Canada) ¹⁾	E22
IECEx (Worldwide)	E23
EACEx (GOST-R, -K, -B)	E24
INMETRO (Brazil)	E25
KCs (Korea)	E26
NEPSI (China)	E27
PESO (India)	E28
UKR Sepro (Ukraine)	E30
ATEX (Europe) and IECEx (Worldwide)	E47
CSA (Canada) and FM (USA) ¹⁾	E48
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) ¹⁾	E49
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
LR (Lloyds Register)	E51
BV (Bureau Veritas)	E52
ABS (American Bureau of Shipping)	E53
RMR (Russian Maritime Register)	E55
KR (Korean Register of Shipping)	E56
RINA (Registro Italiano Navale)	E57
CCS (China Classification Society)	E58
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	E60

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge and absolute pressure, flush-mounted diaphragm

1

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	E80
Dual Seal	E81
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	E83
NSF61 (drinking water)	E84
ACS (drinking water)	E85
3A (hygiene)	E86
EHEDG (hygiene)	E87
Process flanges, gaskets (instead of standard gas-kets FKM (FPM))	
Seal (EN 837-1) material Fe (soft iron)	K60
Seal (EN 837-1) material 1.4571	K61
Seal (EN 837-1) material Cu	K62
Process connection	
Process connection male thread G½, bore hole 11 mm	K80
Flanges according to EN 1092-1 Form B1 and ASME standard B16.5	
EN 1092-1 Form B1	
• DN 50 PN 16	M03
• DN 80 PN 16	M05
• DN 25 PN 40	M10
• DN 40 PN 40	M12
• DN 50 PN 40	M13
• DN 80 PN 40	M15
• DN 40 PN 100	M22
ASME B16.5	
• 1" Class 150 RF	M30
• 1 ½" Class 150 RF	M31
• 2" Class 150 RF	M32
• 3" Class 150 RF	M33
• 4" Class 150 RF	M34
• 1 ½" Class 300 RF	M36
• 2" Class 300 RF	M37
• 3" Class 300 RF	M38
• 4" Class 300 RF	M39
Sanitary connections in accordance with the standard	
Sanitary flange DIN 11851	
• with slotted union nut DN 50 PN 25	N03
• with slotted union nut DN 80 PN 25	N05
Tri-Clamp	
• DIN 32676 DN 50 PN 16	N14
• DIN 32676 DN 65 PN 10	N15
• ISO 2852 2" PN 40	N22
• ISO 2852 3" PN 40	N23
Aseptic threaded socket	
• DIN 11864-1 Form A DN 50 PN 25	N33
• DIN 11864-1 Form A DN 65 PN 25	N34
• DIN 11864-1 Form A DN 80 PN 25	N35
• DIN 11864-1 Form A DN100 PN 25	N36
Aseptic flange with notch	
• DIN 11864-2 Form A DN 50 PN 16	N43
• DIN 11864-2 Form A DN 65 PN 16	N44
• DIN 11864-2 Form A DN 80 PN 16	N45
• DIN 11864-2 Form A DN100 PN 16	N46
Aseptic clamp with groove	
• DIN 11864-3 Form A DN 50 PN 25	N53
• DIN 11864-3 Form A DN 65 PN 25	N54
• DIN 11864-3 Form A DN 80 PN 16	N55
• DIN 11864-3 Form A DN100 PN 16	N56

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Sanitary connections manufacturer-specific	
Varivent type N for pipes DN 40 ... DN 125 PN 40	P06
Sanitary connections special design	
Tank connection	
• TG 52/50 PN 40 with seal	Q00
• TG 52/150 PN 40 with seal	Q01
DRD flange D = 65 mm DN 50 PN 40	Q15
SMS socket	
• with thread 2" PN 25	Q28
• with thread 2 ½" PN 25	Q29
• with thread 3" PN 25	Q30
Weldable sockets for tank connection	
Weldable piece for TG52/50	Q90
Weldable piece for TG52/150	Q91
Connections for the paper industry	
Process connection PMC Style Standard	R00
Process connection PMC Style Minibolt	R01
Weldable sockets for PMC Style Standard	R02
Weldable sockets for PMC Style Minibolt	R03
Threaded connection	
Male thread G¾-A DIN 3852	R11
Male thread G1-A DIN 3852	R12
Male thread G2-A DIN 3852	R14
Special options front-flush	
Temperature decoupler (media temperature up to 200 °C)	R85
Mating connector including seal	R90

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm ² , kg/cm ² , kgf/cm ² , inH ₂ O, inH ₂ O (4°C), ftH ₂ O, mmH ₂ O, mmH ₂ O (4°C), mH ₂ O (4°C), mmHg, inHg, atm, torr	Y01
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	Y16
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	Y17
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	Y21
Local display Scaling with standard units [m ³ /s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m ³ , l, hl, in ³ , ft ³ , yd ³ , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm ³ , NI.	Y22
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	Y32
ID number of special design Input field: max. 4 characters and only natural numbers from 0 ... 9999	Y99

¹⁾ Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Pressure Measurement

Pressure transmitters

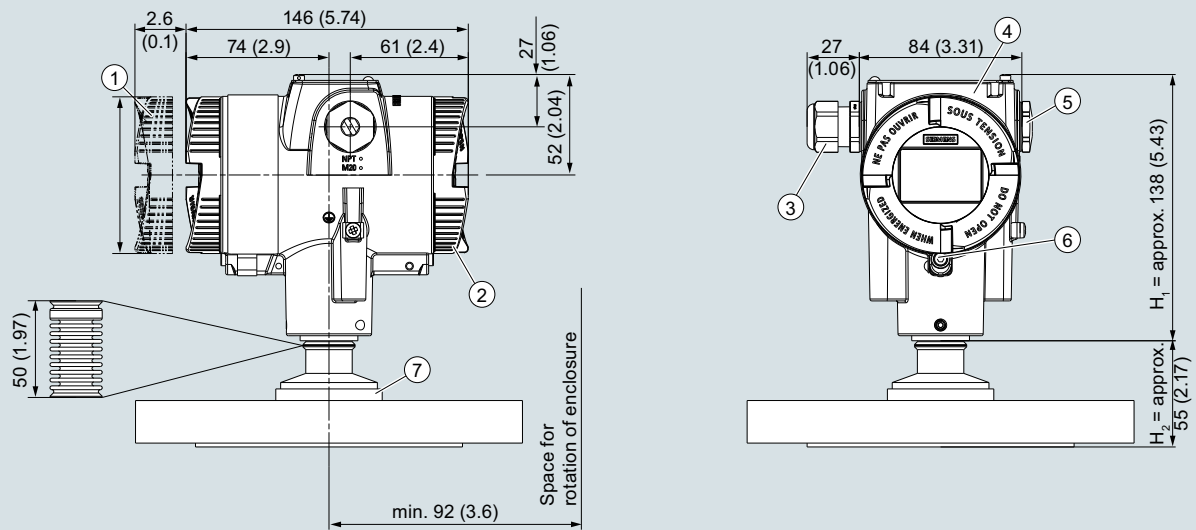
for applications with advanced requirements (Advanced)

SITRANS P320/P420

for gauge and absolute pressure, flush-mounted diaphragm

1

Dimensional drawings



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

② Connection side

③ Electrical connection:

- M20 x 1,5³⁾ screw gland
- ½-14 NPT screw gland
- Han 7D/Han 8D²⁾ device plug
- M12 device plug²⁾ ³⁾

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

²⁾ Not with "flameproof enclosure" type of protection

³⁾ Not with type of protection "FM + CSA" [is + XP]"

④ Cover over buttons and nameplate
with general information

⑤ Blanking plug

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

⑦ Process connection

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

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

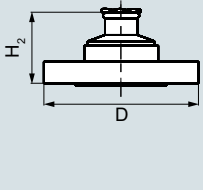
In this figure, the height is divided into H₁ and H₂.

H₁ = Height of the SITRANS P320/P420 up to a defined cross-section

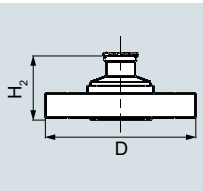
H₂ = Height of the flange up to this defined cross-section

Only the height H₂ is indicated in the dimensions of the flanges.

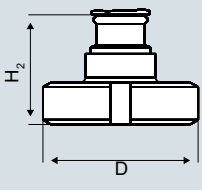
Flanges according to EN and ASMEFlange according to EN

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

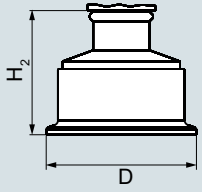
Flange according to ASME

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

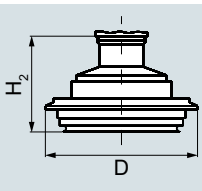
NuG and pharmaceutical connectionsConnections to DIN

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

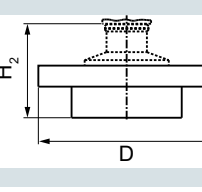
Tri-Clamp according to DIN 32676

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

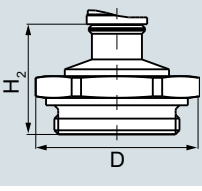
Other connections

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

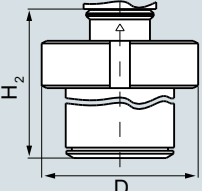
Sanitary process connection according to DRD

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

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

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

Tank connection TG 52/50 and TG52/150

	Order code	DN	PN	ØD	H ₂
	Q00	25	40	63 mm (2.5 inch)	Approx. 63 mm (2.5 inch)
	Q01	25	40	63 mm (2.5 inch)	

Pressure Measurement

Pressure transmitters

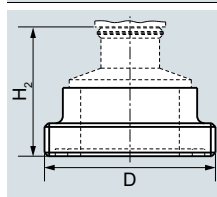
for applications with advanced requirements (Advanced)

SITRANS P320/420

for gauge and absolute pressure, flush-mounted diaphragm

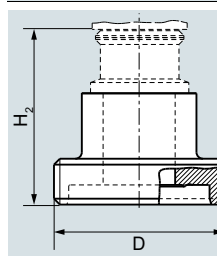
1

SMS threaded socket



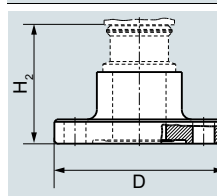
Order code	DN	PN	ØD	H ₂
Q28	2 inch	25	70 x 1/6 mm	Approx. 52 mm (2.1 inch)
Q29	2½ inch	25	85 x 1/6 mm	
Q30	3 inch	25	98 x 1/6 mm	

Aseptic threaded socket according to DIN 11864-1 Form A



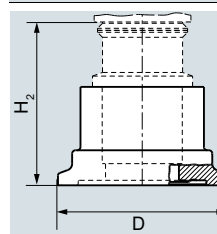
Order code	DN	PN	ØD	H ₂
N33	50	25	78 x 1/6 inch	Approx. 52 mm (2.1 inch)
N34	65	25	95 x 1/6 inch	
N35	80	25	110 x ¼ inch	
N36	100	25	130 x ¼ inch	

Aseptic flange with notch to DIN 11864-2 Form A



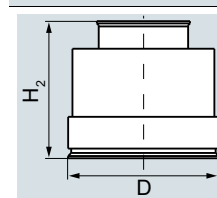
Order code	DN	PN	ØD	H ₂
N43	50	16	94 (3.7 inch)	Approx. 52 mm (2.1 inch)
N44	65	16	113 (4.4 inch)	
N45	80	16	133 (5.2 inch)	
N46	100	16	159 (6.3 inch)	

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



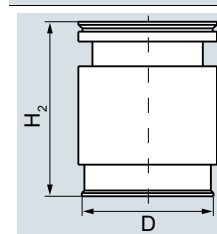
Order code	DN	PN	ØD	H ₂
N53	50	25	77.5 (3.1 inch)	Approx. 52 mm (2.1 inch)
N54	65	25	91 (3.6 inch)	
N55	80	16	106 (4.2 inch)	
N56	100	16	130 (5.1 inch)	

Process connection PMC Style Standard



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

Process connection PMC Style Minibolt



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

Technical specifications

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

Input

Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar a 0.83 ... 25 kPa a 3.3 ... 100.5 inH ₂ O a	4 bar a 0.4 MPa a 58 psi a	6 bar a 0.6 MPa a 87 psi a
	43 ... 1300 mbar a 4.3 ... 130 kPa a 17.3 ... 522 inH ₂ O a	6.6 bar a 0.66 MPa a 95 psi a	10 bar a 1 MPa a 145 psi a
	166 ... 5000 mbar a 16.6 ... 500 kPa a 2.41 ... 72.5 psi a	20 bar a 2 MPa a 290 psi a	30 bar a 3 MPa a 435 psi a
	1 ... 30 bar a 0.1 ... 3 MPa a 14.5 ... 435 psi a	65 bar a 6.5 MPa a 942 psi a	100 bar a 10 MPa a 1450 psi a
	5.3 ... 160 bar a 0.53 ... 16 MPa a 77 ... 2321 psi a	240 bar 24 MPa 3481 psi	380 bar a 38 MPa a 5511 psi a
	13.3 ... 400 bar a 1.3 ... 40 MPa a 192 ... 5802 psi a	400 bar a 40 MPa a 5802 psi a	600 bar a 60 MPa a 8702 psi a
	23.3 ... 700 bar a 2.3 ... 70 MPa a 337 ... 10153 psi a	800 bar a 80 MPa a 11603 psi a	800 bar a 80 MPa a 11603 psi a
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	0 mbar a/kPa a/psi a		
- Measuring cell with inert oil	For medium temperature -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)		30 mbar a/3 kPa a/0.44 psi a
	For medium temperature 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))		30 mbar a + 20 mbar a · (ϑ - 60 °C)/°C 3 kPa a + 2 kPa a · (ϑ - 60 °C)/°C 0.44 psi a + 0.29 psi a · (ϑ - 140 °F)/°F
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		

Output

Output signal	HART		
• Lower saturation limit (infinitely adjustable)	4 ... 20 mA		
• Upper 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		
	$I_{pp} \leq 0.5\%$ of max. output current		
Adjustable damping	0 ... 100 s, continuously adjustable over remote operation		
	0 ... 100 s, in increments of 0.1 s, adjustable over display		
• Current transmitter	3.55 ... 22.8 mA		
• Failure signal	3.55 ... 22.8 mA (factory preset to 3.55 mA)		
Load	Resistance R [Ω]		
• Without HART communication	$R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$, U_H : Power supply in V		
• With HART communication	$R = 230 \dots 1100 \text{ } \Omega$ (HART communicator (handheld)) $R = 230 \dots 500 \text{ } \Omega$ (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for absolute pressure (pressure series)

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

Measuring accuracy

Reference conditions

- According to IEC 62828-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, Turn-Down)

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

- Linear characteristic curve (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
- 160 bar a/16 MPa a/2321 psi a
- 400 bar a/40 MPa a/5802 psi a
- 700 bar a/70 MPa a/10153 psi a

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

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

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

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

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

Approx. 0.105 s

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

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

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

Operating conditions

Medium temperature

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

-40 ... +100 °C (-40 ... +212 °F)

-20 ... +100 °C (-4 ... +212 °F)

Ambient conditions

- Ambient temperature/enclosure
 - Measuring cell with silicone oil filling
 - Measuring cell with inert filling liquid
 - 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 hazardous areas.

-40 ... +85 °C (-40 ... +185 °F)

-40 ... +85 °C (-40 ... +185 °F)

-20 ... +80 °C (-4 ... +176 °F)

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

4K4H

IP66, IP68

Type 4X

According to IEC 61326 and NAMUR NE 21

Structural design

Weight

Approx. 1.8 kg (3.9 lb) with aluminum enclosure
Approx. 3.9 kg (8.3 lb) with stainless steel enclosure

Material

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

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

- Mounting bracket

- 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 nameplate (1.4404/316L)

Zinc-plated steel or stainless steel

Process connection

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

Electrical connection

Cable entry via the following screwed glands:

- M20 x 1.5
- 1/2-14 NPT
- Device plug Han 7D/Han 8D¹⁾
- Device plug M12

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

Buttons

4 buttons for operation directly on the device

Display

- With or without integrated display (optional)
- Lid 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 mod

Ripple

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

Noise

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

Auxiliary power

–

Separate supply voltage

–

Certificates and approvals

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

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

Drinking water

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

No.: 1903094 (option E83)

No.: 18 ACC LY 277 (option E85)

No.: 20180920-MH61350 (option E84)

CRN (Canada)

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

Explosion protection acc. to NEPSI (China)

No.: GYJ19.1058X (option E27)

Explosion protection acc. to INMETRO (Brazil)

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

Explosion protection

- Intrinsic safety "i"

- Marking

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

- Permissible ambient temperature

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

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

- Permissible medium temperature

-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 medium temperature

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

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

- Connection

To circuit with the operating values

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

- Dust explosion protection for Zones 21, 22

- Marking

Ex II 2D Ex tb IIIC T120 °C Db

Ex II 3D Ex tc IIIC T120 °C Dc

- Permissible ambient temperature

-40 ... +80 °C (-40 ... +176 °F)

- Permissible medium temperature

-40 ... +100 °C (-40 ... +212 °F)

- Max. surface temperature

120 °C (248 °F)

- Connection

To circuit with the operating values

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

- Dust explosion protection for Zones 20, 21, 22

- Marking

Ex II 1D Ex ia IIIC T120 °C Da

Ex II 2D Ex ib IIIC T120 °C Db

- Permissible ambient temperature

-40 ... +80 °C (-40 ... +176 °F)

- Permissible medium temperature

-40 ... +100 °C (-40 ... +212 °F)

- 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

- Type of protection for Zone 2

- Marking

Ex II 3G Ex ec IIC T4/T6 Gc

- Permissible ambient temperature "ec"

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

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

- Permissible medium temperature

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

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

- "ec" connection

To circuit with the operating values

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

- 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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for absolute pressure (pressure series)

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

NAMUR recommendations

- NE 06
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

Standardized Electrical Signals and Questions Relating to Engineering Technology
Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
Extra Low Voltage Circuits with Safe Separation
Standardization of the Signal Level for the Failure Information of Digital Transmitters
Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
The Application of the Pressure Equipment Directive to Process Control Devices
Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
Self-Monitoring and Diagnosis of Field Devices
NAMUR Standard Device - Field Devices for Standard Applications

¹⁾ Han 8D is identical to Han 8U.

Communication

HART

HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM

PROFIBUS PA

Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	
- Limit monitoring	Can be reset, preset, optional direction of counting, simulation function of register output
• Physical block	One upper and lower warning limit and one alarm limit respectively
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

FOUNDATION Fieldbus

Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	
• Physical block	Standard FOUNDATION Fieldbus function block
Transducer blocks	1 resource block
• Pressure transducer block	
- Can be calibrated by applying two pressures	1 transducer block Pressure with calibration, 1 transducer block LCD
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Yes
	Constant value or by means of parameterizable ramp function

Selection and ordering data

Article No.	
Pressure transmitters for absolute pressure (pressure series)	
SITRANS P320	7MF032 - - - - -
SITRANS P420	7MF042 - - - - -
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	0
PROFIBUS PA	1
FOUNDATION Fieldbus (FF)	2
Measuring cell filling	
Silicone oil	1
Inert filling liquid	3
Maximum measuring span	
250 mbar a (100.5 inH ₂ O a)	F
1 300 mbar a (522 inH ₂ O a)	L
5 000 mbar a (72.5 psi a)	P
30 bar a (435 psi a)	R
160 bar a (2 321 psi a)	V
400 bar a (5 802 psi a)	W
700 bar a (10 153 psi a)	X
Process connection	
Male thread M20 x 1.5	B
Male thread G½ (DIN EN 837-1)	D
Female thread ½-14 NPT	E
Male thread ½-14 NPT	F
Oval flange, mounting thread: 7/16-20 UNF (IEC 61518)	G
Oval flange, mounting thread: M10 (DIN 19213)	H
Oval flange, mounting thread: M12 (DIN 19213)	J
Version for diaphragm seal pressure	U
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404	0
Stainless steel 316L/1.4404, alloy C276/2.4819	1
Alloy C22/2.4602, alloy C276/2.4819	2
Non-wetted parts materials	
Die-cast aluminum	1
Stainless steel precision casting CF3M/1.4409 similar to 316L	2
Enclosure	
Dual chamber device	5
Type of protection	
Without Ex	A
Intrinsic safety	B
Flameproof enclosure	C
Flameproof enclosure, intrinsic safety	D
Dust protection by enclosure Zone 21/22 (DIP), increased safety Zone 2	L
Dust protection by enclosure Zone 20/21/22 (DIP), increased safety Zone 2	M
Combination of options B, C and L (zone model)	S
Combination of options B, C and M (zone model, Class Division)	T
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	F
• 2 x ½-14 NPT	M
Local operation/display	
Without display (lid closed)	0
With display (lid closed)	1
With display (lid with glass pane)	2

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for absolute pressure (pressure series)

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Options	Order code	Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.		Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included		Device options	
Plastic	A00	PDF file with device settings	D10
Metal	A01	Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	D20
Stainless steel	A02	FVMQ enclosure sealing	D21
Stainless steel 316L/1.4404	A03	Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	D30
CMP, for XP devices	A10	Unlabeled TAG plate	D40
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11	Without labeling of the measuring range on the TAG plate	D41
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12	Stainless steel Ex plate 1.4404/316L	D42
Device plug Han mounted left		Overvoltage protection up to 6 kV (internal)	D70
Device plug Han 7D (plastic, straight)	A30	Overvoltage protection up to 6 kV (external)	D71
Device plug Han 7D (plastic, angled)	A31	Labels on transport packaging (provided by customer)	D90
Device plug Han 7D (metal, straight)	A32		
Device plug Han 7D (metal, angled)	A33	General approval without Ex approval	
Device plug Han 8D (plastic, straight)	A34	Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Device plug Han 8D (plastic, angled)	A35	Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
Device plug Han 8D (metal, straight)	A36	CSA (USA and Canada)	E06
Device plug Han 8D (metal, angled)	A37	EAC	E07
Cable socket included		FM	E08
Plastic, for device plug Han 7D and Han 8D	A40	KCC	E09
Metal, for device plug Han 7D and Han 8D	A41	Explosion protection approvals	
Device plug M12 mounted left		ATEX (Europe)	E20
Stainless steel, without cable socket	A62	CSA (USA and Canada) ¹⁾	E21
Stainless steel, with cable socket	A63	FM (USA and Canada) ¹⁾	E22
Cable entry/device plug mounting		IECEX (Worldwide)	E23
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90	EACEx (GOST-R, -K, -B)	E24
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91	INMETRO (Brazil)	E25
Cable gland/device plug mounted left	A97	KCs (Korea)	E26
Cable gland/device plug mounted right	A99	NEPSI (China)	E27
Nameplate labeling (standard labeling: English, unit bar)		PESO (India)	E28
German (bar)	B11	UKR Sepro (Ukraine)	E30
French (bar)	B12	ATEX (Europe) and IECEx (Worldwide)	E47
Spanish (bar)	B13	CSA (Canada) and FM (USA) ¹⁾	E48
Italian (bar)	B14	ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) ¹⁾	E49
Chinese (bar)	B15	Marine approvals	
Russian (bar)	B16	DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
English (psi)	B20	LR (Lloyds Register)	E51
English (Pa)	B30	BV (Bureau Veritas)	E52
Chinese (Pa)	B35	ABS (American Bureau of Shipping)	E53
Certificates		RMR (Russian Maritime Register)	E55
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	C11	KR (Korean Register of Shipping)	E56
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12	RINA (Registro Italiano Navale)	E57
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	C13	CCS (China Classification Society)	E58
Factory certificate (EN 10204-2.2) - Wetted parts	C14	Country-specific approvals	
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15	CRN approval Canada (Canadian Registration Number)	E60
Certificates for functional safety			
Functional Safety (IEC 61508) - SIL2/3	C20		

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for absolute pressure (pressure series)

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

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Device settings	
Measuring span	Y01
Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm², kg/cm², kgf/cm², inH₂O, inH₂O (4°C), ftH₂O, mmH₂O, mmH₂O (4°C), mH₂O (4°C), mmHg, inHg, atm, torr	
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Input field: Free text, max. 32 characters	
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
Input field: Free text, max. 32 characters	
TAG short (device parameters, max. 8 characters)	Y17
Input field: Free text, max. 8 characters	
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	Y21
Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	
Local display Scaling with standard units [m³/s, l/s, m, inch, ...], example 1 ... 5 m	Y22
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Drop-down list: m, cm, mm, in, ft, m³, l, hl, in³, ft³, yd³, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm³, NI.	
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot).	
Input field 3: Free text, max. 8 characters	
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	Y30
Drop-down list 1: 3.9, 4	
Drop-down list 2: 20.8, 22	
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	Y31
Drop-down list: 3.75; 21.75; 22.5; 22.6	
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	Y32
Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	
ID number of special design	Y99
Input field: max. 4 characters and only natural numbers from 0 ... 9999	

¹⁾ Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Pressure Measurement

Pressure transmitters

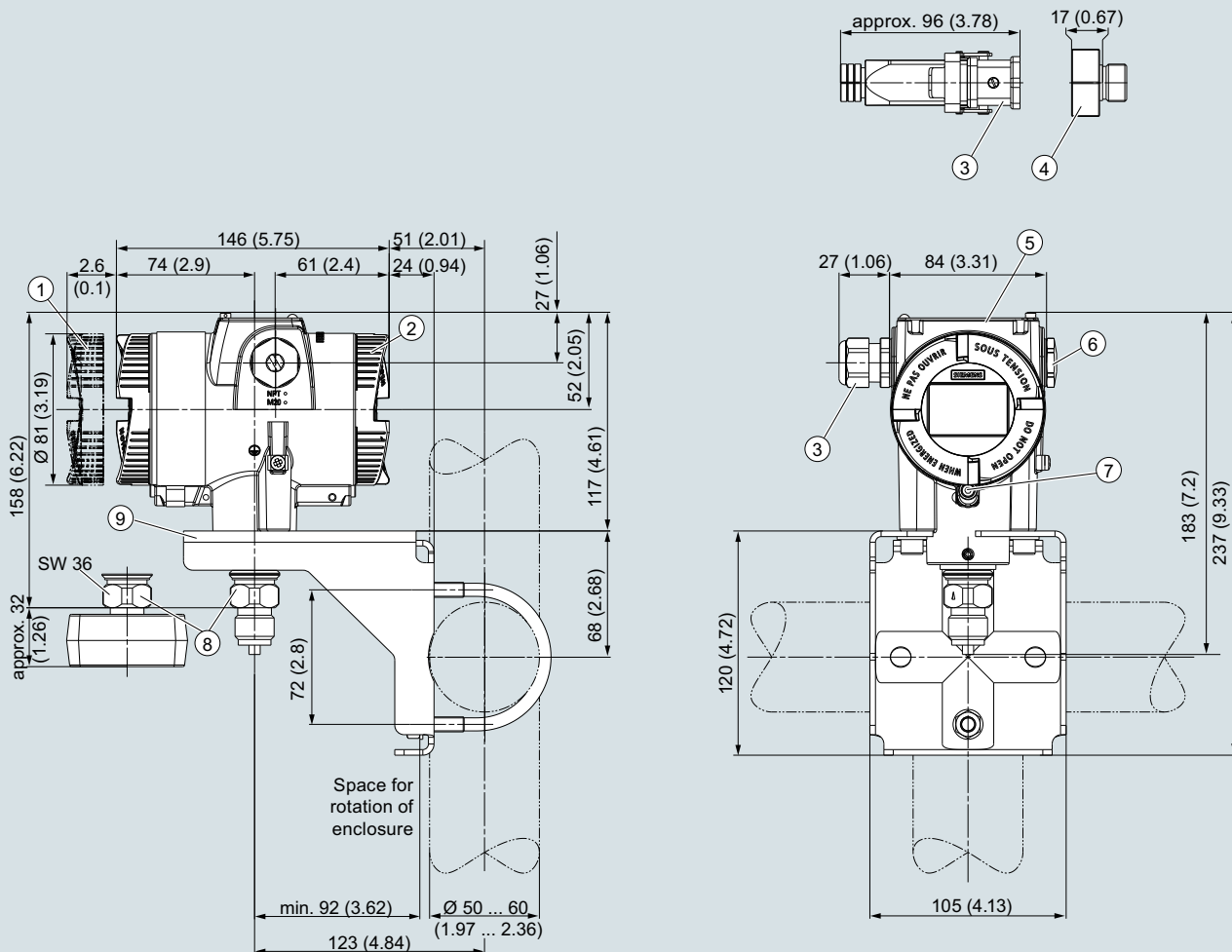
for applications with advanced requirements (Advanced)

SITRANS P320/420

for absolute pressure (pressure series)

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Dimensional drawings



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

② Connection side

③ Electrical connection:
 • M20 x 1.5³⁾ screw gland
 • ½-14 NPT screw gland
 • Han 7D/Han 8D^{2) 3)} device plug
 • M12 device plug^{2) 3)}

④ Harting adapter

⑤ Cover over buttons and nameplate
with general information

⑥ Blanking plug

⑦ Safety catch
(only for "flameproof enclosure" type of protection)

⑧ Process connection: G½B connection pin or oval flange

⑨ Mounting bracket (optional)

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

²⁾ Not with "flameproof enclosure" type of protection

³⁾ Not with type of protection "FM + CSA" [is + XP]

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

Technical specifications

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

Input

Measured variable	Absolute pressure		
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	8.3 ... 250 mbar a	160 bar a	240 bar a
	0.83 ... 25 kPa a	16 MPa a	24 MPa a
	3.3 ... 100.5 inH ₂ O a	2 320 psi a	3 481 psi a
	43 ... 1300 mbar a	160 bar a	240 bar a
	4.3 ... 130 kPa a	16 MPa a	24 MPa a
	17.3 ... 522 inH ₂ O a	2 320 psi a	3 481 psi a
	166 ... 5 000 mbar a	160 bar a	240 bar a
	16.6 ... 500 kPa a	16 MPa a	24 MPa a
	2.41 ... 72.5 psi a	2 320 psi a	3 481 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	2 320 psi a	3 481 psi a
	8 ... 160 bar	160 bar a	240 bar a
	0.8 ... 16 MPa	16 MPa a	24 MPa a
116 ... 2 320 psi	2 320 psi a	3 481 psi a	
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling			
- Measuring cell with inert liquid			
	0 mbar a/kPa a/psi a		
	For medium temperature -20 °C < $\vartheta \leq +60$ °C (-4 °F < $\vartheta \leq +140$ °F)	30 mbar a/3 kPa a/0.44 psi a	
	For medium temperature 60 °C < $\vartheta \leq +100$ °C (max. 85 °C for measuring cell 30 bar) (140 °F < $\vartheta \leq +212$ °F (max. 185 °F for measuring cell 435 psi))	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	
• 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/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		

Output

Output signal	HART		
• Lower saturation limit (infinitely adjustable)	4 ... 20 mA		
• Upper 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		
	$I_{pp} \leq 0.5\%$ 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	Resistance R [Ω]		
• Without HART communication	$R = (U_H - 10.5 \text{ V})/22.8 \text{ mA}$, U_H : Power supply in V		
• With HART communication	$R = 230 \dots 1100 \text{ } \Omega$ (HART communicator (handheld)) $R = 230 \dots 500 \text{ } \Omega$ (SIMATIC PDM)		
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		

Measuring accuracy

Reference conditions	• According to IEC 62828-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	$r = \text{max. measuring span/set measuring span and nominal measuring range}$

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for absolute pressure (differential pressure series)

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

- Linear characteristic curve 250 mbar/25 kPa/3.63 psi 1 300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar/16 MPa/2 320 psi	$r \leq 5:$ $5 < r \leq 30:$ $r \leq 5:$ $5 < r \leq 30:$ $r \leq 5:$ $5 < r \leq 20:$	$\leq 0.075\%$ $\leq (0.02 \cdot r + 0.05)\%$ $\leq 0.075\%$ $\leq (0.005 \cdot r + 0.05)\%$ $\leq 0.075\%$ $\leq (0.005 \cdot r + 0.05)\%$
Influence of ambient temperature (in % per 28 °C (50 °F)) 250 mbar a/25 kPa a/3.6 psi a 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2 320 psi a	$\leq (0.1 \cdot r + 0.1)\%$ $\leq (0.0025 \cdot r + 0.125)\%$	
Long-term stability at ± 30 °C (± 54 °F) 250 mbar a/25 kPa a/3.6 psi a 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2 320 psi a	In 5 years $\leq (0.2 \cdot r)\%$ In 5 years $\leq (0.1 \cdot r)\%$ In 10 years $\leq (0.15 \cdot r)\%$	
Step response time T_{63} (without electrical damping) 250 mbar a/25 kPa a/3.6 psi a 1300 mbar a/130 kPa a/18.8 psi a 5 bar a/500 kPa a/72.5 psi a 30 bar a/3000 kPa a/435 psi a 160 bar a/16 MPa a/2 320 psi a	Every 0.135 s	
Effect of mounting position (in pressure per change of angle)	≤ 0.7 mbar/0.07 kPa/0.010 psi per 10° incline (zero offset is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	
Operating conditions		
Medium temperature - Measuring cell with silicone oil filling - Measuring cell 30 bar (435 psi) - Measuring cell 160 bar (2 320 psi) - Measuring cell with inert oil - In conjunction with dust explosion protection	-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -40 ... +85 °C (-4 ... +185 °F)	
Ambient conditions - Ambient temperature/enclosure - Measuring cell with silicone oil filling - Measuring cell with inert oil - Display - Storage temperature - Climatic class in accordance with IEC 60721-3-4 - Degree of protection - According to IEC 60529 - According to NEMA 250 - Electromagnetic compatibility - Emitted interference and interference immunity	Observe the temperature class in hazardous areas. -40 ... +85 °C (-40 ... +185 °F) -40 ... +85 °C (-40 ... +185 °F) -20 ... +80 °C (-4 ... +176 °F) -50 ... +85 °C (-58 ... +185 °F); with FDA-compliant oil: -20 ... +85 °C (-4 ... +185 °F) 4K4H IP66, IP68 Type 4X According to IEC 61326 and NAMUR NE 21	
Structural design		
Weight	Approx. 3.9 kg (8.5 lb) with aluminum enclosure Approx. 5.8 kg (12.7 lb) with stainless steel enclosure	
Material - Wetted parts materials - Seal diaphragm - Process flanges and sealing plugs - O-ring - Non-wetted parts materials - Electronics enclosure - Process flange screws - Mounting bracket	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360 FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR • Low-copper die-cast aluminum GD-AISI 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel nameplate (1.4404/316L) Stainless steel ISO 3506-1 A4-70 Steel, zinc-plated steel, or stainless steel	
Process connection	1/4-18 NPT female thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6092 psi))	
Electrical connection	Screw terminals Cable entry via the following screwed glands: - M20 x 1.5 1/2-14 NPT - Device plug Han 7D/Han 8D¹⁾ - Device plug M12	

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

Buttons

4 buttons for operation directly on the device

Display

- With or without integrated display (optional)
- Lid 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 mod

Ripple

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

Noise

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

Auxiliary power

–

Separate supply voltage

–

Certificates and approvals

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

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

Drinking water

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

No.: 1903094 (option E83)

No.: 18 ACC LY 277 (option E85)

No.: 20180920-MH61350 (option E84)

CRN (Canada)

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

Explosion protection acc. to NEPSI (China)

No.: GYJ19.1058X (option E27)

Explosion protection acc. to INMETRO (Brazil)

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

Explosion protection

- Intrinsic safety "i"

- Marking
- Permissible ambient temperature

- Permissible medium temperature

- Connection

- Effective internal inductance/capacitance

- Flameproof enclosure "d"

- Marking
- Permissible ambient temperature

- Permissible medium temperature

- Connection

- Dust explosion protection for zones 21, 22

- Marking

- Permissible ambient temperature
- Permissible medium temperature

- Max. surface temperature

- Connection

- Dust explosion protection for Zones 20, 21, 22

- Marking

- Permissible ambient temperature
- Permissible medium temperature

- Connection

- Effective internal inductance/capacitance

- Type of protection for Zone 2

- Marking

- Permissible ambient temperature "ec"

- Permissible medium temperature

- "ec" connection

- Explosion protection acc. to FM

- Marking (XP/DIP) or IS; NI; S

- Explosion protection according to CSA

- Marking (XP/DIP) or (IS)

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

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 circuit with the operating values
 $U_n = 10.5 \dots 45 \text{ V}$, $I_n = 20 \text{ mA}$

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

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

Ex II 3G Ex ec IIC T4/T6 Gc
 -40 ... +80 °C (-40 ... +176 °F) temperature class T4
 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
 -40 ... +100 °C (-40 ... +212 °F) temperature class T4
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
 To circuit with the operating values
 $U_n = 10.5 \dots 30 \text{ V}$, $I_n = 20 \text{ mA}$

Available soon
 CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

Available soon
 CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for absolute pressure (differential pressure series)

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

NAMUR recommendations

- NE 06
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

Standardized Electrical Signals and Questions Relating to Engineering Technology
Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
Extra Low Voltage Circuits with Safe Separation
Standardization of the Signal Level for the Failure Information of Digital Transmitters
Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
The Application of the Pressure Equipment Directive to Process Control Devices
Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices
Self-Monitoring and Diagnosis of Field Devices
NAMUR Standard Device - Field Devices for Standard Applications

¹⁾ Han 8D is identical to Han 8U.

Communication

HART		FOUNDATION Fieldbus	
HART	230 ... 1 100 Ω	Device profile	FF ITK 6
Protocol	HART 7	Function blocks	3 function blocks analog input, 1 function block PID
Software for computer	SIMATIC PDM	• Analog input - Adaptation to user-specific process variable - Electrical damping adjustable - Simulation function - Response to failure - Limit monitoring - Square-rooted characteristic curve for flow measurement • PID • Physical block	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input (can be locked within the device with a bridge) Parameterizable (last good value, substitute value, incorrect value) Yes, one upper and lower warning limit and one alarm limit respectively Yes
PROFIBUS PA		Transducer blocks	
Simultaneous communication with master class 2 (max.)	4	• Pressure transducer block - Can be calibrated by applying two pressures - Monitoring of sensor limits - Simulation function: pressure measurement, sensor temperature and electronics temperature	Standard FOUNDATION Fieldbus function block 1 resource block 1 transducer block Pressure with calibration, 1 transducer block LCD
The address can be set using	Configuration tool or local operation (standard setting address 126)		
Cyclic data usage			
• Output byte • Input byte	≤ 35 (7 measured values) 0, 1, or 2 (register operating mode and reset function for dosing)		
Internal preprocessing			
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX		
Number of function blocks	7		
• Analog input - Adaptation to user-specific process variable - Electrical damping adjustable - Simulation function - Limit monitoring • Register (totalizer) - Limit monitoring • Physical block	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input Yes, one upper and lower warning limit and one alarm limit respectively Can be reset, preset, optional direction of counting, simulation function of register output One upper and lower warning limit and one alarm limit respectively 1		
Transducer blocks	1		
• Pressure transducer block - Can be calibrated by applying two pressures - Monitoring of sensor limits - Specification of a vessel characteristic with - Square-rooted characteristic curve for flow measurement - Tank characteristic curve for volume measurement - Low flow cut-off and implementation point of square-root extraction - Simulation function for measured pressure value and sensor temperature	Yes Yes Max. 30 nodes Yes Yes Parameterizable Constant value or by means of parameterizable ramp function		

Selection and ordering data

Article No.

Pressure transmitters for absolute pressure (differential pressure series)

SITRANS P320

7MF033 - - - - -

SITRANS P420

7MF043 - - - - -

[Click on the Article No. for the online configuration in the PIA Life Cycle Portal.](#)

Communication

HART, 4 ... 20 mA

PROFIBUS PA

FOUNDATION Fieldbus (FF)

Measuring cell filling

Silicone oil

Inert filling liquid

Maximum measuring span

250 mbar a (100.5 inH₂O a)1 300 mbar a (522 inH₂O a)

5 000 mbar a (72.5 psi a)

30 bar a (435 psi a)

160 bar (2 320 psi)

Process connection

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

Oval flange, mounting thread: M10 (DIN 19213)

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

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

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

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

Wetted parts materials: Process connection, seal diaphragm

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

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

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

Tantalum/tantalum, process flange stainless steel 316/1.4408

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

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

Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

Enclosure

Dual chamber device

Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

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

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

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

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

Electrical connections/cable entries

Thread for cable gland: Cable gland must be ordered separately as option (Axx)

• 2 x M20 x 1.5

• 2 x 1/2-14 NPT

Local operation/display

Without display (lid closed)

With display (lid closed)

With display (lid with glass pane)

0

1

2

1

3

G

L

P

R

Y

Q

R

S

T

V

W

0

1

2

4

6

8

1

2

5

A

B

C

D

L

M

S

T

F

M

0

1

2

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for absolute pressure (differential pressure series)

1

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	A00
Metal	A01
Stainless steel	A02
Stainless steel 316L/1.4404	A03
CMP, for XP devices	A10
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	A30
Device plug Han 7D (plastic, angled)	A31
Device plug Han 7D (metal, straight)	A32
Device plug Han 7D (metal, angled)	A33
Device plug Han 8D (plastic, straight)	A34
Device plug Han 8D (plastic, angled)	A35
Device plug Han 8D (metal, straight)	A36
Device plug Han 8D (metal, angled)	A37
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	A40
Metal, for device plug Han 7D and Han 8D	A41
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91
Cable gland/device plug mounted left	A97
Cable gland/device plug mounted right	A99
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13
Italian (bar)	B14
Chinese (bar)	B15
Russian (bar)	B16
English (psi)	B20
English (Pa)	B30
Chinese (Pa)	B35
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	C11
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	C13
Factory certificate (EN 10204-2.2) - Wetted parts	C14
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	D10
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	D30
Unlabeled TAG plate	D40
Without labeling of the measuring range on the TAG plate	D41
Stainless steel Ex plate 1.4404/316L	D42
Overvoltage protection up to 6 kV (internal)	D70
Overvoltage protection up to 6 kV (external)	D71
Labels on transport packaging (provided by customer)	D90
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KCC	E09
Explosion protection approvals	
ATEX (Europe)	E20
CSA (USA and Canada) ¹⁾	E21
FM (USA and Canada) ¹⁾	E22
IECEX (Worldwide)	E23
EACEx (GOST-R, -K, -B)	E24
INMETRO (Brazil)	E25
KCs (Korea)	E26
NEPSI (China)	E27
PESO (India)	E28
UKR Sepro (Ukraine)	E30
ATEX (Europe) and IECEx (Worldwide)	E47
CSA (Canada) and FM (USA) ¹⁾	E48
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) ¹⁾	E49
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
LR (Lloyds Register)	E51
BV (Bureau Veritas)	E52
ABS (American Bureau of Shipping)	E53
RMR (Russian Maritime Register)	E55
KR (Korean Register of Shipping)	E56
RINA (Registro Italiano Navale)	E57
CCS (China Classification Society)	E58
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	E60

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for absolute pressure (differential pressure series)

1

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	E80
Dual Seal	E81
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	E83
NSF61 (drinking water)	E84
ACS (drinking water)	E85
Mounting bracket	
Steel, zinc-plated	H01
Stainless steel 1.4301/304	H02
Stainless steel 1.4404/316L	H03
Process flanges; screw plug with vent valve	
Welded in on right	J08
Welded in on left	J09
Glued in on right	J10
Glued in on left	J11
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J70
• DN 50 PN 40, stainless steel 1.4571/316Ti	J71
• DN 80 PN 40, stainless steel 1.4571/316Ti	J72
• DN 15 PN 40, stainless steel 1.4571/316Ti	J78
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J73
• DN 50 PN 40, stainless steel 1.4571/316Ti	J74
• DN 80 PN 40, stainless steel 1.4571/316Ti	J75
Flange connection options	
Flange connection and temperature extension	J76
Flange connection with epoxy resin coating	J77
Process flanges; special materials	
Reserved for 7MF7: without process flanges, without screws, without gaskets	K00
Process flange material alloy C22/2.4602	K01
Process flange material Monel 400/2.4360	K02
Process connection material PVDF, on the side ½-14 NPT	K05
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	K06
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	K07
Process flanges; process connection option	
Process flange with process connection G½ welded on	K20
Process connection NAM (ASTAVA)	K21
Process flanges chambered with gaskets	
1x chambered, graphite	K40
1x chambered, PTFE	K41
2x chambered, PTFE	K42
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE	K50
O-ring, process flanges, FEP (with silicone core, approved for food)	K51
O-ring, process flanges, FFKM (FFPM)	K52
O-ring, process flanges, NBR	K53
O-ring, process flanges, EPDM	K54

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	K81
Process flanges (+) - side front	K82
Process flange screws, process flange nuts, material Monel 400/2.4360	K83
Valve ¼-18 NPT, material same as process flanges	K84
Valve mounted on the side, measured medium: Gas	K85
Oval flange attached, PTFE seal + fastening screws	K86
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U01
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U02
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U03
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U04

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

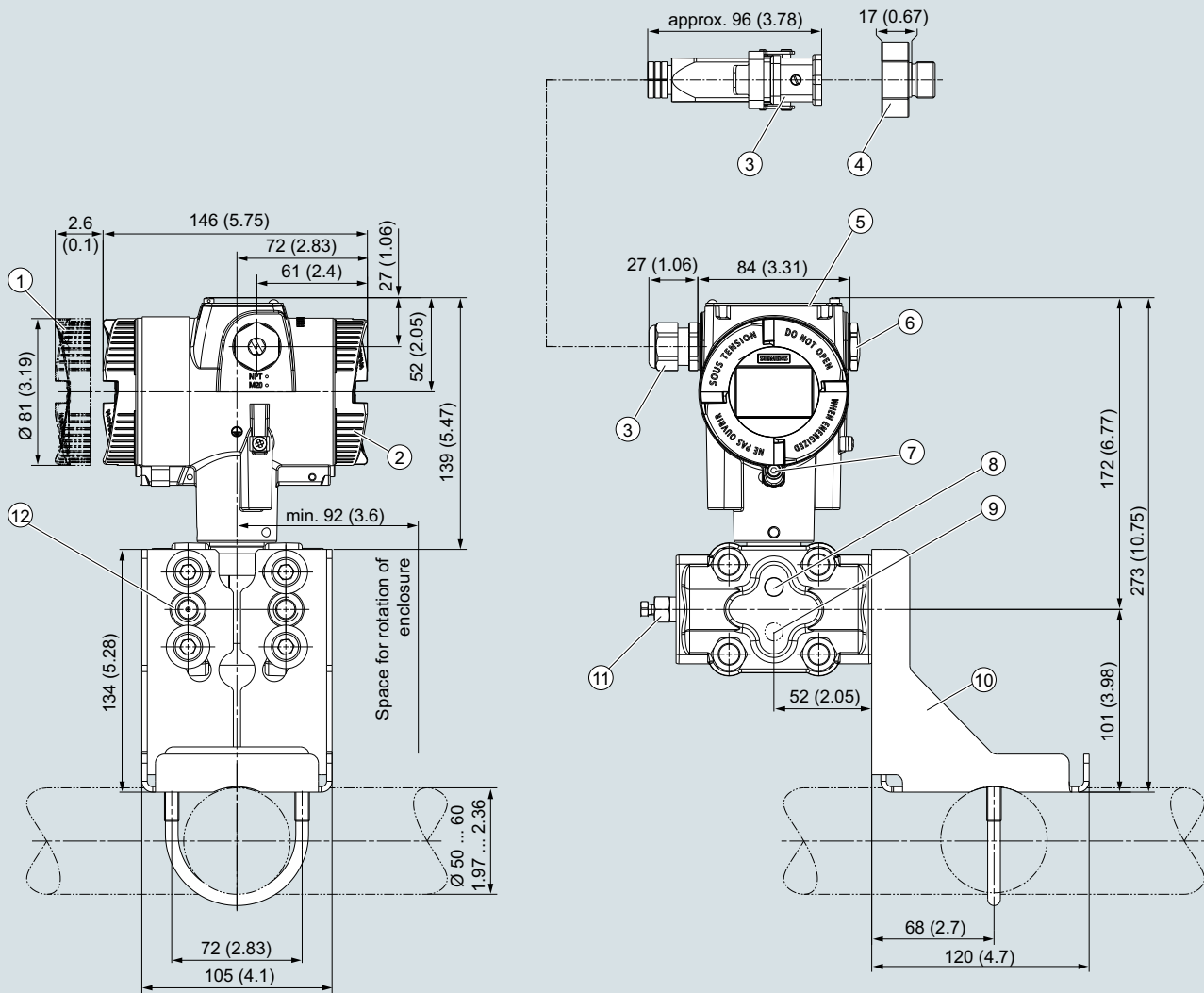
SITRANS P320/420

for absolute pressure (differential pressure series)

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm ² , kg/cm ² , kgf/cm ² , inH ₂ O, inH ₂ O (4°C), ftH ₂ O, mmH ₂ O, mmH ₂ O (4°C), mH ₂ O (4°C), mmHg, inHg, atm, torr	Y01
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	Y16
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	Y17
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	Y21
Local display Scaling with standard units [m ³ /s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m ³ , l, hl, in ³ , ft ³ , yd ³ , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm ³ , NI.	Y22
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	Y32
ID number of special design Input field: max. 4 characters and only natural numbers from 0 ... 9999	Y99

¹⁾ Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Dimensional drawings



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

② Connection side

③ Electrical connection:
• M20 x 1,5³⁾ screw gland
• ½-14 NPT screw gland
• Han 7D/Han 8D²⁾ device plug
• M12 device plug²⁾

④ Harting adapter

⑤ Cover over buttons and nameplate with general information

⑥ Blanking plug

⑦ Safety catch
(only for "flameproof enclosure" type of protection)

⑧ Lateral ventilation for liquid measurement (Standard)

⑨ Lateral ventilation for gas measurement (order option K85)

⑩ Mounting bracket (optional)

⑪ Sealing plug with valve (optional)

⑫ Process connection: ¼-18 NPT (IEC 61518)

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

²⁾ Not with "flameproof enclosure" type of protection

³⁾ Not with type of protection "FM + CSA" [is + XP]"

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for differential pressure and flow

1

Technical specifications

SITRANS P320 / SITRANS P420 for differential pressure and flow

Input

Measured variable

Differential pressure and flow

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

Measuring span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

1 ... 20 mbar
0.1 ... 2 kPa
0.4019 ... 8.037 inH₂O

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

1 ... 60 mbar
0.1 ... 6 kPa
0.4019 ... 24.11 inH₂O

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

2.5 ... 250 mbar
0.2 ... 25 kPa
1.005 ... 100.5 inH₂O

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

6 ... 600 mbar
0.6 ... 60 kPa
2.41 ... 241.1 inH₂O

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

16 ... 1600 mbar
1.6 ... 160 kPa
6.43 ... 643 inH₂O

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

50 ... 5000 mbar
5 ... 500 kPa
20.09 ... 2009 inH₂O

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

0.08 ... 160 bar
0.8 ... 16 MPa
116 ... 2 320 psi

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

0.3 ... 30 bar
0.03 ... 3 MPa
4.35 ... 435 psi

160 bar
16 MPa
2 320 psi

240 bar
24 MPa
3 481 psi

2.5 ... 250 mbar
0.25 ... 25 kPa
1.005 ... 100.5 inH₂O

420 bar
42 MPa
6 092 psi

630 bar
63 MPa
9 137 psi

6 ... 600 mbar
0.6 ... 60 kPa
2.41 ... 241.1 inH₂O

420 bar
42 MPa
6 092 psi

630 bar
63 MPa
9 137 psi

16 ... 1600 mbar
1.6 ... 160 kPa
6.43 ... 643 inH₂O

420 bar
42 MPa
6 092 psi

630 bar
63 MPa
9 137 psi

50 ... 5000 mbar
5 ... 500 kPa
20.09 ... 2009 inH₂O

420 bar
42 MPa
6 092 psi

630 bar
63 MPa
9 137 psi

0.3 ... 30 bar
0.03 ... 3 MPa
4.35 ... 435 psi

420 bar
42 MPa
6 092 psi

630 bar
63 MPa
9 137 psi

Measuring limits

- Lower measuring limit
 - Measuring cell with silicone oil filling

All measuring cells:

- -100% of max. measuring range or 30 mbar a /3 kPa a /0.44 psi a

Measuring cell 160 bar/16 MPa/2 320 psi:

- -25% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a

- Measuring cell with inert liquid

For medium temperature -20 °C < ϑ ≤ +60 °C (-4 °F < ϑ ≤ +140 °F)

-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a

For medium temperature 60 °C < ϑ ≤ +100 °C (max. 85 °C for measuring cell 30 bar with PN 420) (140 °F < ϑ ≤ +212 °F (max. 185 °F for measuring cell 435 psi))

-100% of maximum measuring range or 30 mbar a /3 kPa a /0.44 psi a

30 mbar a +
20 mbar a · (ϑ - 60 °C)/°C 3 kPa a
+ 2 kPa a · (ϑ - 60 °C)/°C 0.44 psi a
+ 0.29 psi a · (ϑ - 140 °F)/°F

- Measuring cell with FDA-compliant oil

For medium temperature -10 °C < ϑ ≤ +100 °C (-14 °F < ϑ ≤ +212 °F)

-100% of maximum measuring range or 100 mbar a /10 kPa a /14.5 psi a

- Upper measuring limit

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

- Lower range value

Between the measuring limits (infinitely adjustable)

SITRANS P320 / SITRANS P420 for differential pressure and flow**Output**

Output signal

- Lower saturation limit (infinitely adjustable)
- Upper 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

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

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

-

-

Measuring accuracy

Reference conditions

- According to IEC 62828-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, Turn-Down)

- Linear characteristic curve

- 20 mbar/2 kPa/0.29 psi

- 60 mbar/6 kPa/0.87 psi

- 250 mbar/25 kPa/3.63 psi
 600 mbar/60 kPa/8.7 psi
 1600 mbar/160 kPa/23.21 psi
 5 bar/500 kPa/72.5 psi
 30 bar/3 MPa/435 psi

- 160 bar/16 MPa/2 320 psi

- 250 mbar/25 kPa/3.63 psi (PN 160)
 600 mbar/60 kPa/8.7 psi
 1600 mbar/160 kPa/23.21 psi
 5 bar/500 kPa/72.5 psi
 30 bar/3 MPa/435 psi

- 160 bar/16 MPa/2 320 psi

- 250 mbar/25 kPa/3.63 psi (PN 420)

- Square-rooted characteristic curve (flow > 50%)

- 20 mbar/2 kPa/0.29 psi

- 60 mbar/6 kPa/0.87 psi

- 250 mbar/25 kPa/3.63 psi
 600 mbar/60 kPa/8.7 psi
 1600 mbar/160 kPa/23.21 psi
 5 bar/500 kPa/72.5 psi
 30 bar/3 MPa/435 psi

- 160 bar/16 MPa/2 320 psi

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

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for differential pressure and flow

SITRANS P320 / SITRANS P420 for differential pressure and flow

• Square-rooted characteristic curve (flow 25 ... 50%)

- 20 mbar/2 kPa/0.29 psi	$r \leq 5:$	$\leq 0.15\%$
	$5 < r \leq 20:$	$\leq (0.01 \cdot r + 0.1)\%$
- 60 mbar/6 kPa/0.87 psi	$r \leq 5:$	$\leq 0.15\%$
	$5 < r \leq 60:$	$\leq (0.01 \cdot r + 0.1)\%$
- 250 mbar/25 kPa/3.63 psi	$r \leq 5:$	$\leq 0.13\%$ (SITRANS P320)
600 mbar/60 kPa/8.7 psi		$\leq 0.08\%$ (SITRANS P420)
1600 mbar/160 kPa/23.21 psi		
5 bar/500 kPa/72.5 psi	$5 < r \leq 100:$	$\leq (0.008 \cdot r + 0.09)\%$
30 bar/3 MPa/435 psi		
- 160 bar/16 MPa/2 320 psi	$r \leq 5:$	$\leq 0.13\%$ (SITRANS P320)
		$\leq 0.08\%$ (SITRANS P420)
	$5 < r \leq 20:$	$\leq (0.008 \cdot r + 0.09)\%$

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

- 20 mbar/2 kPa/0.29 psi	$\leq (0.15 \cdot r + 0.1)\%$
- 60 mbar/6 kPa/0.87 psi	$\leq (0.075 \cdot r + 0.1)\%$
- 250 mbar/25 kPa/3.63 psi	$\leq (0.025 \cdot r + 0.125)\%$ (SITRANS P320)
600 mbar/60 kPa/8.7 psi	
1600 mbar/160 kPa/23.21 psi	
5 bar/500 kPa/72.5 psi	
30 bar/3 MPa/435 psi	
160 bar/16 MPa/2 320 psi	
- 250 mbar/25 kPa/3.63 psi	$\leq (0.025 \cdot r + 0.0625)\%$ (SITRANS P420)
5 bar/500 kPa/72.5 psi	
- 600 mbar/60 kPa/8.7 psi	$\leq (0.0125 \cdot r + 0.0625)\%$ (SITRANS P420)
1600 mbar/160 kPa/23.21 psi	
30 bar/3 MPa/435 psi	
160 bar/16 MPa/2 320 psi	

Effect of static pressure

• At the lower range value	Zero-point correction is possible with position error compensation
- 20 mbar/2 kPa/0.29 psi	$\leq (0.3 \cdot r)\%$ per 70 bar (SITRANS P320)
	$\leq (0.2 \cdot r)\%$ per 70 bar (SITRANS P420)
	$\leq (0.1 \cdot r)\%$ per 70 bar
- 60 mbar/6 kPa/0.87 psi	
250 mbar/25 kPa/3.63 psi	
600 mbar/60 kPa/8.7 psi	
1600 mbar/160 kPa/23.21 psi	
30 bar/3 MPa/435 psi	
160 bar/16 MPa/2 320 psi	
- 5 bar/500 kPa/72.5 psi	$\leq (0.15 \cdot r)\%$ per 70 bar
• on the measuring span	
- 20 mbar/2 kPa/0.29 psi	$\leq 0.2\%$ per 70 bar
- 60 mbar/6 kPa/0.87 psi	$\leq 0.1\%$ per 70 bar
250 mbar/25 kPa/3.63 psi	
600 mbar/60 kPa/8.7 psi	
1600 mbar/160 kPa/23.21 psi	
5 bar/500 kPa/72.5 psi	
30 bar/3 MPa/435 psi	
160 bar/16 MPa/2 320 psi	

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

• 20 mbar/2 kPa/0.29 psi	Static pressure max. 70 bar/7 MPa/1015 psi
• 60 mbar/6 kPa/0.87 psi	$\leq (0.2 \cdot r)\%$ per year
	In 5 years $\leq (0.25 \cdot r)\%$
• 250 mbar/25 kPa/3.63 psi	In 5 years $\leq (0.125 \cdot r)\%$
600 mbar/60 kPa/8.7 psi	In 10 years $\leq (0.15 \cdot r)\%$
1600 mbar/160 kPa/23.21 psi	
5 bar/500 kPa/72.5 psi	
160 bar/16 MPa/2 320 psi	
• 30 bar/3 MPa/435 psi	In 5 years $\leq (0.25 \cdot r)\%$
	In 10 years $\leq (0.35 \cdot r)\%$

Step response time T_{63} (without electrical damping for pressure rating PN 160)

• 20 mbar/2 kPa/0.29 psi	Approx. 0.160 s
• 60 mbar/6 kPa/0.87 psi	Approx. 0.150 s
• 250 mbar/25 kPa/3.63 psi	Approx. 0.135 s
600 mbar/60 kPa/8.7 psi	
1600 mbar/160 kPa/23.21 psi	
5 bar/500 kPa/72.5 psi	
30 bar/3 MPa/435 psi	
160 bar/16 MPa/2 320 psi	

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

≤ 0.7 mbar/0.07 kPa/0.028 inH₂O per 10° incline (zero point correction is possible with position error compensation)

Effect of auxiliary power (in % per voltage change)

0.005% per 1 V

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

Medium temperature

- Measuring cell with silicone oil filling
 - Measuring cell 30 bar (435 psi)
 - Measuring cell 160 bar (2 320 psi)
- Measuring cell with inert oil
- Measuring cell with FDA-compliant oil
- In conjunction with dust explosion protection

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

Ambient conditions

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

Observe the temperature class in hazardous areas.
 -40 ... +85 °C (-40 ... +185 °F)
 -40 ... +85 °C (-40 ... +185 °F)
 -10 ... +85 °C (14 ... +185 °F)
 -20 ... +80 °C (-4 ... +176 °F)
 -50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))
 4K4H
 IP66, IP68
 Type 4X
 According to IEC 61326 and NAMUR NE 21

Structural design

Weight

Approx. 3.9 kg (8.5 lb) with aluminum enclosure
 Approx. 5.9 kg (13 lb) with stainless steel enclosure

Material

- Wetted parts materials
 - Seal diaphragm
 - Process flanges and sealing plugs
 - O-ring
- Non-wetted parts materials
 - Electronics enclosure
 - Process flange screws
 - Mounting bracket

Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
 Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360
 FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
 • Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M
 • Standard: Powder coating with polyurethane
 Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane
 • Stainless steel nameplate (1.4404/316L)
 Stainless steel ISO 3506-1 A4-70
 Steel, zinc-plated steel, or stainless steel

Process connection

1/4-18 NPT female thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6 092 psi))

Electrical connection

Screw terminals
 Cable entry via the following screwed glands:

- M20 x 1.5
- 1/2-14 NPT
- Device plug Han 7D/Han 8D¹⁾
- Device plug M12

Displays and controls

Buttons

4 buttons for operation directly on the device

Display

- With or without integrated display (optional)
- Lid 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 mod

Ripple

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

Noise

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

Auxiliary power

—

Separate supply voltage

—

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for differential pressure and flow

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SITRANS P320 / SITRANS P420 for differential pressure and flow

Certificates and approvals

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

Drinking water

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

CRN (Canada)

Explosion protection acc. to NEPSI (China)

Explosion protection acc. to INMETRO (Brazil)

Explosion protection

- Intrinsic safety "i"
 - Marking
 - Permissible ambient temperature
 - Permissible medium temperature
 - Connection
 - Effective internal inductance/capacitance
- Flameproof enclosure "d"
 - Marking
 - Permissible ambient temperature
 - Permissible medium temperature
 - Connection
- Dust explosion protection for Zones 21, 22
 - Marking
 - Permissible ambient temperature
 - Permissible medium temperature
 - Max. surface temperature
 - Connection
- Dust explosion protection for Zones 20, 21, 22
 - Marking
 - Permissible ambient temperature
 - Permissible medium temperature
 - Connection
 - Effective internal inductance/capacitance
- Type of protection for Zone 2
 - Marking
 - Permissible ambient temperature "ec"
 - Permissible medium temperature
 - "ec" connection
- Explosion protection acc. to FM
 - Marking (XP/DIP) or IS; NI; S
- Explosion protection according to CSA
 - Marking (XP/DIP) or (IS)

NAMUR recommendations

- NE 06
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

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

For flow only

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

No.: 1903094 (option E83)

No.: 18 ACC LY 277 (option E85)

No.: 20180920-MH61350 (option E84)

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

No.: GYJ19.1058X (option E27)

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

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

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

To certified intrinsically safe circuits with peak values:

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

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

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

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

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

To circuit with the operating values

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

Ex II 2D Ex tb IIIC T120 °C Db

Ex II 3D Ex tc IIIC T120 °C Dc

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

120 °C (248 °F)

To circuit with the operating values

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

Ex II 1D Ex ia IIIC T120 °C Da

Ex II 2D Ex ib IIIC T120 °C Db

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

To certified intrinsically safe circuits with peak values:

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

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

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

Ex II 3G Ex ec IIC T4/T6 Gc

-40 ... +80 °C (-40 ... +176 °F) temperature class T4
 -40 ... +40 °C (-40 ... +104 °F) temperature class T6
 -40 ... +100 °C (-40 ... +212 °F) temperature class T4
 -40 ... +70 °C (-40 ... +158 °F) temperature class T6

To circuit with the operating values

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

Available soon

CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

Available soon

CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2, GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

Standardized Electrical Signals and Questions Relating to Engineering Technology

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

Extra Low Voltage Circuits with Safe Separation

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

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

The Application of the Pressure Equipment Directive to Process Control Devices

Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices

Self-Monitoring and Diagnosis of Field Devices

NAMUR Standard Device - Field Devices for Standard Applications

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for differential pressure and flow

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Communication

HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
PROFIBUS PA	
Simultaneous communication with master class 2 (max.)	4
The address can be set using	Configuration tool or local operation (standard setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operating mode and reset function for dosing)
Internal preprocessing	
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX
Number of function blocks	7
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively
• Physical block	1
Transducer blocks	1
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic with	Max. 30 nodes
- Square-rooted characteristic curve for flow measurement	Yes
- Tank characteristic curve for volume measurement	Yes
- Low flow cut-off and implementation point of square-root extraction	Parameterizable
- Simulation function for measured pressure value and sensor temperature	Constant value or by means of parameterizable ramp function

FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	
- Adaptation to user-specific process variable	Yes, linearly rising or falling characteristic curve
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Response to failure	Parameterizable (last good value, substitute value, incorrect value)
- Limit monitoring	Yes, one upper and lower warning limit and one alarm limit respectively
- Square-rooted characteristic curve for flow measurement	Yes
• PID	Standard FOUNDATION Fieldbus function block
• Physical block	1 resource block
Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp function

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for differential pressure and flow

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Selection and ordering data

Article No.

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

SITRANS P320

7MF034 - - - - -

SITRANS P420

7MF044 - - - - -

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

Communication

HART, 4 ... 20 mA

PROFIBUS PA

FOUNDATION Fieldbus (FF)

Measuring cell filling

Silicone oil

Inert liquid

Neobee oil

Maximum measuring span

20 mbar (8.037 inH₂O)

60 mbar (24.11 inH₂O)

250 mbar (100.5 inH₂O)

600 mbar (241.1 inH₂O)

1 600 mbar (643 inH₂O)

5 000 mbar (2009 inH₂O)

30 bar (435 psi)

160 bar (2 320 psi)

Process connection

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

Oval flange, mounting thread: M12 (PN 420) (DIN 19213)

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

Oval flange, mounting thread: M12 (PN 420) (DIN 19213) with lateral ventilation

Version for diaphragm seal with mounting thread $\frac{7}{16}$ -20 UNF (IEC 61518)

Version for diaphragm seal with mounting thread M12 (PN 420) (DIN 19213)

Version for diaphragm seal (one side mounted directly; other side with capillary line) with fastening thread $\frac{7}{16}$ -20 UNF (IEC 61518)

Wetted parts materials: Process connection, seal diaphragm

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

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

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

Tantalum/tantalum, process flange stainless steel 316/1.4408

(not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

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

(not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

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

(not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))

Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

Enclosure

Dual chamber device

Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

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

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

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

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

0

1

2

1

3

4

B

D

G

H

M

P

R

Y

L

M

N

P

V

W

X

0

1

2

4

6

8

1

2

5

A

B

C

D

L

M

S

T

Article No.									
Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)									
SITRANS P320									
SITRANS P420									
Electrical connections/cable entries									
Thread for cable gland: Cable gland must be ordered separately as option (Axx)									
• 2 x M20 x 1.5 • 2 x ½-14 NPT									
Local operation/display									
Without display (lid closed)									
With display (lid closed)									
With display (lid with glass pane)									

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for differential pressure and flow

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Article No.

Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)

SITRANS P320

7MF035 - - - - -

SITRANS P420

7MF045 - - - - -

Click the article number for online configuration in the PIA Life Cycle Portal.

Communication

HART, 4 ... 20 mA

PROFIBUS PA

FOUNDATION Fieldbus (FF)

Measuring cell filling

Silicone oil

Inert liquid

Neobee oil

Maximum measuring span

250 mbar (100.5 inH₂O)

600 mbar (241.1 inH₂O)

1 600 mbar (643 inH₂O)

5 000 mbar (2009 inH₂O)

30 bar (435 psi)

Process connection

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

Oval flange, mounting thread: M12 (PN 420) (DIN 19213)

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

Oval flange, mounting thread: M12 (PN 420) (DIN 19213) with lateral ventilation

Version for diaphragm seal with mounting thread $\frac{7}{16}$ -20 UNF (IEC 61518)

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

Version for diaphragm seal (one side mounted directly; other side with capillary line) with fastening thread $\frac{7}{16}$ -20 UNF (IEC 61518)

Wetted parts materials: Process connection, seal diaphragm

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

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

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

Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

Enclosure

Dual chamber device

Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

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

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

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

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

Electrical connections/cable entries

Thread for cable gland: Cable gland must be ordered separately as option (Axx)

• 2 x M20 x 1.5

• 2 x $\frac{1}{2}$ -14 NPT

Local operation/display

Without display (lid closed)

With display (lid closed)

With display (lid with glass pane)

0

1

2

1

3

4

G

H

M

P

R

L

M

N

P

V

W

X

0

1

8

1

2

5

A

B

C

D

L

M

S

T

F

M

0

1

2

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for differential pressure and flow

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Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	A00
Metal	A01
Stainless steel	A02
Stainless steel 316L/1.4404	A03
CMP, for XP devices	A10
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	A30
Device plug Han 7D (plastic, angled)	A31
Device plug Han 7D (metal, straight)	A32
Device plug Han 7D (metal, angled)	A33
Device plug Han 8D (plastic, straight)	A34
Device plug Han 8D (plastic, angled)	A35
Device plug Han 8D (metal, straight)	A36
Device plug Han 8D (metal, angled)	A37
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	A40
Metal, for device plug Han 7D and Han 8D	A41
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91
Cable gland/device plug mounted left	A97
Cable gland/device plug mounted right	A99
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13
Italian (bar)	B14
Chinese (bar)	B15
Russian (bar)	B16
English (psi)	B20
English (Pa)	B30
Chinese (Pa)	B35
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	C11
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	C13
Factory certificate (EN 10204-2.2) - Wetted parts	C14
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	D10
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	D30
Unlabeled TAG plate	D40
Without labeling of the measuring range on the TAG plate	D41
Stainless steel Ex plate 1.4404/316L	D42
Increase of pressure rating from PN 420 to PN 500 (Tested according to IEC 61010. Only permissible for process media of fluid group 2 acc. to DGRL. Not suitable for use with hazardous process media.)	D50
Overvoltage protection up to 6 kV (internal)	D70
Overvoltage protection up to 6 kV (external)	D71
Labels on transport packaging (provided by customer)	D90
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KCC	E09
Explosion protection approvals	
ATEX (Europe)	E20
CSA (USA and Canada) ¹⁾	E21
FM (USA and Canada) ¹⁾	E22
IECEx (Worldwide)	E23
EACEx (GOST-R, -K, -B)	E24
INMETRO (Brazil)	E25
KCs (Korea)	E26
NEPSI (China)	E27
PESO (India)	E28
UKR Sepro (Ukraine)	E30
ATEX (Europe) and IECEx (Worldwide)	E47
CSA (Canada) and FM (USA) ¹⁾	E48
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) ¹⁾	E49
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
LR (Lloyds Register)	E51
BV (Bureau Veritas)	E52
ABS (American Bureau of Shipping)	E53
RMR (Russian Maritime Register)	E55
KR (Korean Register of Shipping)	E56
RINA (Registro Italiano Navale)	E57
CCS (China Classification Society)	E58
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	E60

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for differential pressure and flow

1

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	E80
Dual Seal	E81
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	E83
NSF61 (drinking water)	E84
ACS (drinking water)	E85
Mounting bracket	
Steel, zinc-plated	H01
Stainless steel 1.4301/304	H02
Stainless steel 1.4404/316L	H03
Process flanges; screw plug with vent valve	
Welded in on right	J08
Welded in on left	J09
Glued in on right	J10
Glued in on left	J11
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J70
• DN 50 PN 40, stainless steel 1.4571/316Ti	J71
• DN 80 PN 40, stainless steel 1.4571/316Ti	J72
• DN 15 PN 40, stainless steel 1.4571/316Ti	J78
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	J73
• DN 50 PN 40, stainless steel 1.4571/316Ti	J74
• DN 80 PN 40, stainless steel 1.4571/316Ti	J75
Flange connection options	
Flange connection and temperature extension	J76
Flange connection with epoxy resin coating	J77
Process flanges; special materials	
Reserved for 7MF7: without process flanges, without screws, without gaskets	K00
Process flange material alloy C22/2.4602	K01
Process flange material Monel 400/2.4360	K02
Process connection material PVDF, on the side ½-14 NPT	K05
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	K06
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	K07
Process flanges; process connection option	
Process flange with process connection G½ welded on	K20
Process connection NAM (ASTAVA)	K21
Process flanges chambered with gaskets	
1x chambered, graphite	K40
1x chambered, PTFE	K41
2x chambered, PTFE	K42
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE	K50
O-ring, process flanges, FEP (with silicone core, approved for food)	K51
O-ring, process flanges, FFKM (FFPM)	K52
O-ring, process flanges, NBR	K53
O-ring, process flanges, EPDM	K54

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	K81
Process flanges (+) - side front	K82
Process flange screws, process flange nuts, material Monel 400/2.4360	K83
Valve ¼-18 NPT, material same as process flanges	K84
Valve mounted on the side, measured medium: Gas	K85
Oval flange attached, PTFE seal + fastening screws	K86
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U01
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U02
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U03
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	U04

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm ² , kg/cm ² , kgf/cm ² , inH ₂ O, inH ₂ O (4°C), ftH ₂ O, mmH ₂ O, mmH ₂ O (4°C), mH ₂ O (4°C), mmHg, inHg, atm, torr	Y01
Square-rooted characteristic curve [VSLN2, MSLN2], example: VSLN2 Drop-down list: VSLN2, MSLN2	Y02
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	Y16
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	Y17
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	Y21
Local display Scaling with standard units [m ³ /s, l/s, m, inch, ...], example 1 ... 5 m ³ /s Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m ³ , l, hl, in ³ , ft ³ , yd ³ , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm ³ , NI, m ³ /sec, m ³ /h, m ³ /d, l/sec, l/min, l/h, Ml/d, ft ³ /sec, ft ³ /h, ft ³ /d, SCF/min, SCF/h, NI/h, Nm ³ /h, gal/sec, gal/min, gal/h, gal/d, Mgal/d, gal (UK)/sec, gal (UK)/min, gal (UK)/h, gal (UK)/d, bbl/sec, bbl/min, bbl/h, bbl/d, kg/sec, kg/min, kg/h, kg/d, g/sec, g/min, g/h, t/min, t/h, t/d, lb/sec, lb/min, lb/h, lb/d, ton/min, ton/h, ton/d, ton (UK)/h, ton (UK)/d.	Y22
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	Y32
ID number of special design Input field: max. 4 characters and only natural numbers from 0 ... 9999	Y99

¹⁾ Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Pressure Measurement

Pressure transmitters

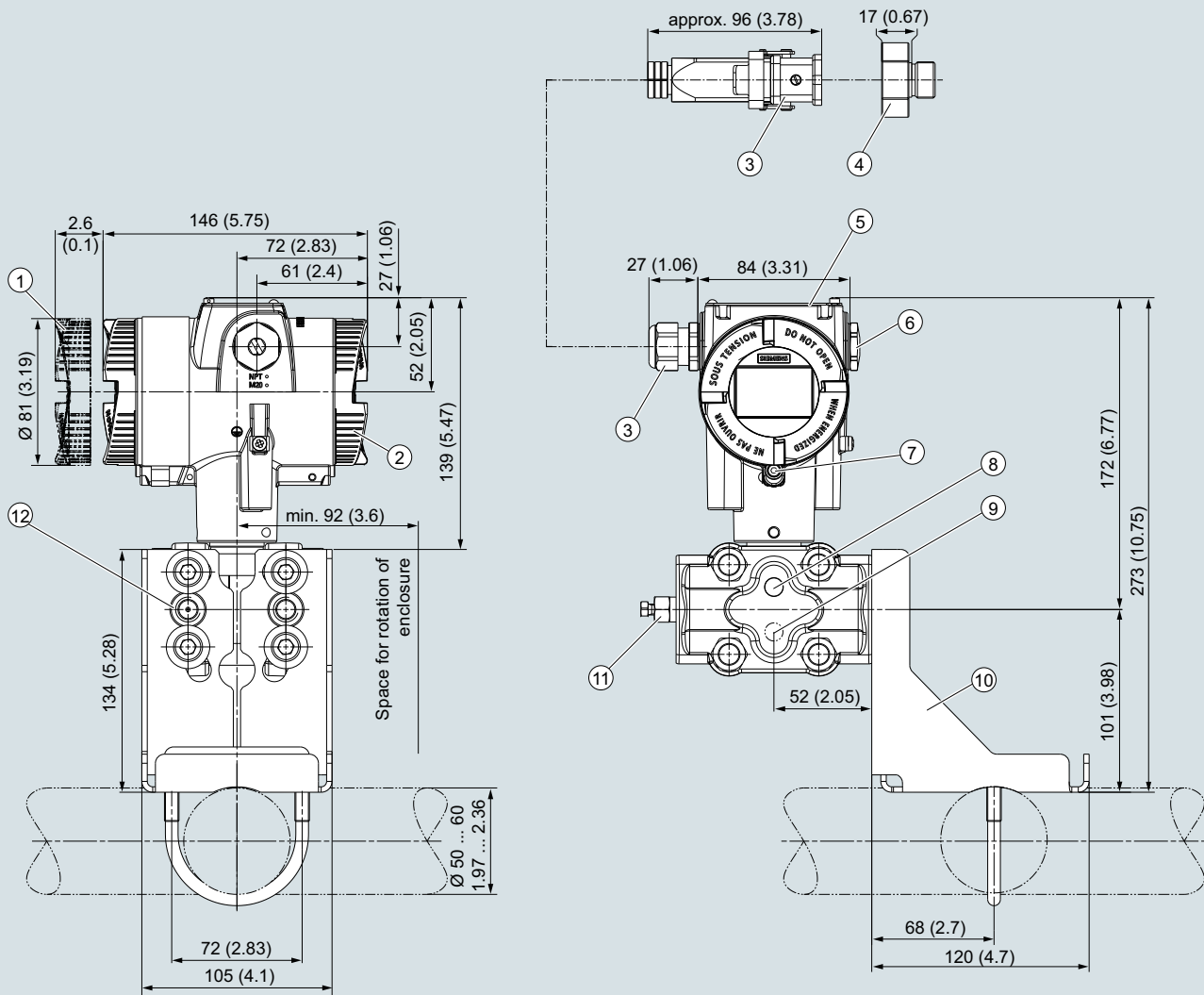
for applications with advanced requirements (Advanced)

SITRANS P320/420

for differential pressure and flow

1

Dimensional drawings



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

② Connection side

③ Electrical connection:
• M20 x 1,5³⁾ screw gland
• 1/2-14 NPT screw gland
• Han 7D/Han 8D^{2) 3)} device plug
• M12 device plug^{2) 3)}

④ Harting adapter

⑤ Cover over buttons and nameplate with general information

⑥ Blanking plug

⑦ Safety catch
(only for "flameproof enclosure" type of protection)

⑧ Lateral ventilation for liquid measurement (Standard)

⑨ Lateral ventilation for gas measurement (order option K85)

⑩ Mounting bracket (optional)

⑪ Sealing plug with valve (optional)

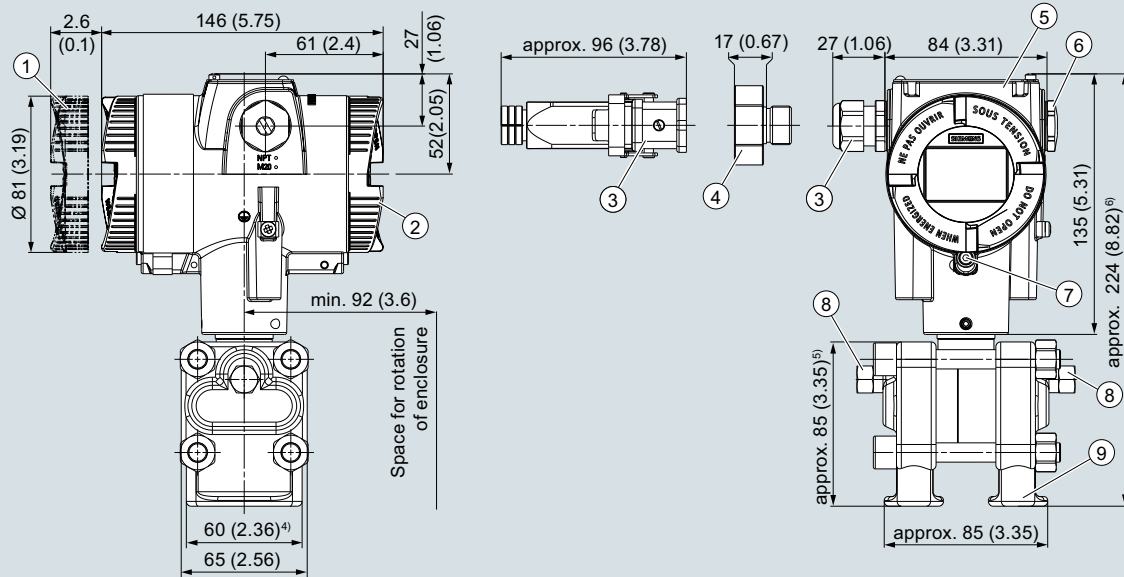
⑫ Process connection: 1/4-18 NPT (IEC 61518)

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

²⁾ Not with "flameproof enclosure" type of protection

³⁾ Not with type of protection "FM + CSA" [is + XP]"

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



- ① Electronics side, local display
(longer overall length for cover with inspection window)¹⁾
- ② Connection side
- ③ Electrical connection:
 - M20 x 1.5³⁾ screw gland
 - ½-14 NPT screw gland
 - Han 7D/Han 8D²⁾ 3) device plug
 - M12 device plug²⁾ 3)
- ④ Harting adapter

- ⑤ Cover over buttons and nameplate
with general information
- ⑥ Blanking plug
- ⑦ Safety catch
(only for "flameproof enclosure" type of protection)
- ⑧ Sealing plug with valve (option)
- ⑨ Process connection: ¼-18 NPT (IEC 61518)

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

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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for level

Technical specifications

SITRANS P320 / SITRANS P420 for level

Input

Measured variable

Level

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

Measuring span

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

25 ... 250 mbar
2.5 ... 25 kPa
10 ... 100.5 inH₂O

See "Mounting flange"

25 ... 600 mbar
2.5 ... 60 kPa
10 ... 241 inH₂O

53 ... 1600 mbar
5.3 ... 160 kPa
21 ... 643 inH₂O

166 ... 5 000 mbar
16.6 ... 500 kPa
2.41 ... 72.5 psi

Measuring limits

- Lower measuring limit
 - Measuring cell with silicone oil filling
 - Measuring cell with inert oil
 - Measuring cell with FDA-compliant oil
- Upper measuring limit
- Lower range value

-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange
-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange
-100% of max. measuring range or 100 mbar a/10 kPa a/1.45 psi a
100% of max. measuring span
Between the measuring limits (infinitely adjustable)

Output

HART

Output signal

4 ... 20 mA

- Lower saturation limit (infinitely adjustable)
- Upper saturation limit (infinitely adjustable)
- Ripple (without HART communication)

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

Adjustable damping

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

- Current transmitter
- Failure signal

3.55 ... 22.8 mA
3.55 ... 22.8 mA

Load

Resistance R [Ω]

- Without HART communication

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

Characteristic curve

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

Physical bus

-

Polarity-independent

-

Measuring accuracy

Reference conditions

- According to IEC 62828-1
- Rising characteristic curve
- Lower range value 0 bar/kPa/psi
- Seal diaphragm stainless steel
- Measuring cell with silicone oil filling
- Room temperature 25 °C (77 °F)

SITRANS P320 / SITRANS P420 for level

Conformity error at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, Turn-Down)

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

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

- SITRANS P320
 - 250 mbar/25 kPa/3.6 psi
 - 600 mbar/60 kPa/8.7 psi
 - 1600 mbar/160 kPa/23.21 psi
 - 5 bar/500 kPa/72.5 psi
- SITRANS P420
 - 250 mbar/25 kPa/3.6 psi
 - 5 bar/500 kPa/72.5 psi
 - 600 mbar/60 kPa/8.7 psi
 - 1600 mbar/160 kPa/23.21 psi

Effect of static pressure

- At the lower range value
 - 250 mbar/25 kPa/3.63 psi
 - 600 mbar/60 kPa/8.7 psi
 - 1.6 bar/160 kPa/23.21 psi
 - 5 bar/500 kPa/72.52 psi
- on the measuring span

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

- all measuring cells

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

Influence of mounting position

Effect of auxiliary power (in % per voltage change)

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

$$\begin{aligned} r \leq 5: & \leq 0.125\% \\ 5 < r \leq 10: & \leq (0.007 \cdot r + 0.09)\% \end{aligned}$$

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

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

$$\leq (0.125 \cdot r + 0.0625)\%$$

$$\begin{aligned} & \leq (0.3 \cdot r) \% \text{ per nominal pressure} \\ & \leq (0.15 \cdot r) \% \text{ per nominal pressure} \end{aligned}$$

$$\leq (0.1 \cdot r) \% \text{ per nominal pressure}$$

In 5 years $\leq (0.25 \cdot r) \%$ static pressure max. 70 bar/7 MPa/1015 psi

Depending on the installed remote seal

Depends on the filling liquid in the mounting flange

0.005% per 1 V

Operating conditions

Medium temperature

Measuring cell with silicone oil filling

- High side: See "Mounting flange"
- Low 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
 - Continuous shocks (half-sine) IEC 60068-2-27
 - Noise (digitally controlled) IEC 60068-2-64
- Operating conditions for marine applications
 - IEC 60068-2-6
 - DNVGL-CG-0339, clause 6
 - Lloyd's Register Test Specification Number 1, section 12
 - Bureau Veritas Pt C, Ch 3, Sec 6, Table 1, No 7

Specifications apply to devices without mounting bracket

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

58 ... 500 Hz, 20 m/s² (65.62 ft/s²)

1 octave/min

5 cycles/axis

250 m/s² (820 ft/s²)

6 ms

2000 shocks/axis

10 ... 200 Hz; 1 (m/s²)/Hz (3.28 (ft/s²)/Hz)

200 ... 500 Hz; 0.3 (m/s²)/Hz (0.98 (ft/s²)/Hz)

4 hours/axle

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

25 ... 100 Hz, 40 m/s² (131.23 ft/s²)

1 octave/min

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for level

SITRANS P320 / SITRANS P420 for level

Structural design

Weight

- According to EN
- According to ASME

Material

- Wetted parts materials
 - High side

- Gasket material in the process flanges

- Low side

- Non-wetted parts materials
 - Electronics enclosure

Process flange screws

Measuring cell filling

- Mounting flange filling liquid

Process connection

- High side
- Low side

Electrical connection

Pressure transmitter with mounting flange, without tube

- Aluminum enclosure: approx. 11 ... 13 kg (24.2 ... 28.7 lb)
- Stainless steel enclosure: approx. 13 ... 15 kg (28.7 ... 33 lb)
- Aluminum enclosure: approx. 11 ... 18 kg (24.2 ... 39.7 lb)
- Stainless steel enclosure: approx. 13 ... 20 kg (28.7 ... 44 lb)

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

For standard applications

Viton

For negative pressure applications on the mounting flange

Copper

Seal diaphragm

Stainless steel, mat. no. 1.4404/316L

Process flanges

Stainless steel, mat. no. 1.4408/316

Process flange screw

Stainless steel ISO 3506-1 A4-70

O-ring

FPM (Viton)

- 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 nameplate (1.4404/316L)

Stainless steel ISO 3506-1 A4-70

Silicone oil

Silicone oil or other material

Flange according to EN and ASME

1/4-18 NPT female thread and flange connection with M10 fastening screw thread according to DIN 19213 (M12 for PN 420 (MWP 6092 psi)) or 7/16-20 UNF according to EN 61518

Screw terminals

Cable entry via the following screwed glands:

- M20 x 1.5
- 1/2-14 NPT
- Device plug Han 7D/Han 8D¹⁾
- Device plug M12

Displays and controls

Buttons

4 buttons for operation directly on the device

Display

- With or without integrated display (optional)
- Lid 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 mod

Ripple

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

Noise

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

Auxiliary power

–

Separate supply voltage

–

SITRANS P320 / SITRANS P420 for level**Certificates and approvals**

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

Drinking water

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

CRN (Canada)

Explosion protection acc. to NEPSI (China)

Explosion protection acc. to INMETRO (Brazil)

Explosion protection

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

Explosion protection acc. to FM

- Marking (XP/DIP) or IS; NI; S

Explosion protection according to CSA

- Marking (XP/DIP) or (IS)

NAMUR recommendations

- NE 06
- NE 21
- NE 23
- NE 43
- NE 53
- NE 80
- NE 105
- NE 107
- NE 131

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

No.: 1903094 (option E83)

No.: 18 ACC LY 277 (option E85)

No.: 20180920-MH61350 (option E84)

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

No.: GYJ19.1058X (option E27)

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

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

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

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

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

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

To certified intrinsically safe circuits with peak values:

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

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

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

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

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

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

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

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

To circuit with the operating values

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

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 circuit with the operating values

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

Ex II 2D Ex ib IIIC T120 °C Db

-40 ... +80 °C (-40 ... +176 °F)

-40 ... +100 °C (-40 ... +212 °F)

To certified intrinsically safe circuits with peak values:

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

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

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

Ex II 3G Ex ec IIC T4/T6 Gc

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

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

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

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

To a circuit with the operating values:

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

Available soon

CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2,

GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

Available soon

CL I, DIV 1, GP ABCD T4 ... T6; CL II, DIV 1, GP EFG; CL III; Ex ia IIC T4 ... T6: CL I, DIV 2,

GP ABCD T4 ... T6; CL II, DIV 2, GP FG; CL III

Standardized Electrical Signals and Questions Relating to Engineering Technology

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

Extra Low Voltage Circuits with Safe Separation

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

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

The Application of the Pressure Equipment Directive to Process Control Devices

Specifications for Integrating Fieldbus Devices in Engineering Tools for Field Devices

Self-Monitoring and Diagnosis of Field Devices

NAMUR Standard Device - Field Devices for Standard Applications

¹⁾ Han 8D is identical to Han 8U.

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for level

1

Mounting flange

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

Communication

HART		FOUNDATION Fieldbus	
HART	230 ... 1 100 Ω	Device profile	FF ITK 6
Protocol	HART 7	Function blocks	3 function blocks analog input, 1 function block PID
Software for computer	SIMATIC PDM	• Analog input - Adaptation to user-specific process variable - Electrical damping adjustable - Simulation function - Response to failure - Limit monitoring - Square-rooted characteristic curve for flow measurement	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input (can be locked within the device with a bridge) Parameterizable (last good value, substitute value, incorrect value) Yes, one upper and lower warning limit and one alarm limit respectively Yes
PROFIBUS PA		• PID • Physical block	Standard FOUNDATION Fieldbus function block 1 resource block
Simultaneous communication with master class 2 (max.)	4	Transducer blocks	1 transducer block Pressure with calibration, 1 transducer block LCD
The address can be set using	Configuration tool or local operation (standard setting address 126)	• Pressure transducer block - Can be calibrated by applying two pressures - Monitoring of sensor limits - Simulation function: pressure measurement, sensor temperature and electronics temperature	Yes Yes Constant value or by means of parameterizable ramp function
Cyclic data usage	≤ 35 (7 measured values)		
• Output byte • Input byte	0, 1, or 2 (register operating mode and reset function for dosing)		
Internal preprocessing			
Device profile	PROFIBUS PA Profile Version 4.01 Class B. Cyclic data usage compatible with version 3.XX		
Number of function blocks	7		
• Analog input - Adaptation to user-specific process variable - Electrical damping adjustable - Simulation function - Limit monitoring	Yes, linearly rising or falling characteristic curve 0 ... 100 s Output/input Yes, one upper and lower warning limit and one alarm limit respectively		
• Register (totalizer)	Can be reset, preset, optional direction of counting, simulation function of register output		
- Limit monitoring	One upper and lower warning limit and one alarm limit respectively		
• Physical block	1		
Transducer blocks	1		
• Pressure transducer block - Can be calibrated by applying two pressures - Monitoring of sensor limits - Specification of a vessel characteristic with - Square-rooted characteristic curve for flow measurement - Tank characteristic curve for volume measurement - Low flow cut-off and implementation point of square-root extraction - Simulation function for measured pressure value and sensor temperature	Yes Yes Max. 30 nodes Yes Yes Parameterizable Constant value or by means of parameterizable ramp function		

Selection and ordering data

Article No.

Pressure transmitters for level

SITRANS P320

7MF036 - - - - -

SITRANS P420

7MF046 - - - - -

[Click on the Article No. for the online configuration in the PIA Life Cycle Portal.](#)

Communication

HART, 4 ... 20 mA

PROFIBUS PA

FOUNDATION Fieldbus (FF)

Measuring cell filling

Silicone oil

Maximum measuring span

250 mbar (100.5 inH₂O)600 mbar (241 inH₂O)1 600 mbar (643 inH₂O)

5 000 mbar (72.5 psi)

Process connection

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

Wetted parts materials: Process connection, seal diaphragm

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

Non-wetted parts materials

Die-cast aluminum

Stainless steel precision casting CF3M/1.4409 similar to 316L

Enclosure

Dual chamber device

Type of protection

Without Ex

Intrinsic safety

Flameproof enclosure

Flameproof enclosure, intrinsic safety

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

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

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

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

Electrical connections/cable entries

Thread for cable gland: Cable gland must be ordered separately as option (Axx)

• 2 x M20 x 1.5

• 2 x 1/2-14 NPT

Local operation/display

Without display (lid closed)

With display (lid closed)

With display (lid with glass pane)

0

1

2

1

G

H

M

P

V

0

1

2

5

A

B

C

D

L

M

S

T

F

M

0

1

2

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for level

1

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	A00
Metal	A01
Stainless steel	A02
Stainless steel 316L/1.4404	A03
CMP, for XP devices	A10
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	A30
Device plug Han 7D (plastic, angled)	A31
Device plug Han 7D (metal, straight)	A32
Device plug Han 7D (metal, angled)	A33
Device plug Han 8D (plastic, straight)	A34
Device plug Han 8D (plastic, angled)	A35
Device plug Han 8D (metal, straight)	A36
Device plug Han 8D (metal, angled)	A37
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	A40
Metal, for device plug Han 7D and Han 8D	A41
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	A90
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	A91
Cable gland/device plug mounted left	A97
Cable gland/device plug mounted right	A99
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13
Italian (bar)	B14
Chinese (bar)	B15
Russian (bar)	B16
English (psi)	B20
English (Pa)	B30
Chinese (Pa)	B35
Certificates	
Quality inspection certificate, 5-point factory calibration (IEC 62828-2)	C11
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	C12
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	C13
Factory certificate (EN 10204-2.2) - Wetted parts	C14
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	C15
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Device options	
PDF file with device settings	D10
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	D30
Unlabeled TAG plate	D40
Without labeling of the measuring range on the TAG plate	D41
Stainless steel Ex plate 1.4404/316L	D42
Overvoltage protection up to 6 kV (internal)	D70
Overvoltage protection up to 6 kV (external)	D71
Labels on transport packaging (provided by customer)	D90
General approval without Ex approval	
Worldwide (CE, RCM) except EAC, FM, CSA, KCC	E00
Worldwide (CE, RCM, EAC, FM, CSA, KCC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KCC	E09
Explosion protection approvals	
ATEX (Europe)	E20
CSA (USA and Canada) ¹⁾	E21
FM (USA and Canada) ¹⁾	E22
IECEx (Worldwide)	E23
EACEx (GOST-R, -K, -B)	E24
INMETRO (Brazil)	E25
KCs (Korea)	E26
NEPSI (China)	E27
PESO (India)	E28
UKR Sepro (Ukraine)	E30
ATEX (Europe) and IECEx (Worldwide)	E47
CSA (Canada) and FM (USA) ¹⁾	E48
ATEX (Europe) and IECEx (Worldwide) + CSA (Canada) and FM (USA) ¹⁾	E49
Marine approvals	
DNV-GL (Det Norske Veritas/Germanischer Lloyd)	E50
LR (Lloyds Register)	E51
BV (Bureau Veritas)	E52
ABS (American Bureau of Shipping)	E53
RMR (Russian Maritime Register)	E55
KR (Korean Register of Shipping)	E56
RINA (Registro Italiano Navale)	E57
CCS (China Classification Society)	E58
Country-specific approvals	
CRN approval Canada (Canadian Registration Number)	E60

Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Special approvals	
Oxygen application (with inert liquid, max. 100 bar (1 450 psi) at 60° C (140 °F))	E80
Dual Seal	E81
WRC/WRAS (drinking water); only with process flange O-rings made of EPDM	E83
NSF61 (drinking water)	E84
ACS (drinking water)	E85
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm ² , kg/cm ² , kgf/cm ² , inH ₂ O, inH ₂ O (4°C), ftH ₂ O, mmH ₂ O, mmH ₂ O (4°C), mH ₂ O (4°C), mmHg, inHg, atm, torr	Y01
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	Y16
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	Y17
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	Y21
Local display Scaling with standard units [m ³ /s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m ³ , l, hl, in ³ , ft ³ , yd ³ , gal, gal (UK), bu, bbl, bbl (US), SCF, Nm ³ , NI.	Y22
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	Y32
ID number of special design Input field: max. 4 characters and only natural numbers from 0 ... 9999	Y99

¹⁾ Explosion protection acc. to FM/CSA: suitable for installation according to NEC 500/505.

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/P420

for level

1

		Article No.	Order-code			Article No.	Order-code
Diaphragm seal		7MF0814 -		Diaphragm seal		7MF0814 -	
In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit		03 - 0		In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit		03 - 0	
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.				Filling liquid			
Standard of process connection EN 1092-1				Silicone oil M50		B	
Nominal diameter	Nominal pressure			High-temperature oil		C	
DN 40	PN 10/16/25/40	0DD		Silicone oil M5		A	
	PN 63/100	0DF		Food oil (FDA-listed)		E	
	PN 160	0DG		Halocarbon oil		D	
DN 50	PN 10/16/25/40	0ED		Other version		Z	P1Y
	PN 63/100	0EE		Add order code and plain text.			
	PN 160	0EF		Wetted parts materials			
DN 80	PN 10/16/25/40	0GD		316L stainless steel			
	PN 100	0GF		• Without coating		A	
DN 100	PN 10/16	0HB		• With PFA coating		D	
	PN 25/40	0HD		• With PTFE coating		E0	
DN 125	PN 16	0JB		• With ECTFE coating		F	
	PN 40	0JD		Monel 400, 2.4360		G	
Standard of process connection ASME B16.5				Hastelloy C276, 2.4819		J	
Nominal diameter	Nominal pressure			Tantalum		K	
1½ inch	Class 150	1LA		Titanium, 3.7035		L0	
	Class 300	1LB		Nickel 201		M0	
	Class 400/600	1LD		Diaphragm Duplex, 1.4462		Q	
	Class 900/1500	1LF		Diaphragm and flange Duplex, 1.4462		R	
2 inch	Class 150	1MA		Stainless steel 316 with gold coating		S0	
	Class 300	1MB		Hastelloy C4, 2.4610		U0	
	Class 400/600	1MD		Hastelloy C22, 2.4602		V0	
	Class 900/1500	1MF		Other version		Z	Q1Y
3 inch	Class 150	1PA		Add order code and plain text.			
	Class 300	1PB		Tube length			
	Class 600	1PD		None		0	
	Class 1500	1PF		50 mm (2 inch)		1	
4 inch	Class 150	1QA		100 mm (4 inch)		2	
	Class 300	1QB		150 mm (6 inch)		3	
	Class 400	1QD		200 mm (8 inch)		4	
	Class 1500	1QF		250 mm (10 inch)		5	
5 inch	Class 150	1RA		Other version		Z8	R1Y
	Class 300	1RB		Add order code and plain text.			
	Class 400	1RC					
Process connection standard J.I.S.							
Nominal diameter	Nominal pressure						
DN 50	10K	2ES					
	20k	2ET					
	40K	2EU					
DN 80	10K	2GS					
	20k	2GT					
	40K	2GU					
DN 100	10K	2HS					
	20k	2HT					
	40K	2HU					
Other version		9ZA	H1Y				
Add order code and plain text.							

		Article No.	Order-code
Diaphragm seal		7MF0814 -	
In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit		03 - 0	
Customer-specific tube length			
• Wetted parts: Stainless steel without coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		A1
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		A2
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		A3
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		A4
201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)		A5
• Wetted parts: Stainless steel with ECTFE coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		F1
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		F2
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		F3
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		F4
201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)		F5
• Wetted parts: Stainless steel with PFA coating			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		D1
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		D2
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		D3
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		D4
201 ... 250 mm (7.91 ... 9.84 inch)	250 mm (9.84 inch)		D5
• Wetted parts: Monel 400			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		G1
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		G2
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		G3
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		G4
• Wetted parts: Hastelloy C276			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		J1
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		J2
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		J3
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		J4

		Article No.	Order-code
Diaphragm seal		7MF0814 -	
In flange design, directly installed on a pressure transmitter for level SITRANS P320/P420 7MF03../7MF04.. to be ordered separately, scope of delivery: 1 unit		03 - 0	
• Wetted parts: Tantalum			
Range	Standard length		
20 ... 50 mm (0.79 ... 1.97 inch)	50 mm (1.97 inch)		K1
51 ... 100 mm (2.01 ... 3.94 inch)	100 mm (3.94 inch)		K2
101 ... 150 mm (3.98 ... 5.91 inch)	150 mm (5.91 inch)		K3
151 ... 200 mm (5.94 ... 7.87 inch)	200 mm (7.87 inch)		K4

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

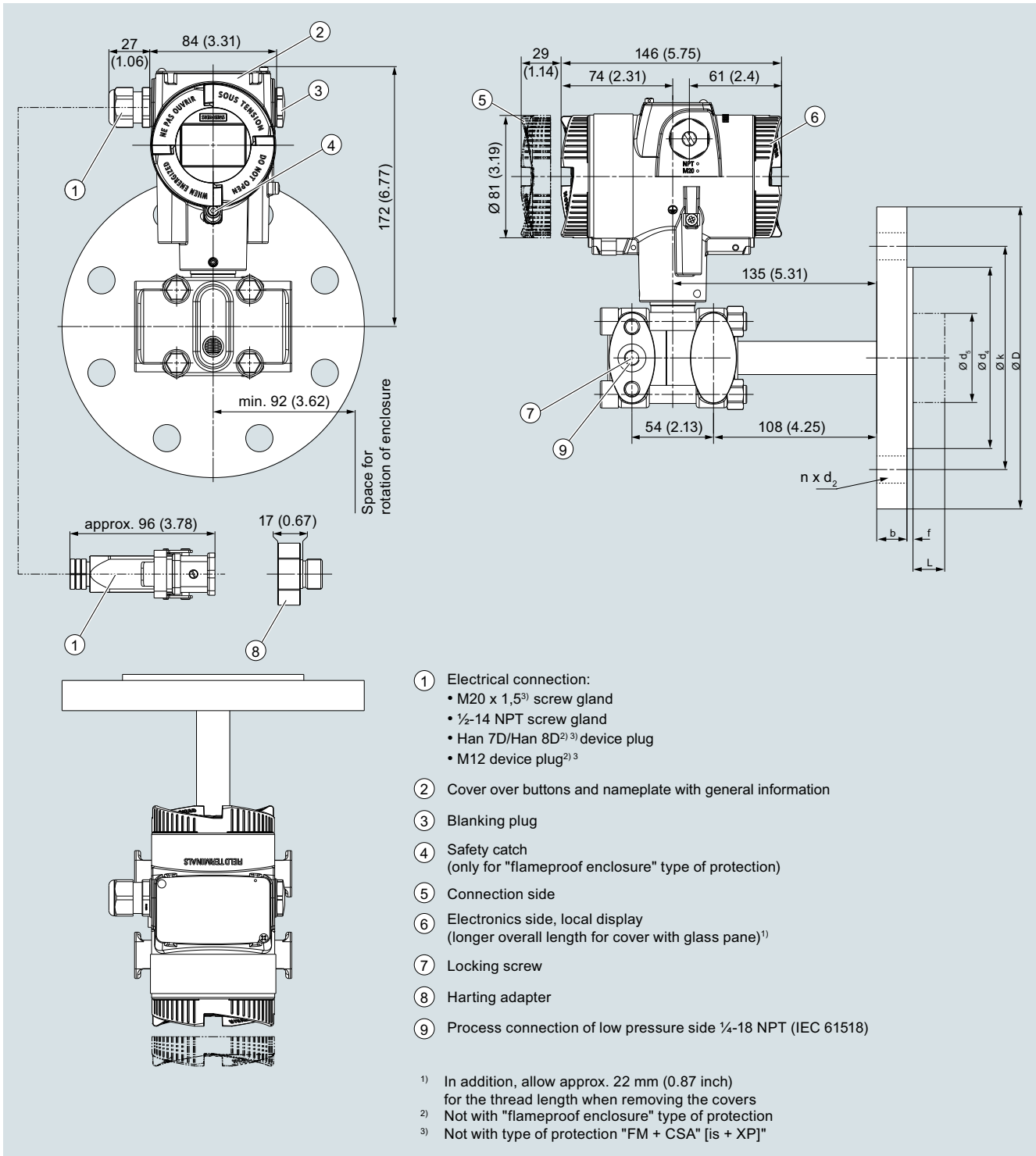
for level

1

Options	Order code	Options	Order code
Add "-Z" to article number, specify order code and plain text or entry from drop-down list.		Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	
Factory certificates		Sealing surface	
Quality inspection certificate (5-point factory calibration) acc. to IEC 62828-2	C11	Sealing surface smooth, Form B2/EN1092-1 or RFSF/ANSI 16.5 (only for wetted parts made of stainless steel 316L)	M50
Inspection certificate according to EN 10204-3.1 for main body and diaphragm	C12	Sealing surface groove according to EN 1092-1, Form D (instead of sealing surface B1, only for wetted parts made of stainless steel 316L)	M54
Manufacturer code according to NACE (MR 0103-2012 and MR 0175-2009) (only in combination with wetted parts made of stainless steel 316 L and Hastelloy)	C13	Sealing surface RJF (groove) according to ASME B16.5 (instead of sealing surface RF 125 ... 250AA, only for wetted parts made of stainless steel 316L)	M64
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	C15	Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)	
Test report on the FDA listing of the oil according to EN 10204-2.2	C17	• DN 40	M71
Factory certificate functional safety (SIL2/3), suitability of devices for use according to IEC 61508 and IEC 61511 (contains SIL declaration of conformity)	C20	• DN 50	M72
		• DN 80	M73
		• DN 100	M74
		• DN 125	M75
Accessories		Sealing surface male face according to EN 1092-1, Form C (only for wetted parts made of stainless steel 316L)	
Epoxy resin coating	D15	• DN 40	M77
Color: transparent, coverage: Front and rear of the remote seal, connecting pipe, process connection of the transmitter.		• DN 50	M78
• Not possible with negative pressure service		• DN 80	M79
Remote seal nameplate	D42	• DN 100	M80
Attached, made of stainless steel, contains Article No. and order number of the remote seal		• DN 125	M81
Volume deflagration flame arrester (VDEF) for differential pressure transmitter	D62	Sealing surface female face according to EN 1092-1, Form F (only for wetted parts made of stainless steel 316L)	
Negative pressure service		• DN 50	M84
Negative pressure service for differential pressure transmitters	D83	• DN 80	M85
Extended negative pressure service for differential pressure transmitters	D88	• DN 100	M86
		• DN 125	M87
Approvals and certificates		Remote seal connection	
Country-specific approval	E60	Elongated pipe, 150 mm (5.9 inch) instead of 100 mm (3.9 inch)	S05
CRN approval Canada (Canadian Registration Number)		Elongated pipe, 200 mm (7.9 inch) instead of 100 mm (3.9 inch)	S06
Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!		Desired remote seal supplier	
Oil-free and grease-free cleaned version for oxygen application including EN 10204-2.2 certificates (only with filling liquid halocarbon oil and at max. temperature 60 °C and max. pressure 50 bar)	E80	Note: If the remote seal is to be supplied only by one of the suppliers specified below, this option needs to be selected. For orders without this option, the remote seal supplier is selected through the dispatch center.	
Oil-free and grease-free cleaned version not for oxygen application, including EN 10204-2.2 certificates (only with filling liquid halocarbon oil)	E87	Company WIKA, Klingenberg	W01
		Company Labom, Hude	W02
		Special design	
		Welded filling hole	X01
		Customer-specific tube length	
		Customer-specific tube length (specify in plain text in mm)	Y44
		Specification of process conditions¹⁾	
		Ambient temperature range	
		• -10 ... +50 °C (14 ... +122 °F) preset	D66
		• -40 ... +50 °C (-40 ... +122 °F)	D67
		• -10 ... +85 °C (14 ... +185 °F)	D68
		Process temperature min. ... °C/(°F)/max. ... °C/(°F)	Y50

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

Dimensional drawings



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

Pressure Measurement

Pressure transmitters

for applications with advanced requirements (Advanced)

SITRANS P320/420

for level

Connection to EN 1092-1

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

Connection according to ASME B16.5

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

Process connection according to J.I.S

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

d: Internal diameter of seal according to DIN 2690

d_M: Effective diaphragm diameter