

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 pressure 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

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Technical reference

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)

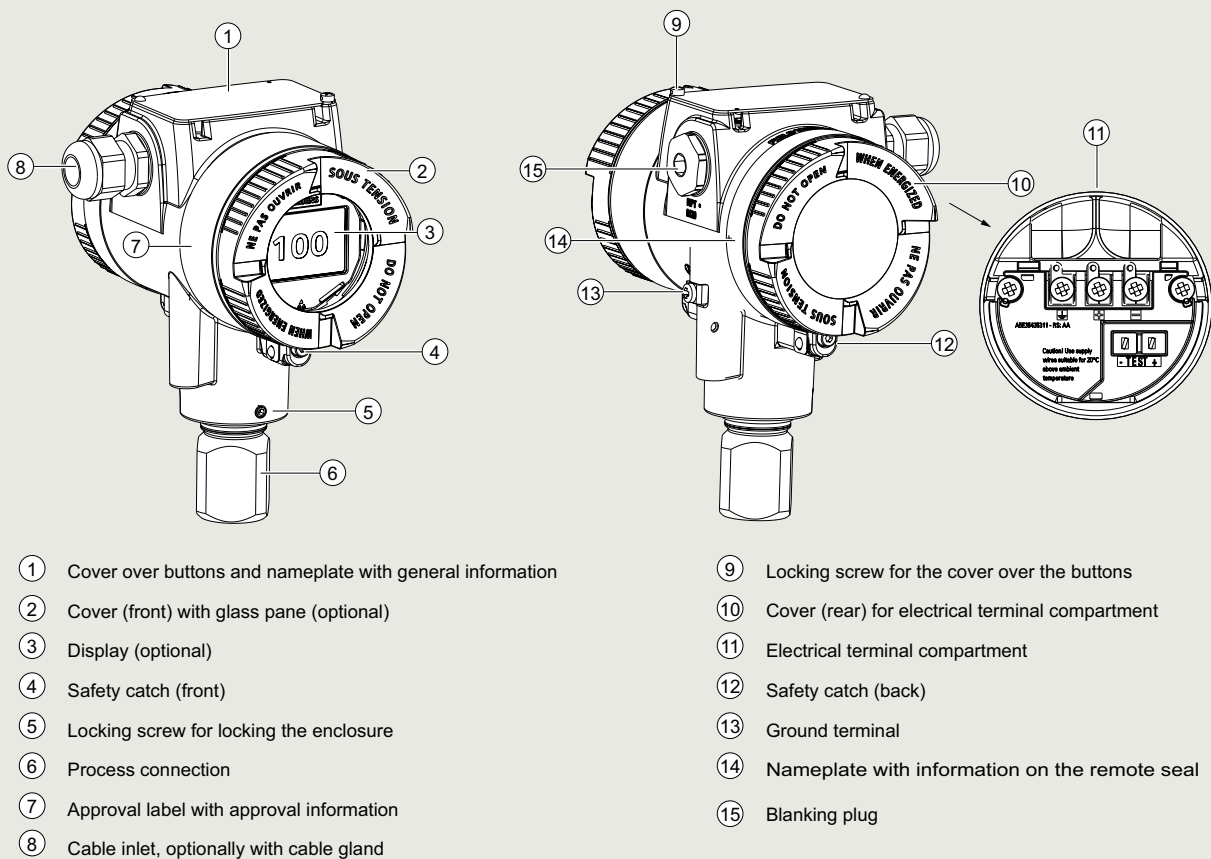
Type of the mounting flange:

Application (continued)

- 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 stainless steel investment casting.
- The enclosure has a removable cover at the front and the back.
- Depending on the device design, 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

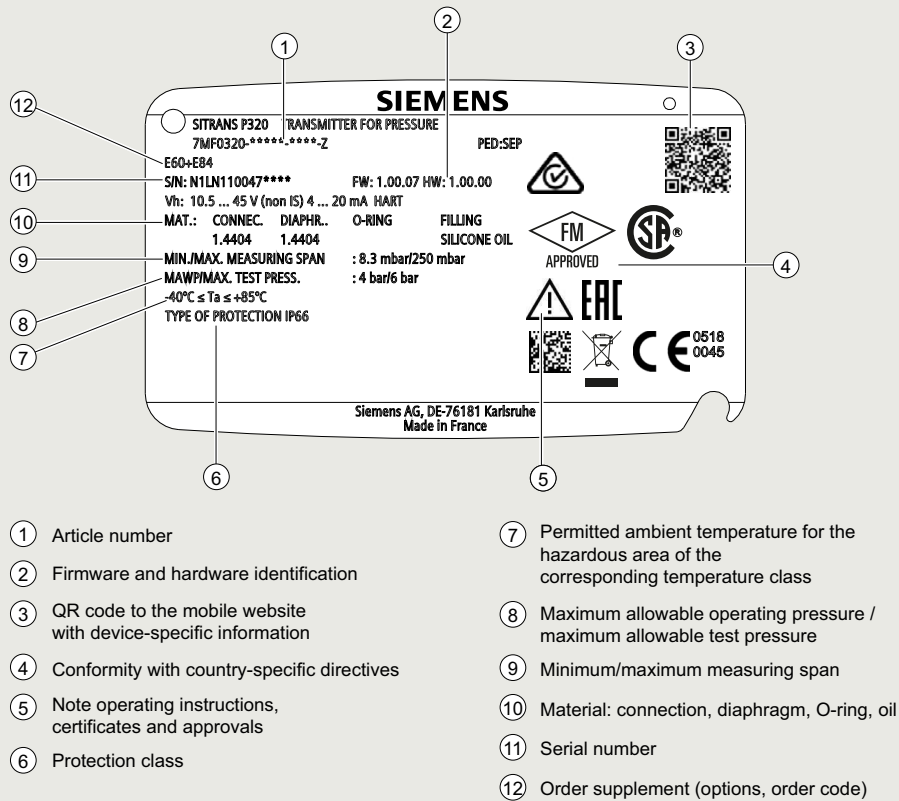
for applications with advanced requirements / SITRANS P320/P420 / Technical reference

Design (continued)

Nameplates

Nameplate

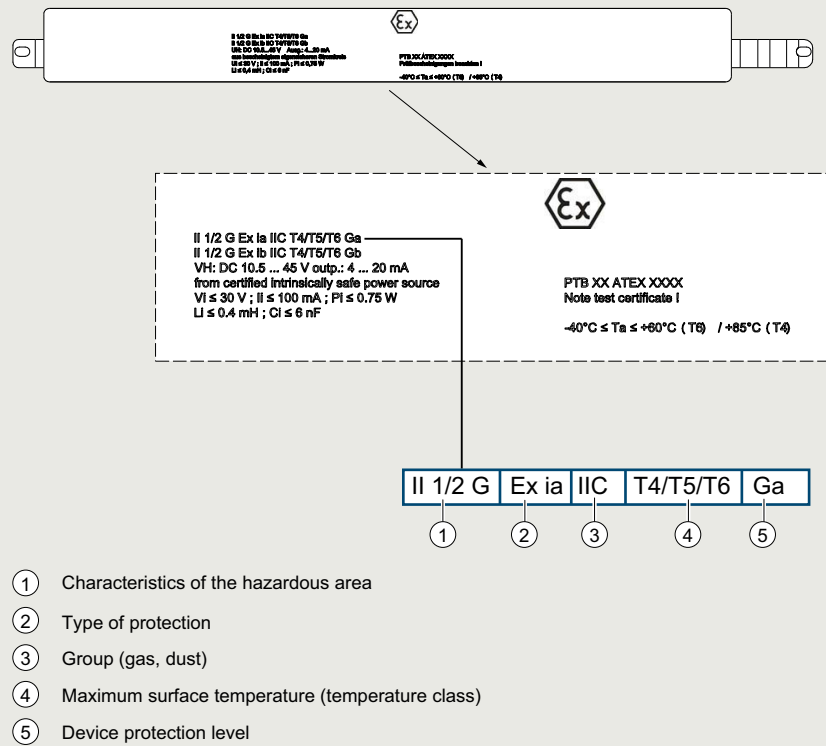
The nameplate with the article No. and other important information, such as design details and technical specifications, is located on the cover over the buttons.



Certification label with approval information

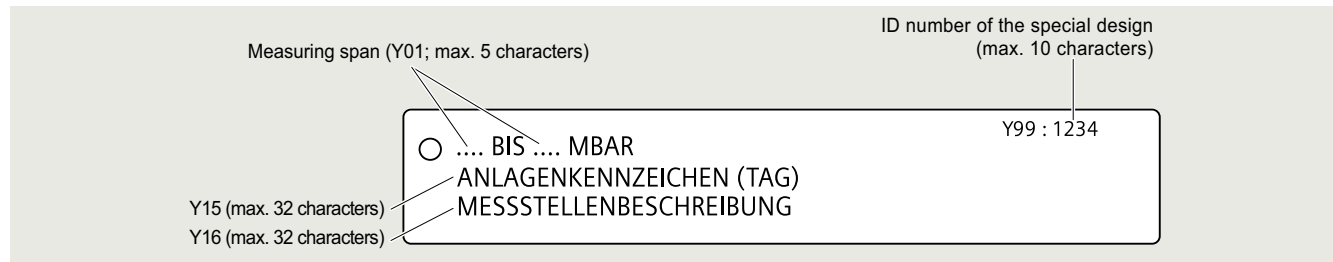
The certification label with approval information is located on the front of the enclosure.

Design (continued)



Tag plate

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



Nameplate with information on the remote seals

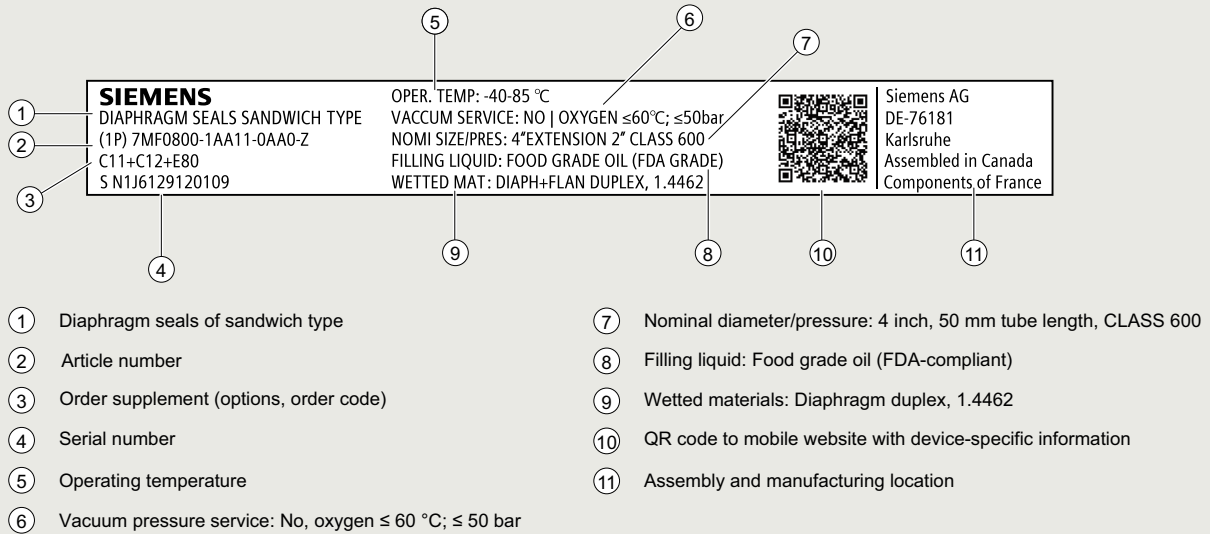
The nameplate with information on the remote seals is located on the back of the enclosure.

Pressure measurement

Pressure transmitters

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Design (continued)



Function

Adjustable parameters and diagnosticsSITRANS 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 (overrun/undershoot)	—	2	2
Maintenance and service timer	—	x	x
Trend log	—	—	2, max. 1 500 values
Diagnostic log	—	x	x
Parameters change log	—	—	x

Available physical units of display for SITRANS P320/P420

Physical variable	Physical 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.

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge pressure (pressure series)

Selection and ordering data

Pressure transmitters for gauge pressure (pressure series)										Article No.																					
SITRANS P320										7MF030										●	-	●	●	●	●	●	-	●	●	●	●
SITRANS P420										7MF040										●	-	●	●	●	●	●	-	●	●	●	●
Click the article number for online configuration in the PIA Life Cycle Portal.																															
Communication																															
HART, 4 ... 20 mA																								0							
PROFIBUS PA																								1							
FOUNDATION Fieldbus (FF)																								2							
Profibus over Ethernet-APL																								5							
Measuring cell filling																															
Silicone oil																								1							
Inert liquid																								3							
Neobee oil																								4							
Maximum measuring span																															
250 mbar (3.6 psi)																								F							
1 000 mbar (14.5 psi)																								J							
4 000 mbar (58 psi)																								N							
16 bar (232 psi)																								Q							
63 bar (914 psi)																								T							
160 bar (2 321 psi)																								V							
400 bar (5 802 psi)																								W							
700 bar (10 153 psi)																								X							
Process connection																															
External thread M20 × 1.5																									B						
External thread G½ (EN 837-1)																									D						
Internal thread ½-14 NPT																									E						
External thread ½-14 NPT																									F						
Oval flange, fastening thread: 7/16-20 UNF (IEC 61518)																									G						
Oval flange, fastening thread: M10 (DIN 19213)																									H						
Oval flange, fastening thread: M12 (DIN 19213)																									J						
Flush-mounted diaphragm (options M-R)																									K						
Version for diaphragm seal pressure																									U						
Material of wetted parts: 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						
Stainless steel 316L/1.4404, stainless steel 316L/1.4404 gold-plated																									7						
Material of non-wetted parts																															
Die-cast aluminum																									1						
Stainless steel investment 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				
Intrinsic safety, 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 L (Zone model, Class Division)																												T			
Electrical connections/cable entries																															
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																															
• 2 × M20 × 1.5																												F			
• 2 × ½-14 NPT																												M			

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge pressure (pressure series)

Selection and ordering data (continued)

Pressure transmitters for gauge pressure (pressure series)										Article No.
SITRANS P320										7MF030
SITRANS P420										7MF040
Local operation/display										
Without local display (lid closed)										0
With local display (lid closed)										1
With local display (lid with glass pane)										2

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
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
Sealing plug included, plastic	A20
Sealing plug included, metal	A21
Sealing plug included, stainless steel	A22
Sealing plug included, stainless steel 316L/1.4404	A23
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	A30
Device plug Han 7D, mounted left (plastic, angled)	A31
Device plug Han 7D, mounted left (metal, straight)	A32
Device plug Han 7D, mounted left (metal, angled)	A33
Device plug Han 8D, mounted left (plastic, straight)	A34
Device plug Han 8D, mounted left (plastic, angled)	A35
Device plug Han 8D, mounted left (metal, straight)	A36
Device plug Han 8D, mounted left (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/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	A45
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	A48
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	A49
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	A90
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	A91
Cable gland mounted left	A97
Plug mounted right	A98
Cable gland mounted right	A99

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
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
Russian (Pa)	B36
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
Declaration of compliance with the order EN 10204-2.1: Compliance with order	C35
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66/IP68 (not for device plug 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
Transmitter packaged in foil	D60
Cleaning the measuring cell, grease-free as per cleanliness level 2, DIN 25410; transmitter packaged in foil	D61
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packed in foil; (particles < 50 mg/m²; oil and residual grease content HC < 100 mg/m²)	D62
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, UKCA, RCM) except EAC, FM, CSA, KC	E00
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	E01
CSA (USA and Canada)	E06
EAC	E07

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge pressure (pressure series)

Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
FM	E08
KC	E09
Explosion protection approvals	
ATEX (Europe)	E20
CSA (USA and Canada) ¹⁾	E21
FM (USA) ¹⁾	E22
IECEX (Worldwide)	E23
EACEx (GOST-R, -K, -B)	E24
INMETRO (Brazil)	E25
KCs (Korea)	E26
NEPSI (China)	E27
PESO (India)	E28
CSA (Japan)	E29
ECASEX (UAE)	E32
UKEX (United Kingdom)	E33
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	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. 160 bar (2 320 psi) at 100 °C (212 °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
EHEDG (hygiene)	E87
Special designs of devices	
Custom design F02	F02
Custom design F04	F04
Custom design F12	F12
Custom design F14	F14
Mounting bracket	
Zinc-plated steel	H01
Stainless steel 1.4301/304	H02
Stainless steel 1.4404/316L	H03
Mounting bracket, zinc-plated steel, reinforced (KTA)	H05
Flange connections with flange EN 1092-1	
P 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

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
• DN 80 PN 40, stainless steel 1.4571/316Ti	J82
P with water trap 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
Flange connection options	
DP/P flange connection with epoxy resin coating (can only be ordered together with Y99: 0565).	J77
Process flanges, process connection option	
Process connection (oval flange) NAM (ASTAVA) (MAWP 420 bar)	K21
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
Gasket (EN 837-1) material Fe (soft iron)	K60
Gasket (EN 837-1) material 1.4571	K61
Gasket (EN 837-1) material Cu	K62
Process flange options	
Process connection external thread G½, bore hole 11 mm	K80
Oval flange included, PTFE gasket + fixing screws	K86
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 internal 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 sealing ring, steel fixing 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 sealing ring, stainless steel fixing screws, pressure test certified in factory certificate (EN 10204-2.2)	T06
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	Y01
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
TAG short (device parameters, max. 8 characters)	Y17
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	Y21
Local display: Scaling with standard units [m³/s, l/s, m, inch, ...], example 1 ... 5 m]	Y22
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	Y32
ID number of special design	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 / SITRANS P320/P420 / Gauge pressure (pressure series)

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 0.83 ... 25 kPa 0.12 ... 3.6 psi	4 bar 0.4 MPa 58 psi	6 bar 0.6 MPa 87 psi
	0.01 ... 1 bar 1 ... 100 kPa 0.15 ... 14.5 psi	6 bar 0.6 MPa 87 psi	9 bar 0.9 MPa 130 psi
	0.04 ... 4 bar 4 ... 400 kPa 0.58 ... 58 psi	20 bar 2 MPa 290 psi	30 bar 3 MPa 435 psi
	0.16 ... 16 bar 0.016 ... 1.6 MPa 2.3 ... 232 psi	45 bar 4.5 MPa 652 psi	70 bar 7 MPa 1015 psi
	0.63 ... 63 bar 0.063 ... 6.3 MPa 9.1 ... 914 psi	80 bar 8 MPa 1160 psi	120 bar 12 MPa 1740 psi
	1.6 ... 160 bar 0.16 ... 16 MPa 23 ... 2321 psi	240 bar 24 MPa 3481 psi	360 bar 36 MPa 5221 psi
	4 ... 400 bar 0.4 ... 40 MPa 58 ... 5802 psi	400 bar 40 MPa 5802 psi	600 bar 60 MPa 8702 psi
	7 ... 700 bar 0.7 ... 70 MPa 102 ... 10153 psi	800 bar 80 MPa 11603 psi	800 bar 80 MPa 11603 psi
Measuring limits			
• Lower measuring limit	For 250 mbar/25 kPa/3.6 psi measuring cells, the lower measuring limit is 750 mbar a/75 kPa a/10.8 psi a. The measuring cell is vacuum-resistant up to 30 mbar a/3 kPa a/0.44 psi a.		
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert fill oil	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with FDA compliant fill oil	100 mbar a/10 kPa a/1.45 psi a		
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/medium temperature)		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output	HART		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory set 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, infinitely adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over local display		
Current simulator	3.55 ... 22.8 mA		
Failure signal	3.55 ... 22.8 mA (factory set to 3.55 mA)		
Load	Resistance R [Ω]		
• Without HART communication	$R_{max} = (U_H - 10.5 \text{ V}) / 22.8 \text{ mA}$, U_H : Auxiliary power in V		
• With HART communication	R = 230 ... 1100 Ω		
Characteristic curve	• Linearly increasing or linearly decreasing		
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)		
Characteristic curve deviation at limit point setting, including hysteresis and repeatability			
Measuring span ratio r (spread, turn-down)	r = max. measuring span/set measuring span and nominal measuring range		
Linear characteristic curve			

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge pressure (pressure series)

Technical specifications (continued)

SITRANS P320/SITRANS P420 for gauge pressure (pressure series)		
• 250 mbar/25 kPa/3.6 psi	$r \leq 1.25$:	$\leq 0.065\%$ (SITRANS P320) $\leq 0.04\%$ (SITRANS P420)
• 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	$1.25 < r \leq 30$: $r \leq 5$: $5 < r \leq 100$:	$\leq (0.008 \cdot r + 0.055)\%$ $\leq 0.055\%$ (SITRANS P320) $\leq 0.04\%$ (SITRANS P420) $\leq (0.004 \cdot r + 0.045)\%$
• 400 bar/40 MPa/5802 psi • 700 bar/70 MPa/10152 psi	$r \leq 5$: $5 < r \leq 100$: $r \leq 5$: $5 < r \leq 100$:	$\leq 0.055\%$ (SITRANS P320) $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P320) $\leq 0.04\%$ (SITRANS P420) $\leq (0.004 \cdot r + 0.045)\%$ (SITRANS P420)
<u>Effect of ambient temperature</u> (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	$\leq (0.16 \cdot r + 0.1)\%$ $\leq (0.05 \cdot r + 0.1)\%$ $\leq (0.025 \cdot r + 0.125)\%$ $\leq (0.08 \cdot r + 0.16)\%$	
<u>Long-term stability at ± 30 °C (± 54 °F)</u>		
• 250 mbar/25 kPa/3.6 psi	$\leq (0.25 \cdot r)\%$ per year In 5 years $\leq (0.35 \cdot r)\%$ In 10 years $\leq (0.45 \cdot r)\%$ In 15 years $\leq (0.50 \cdot r)\%$	
• 1 bar/100 kPa/14.5 psi	In 5 years $\leq (0.15 \cdot r)\%$ In 10 years $\leq (0.25 \cdot r)\%$ In 15 years $\leq (0.35 \cdot r)\%$	
• 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	In 5 years $\leq (0.05 \cdot r)\%$ In 10 years $\leq (0.1 \cdot r)\%$ In 15 years $\leq (0.15 \cdot r)\%$	
• 700 bar/70 MPa/10152 psi	In 5 years $\leq (0.05 \cdot r)\%$ In 10 years $\leq (0.1 \cdot r)\%$ In 15 years $\leq (0.15 \cdot r)\%$	
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 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	-40 ... +100 °C (-40 ... +212 °F)	
• Measuring cell with inert fill oil		
- 1 bar/100 kPa/14.5 psi - 4 bar/400 kPa/58 psi - 16 bar/1.6 MPa/232 psi - 63 bar/6.3 MPa/914 psi	-40 ... +100 °C (-40 ... +212 °F)	
- 160 bar/16 MPa/2321 psi - 400 bar/40 MPa/5802 psi - 700 bar/70 MPa/10152 psi	-20 ... +100 °C (-4 ... +212 °F)	
• Measuring cell with FDA compliant fill oil	-10 ... +100 °C (14 ... +212 °F)	
Ambient conditions		
Ambient temperature/enclosure		
• Measuring cell with silicone oil filling	Observe the temperature class in hazardous areas. -40 ... +85 °C (-40 ... +185 °F)	
• Measuring cell with inert fill oil		
- 1 bar/100 kPa/14.5 psi - 4 bar/400 kPa/58 psi - 16 bar/1.6 MPa/232 psi - 63 bar/6.3 MPa/914 psi - 160 bar/16 MPa/2321 psi - 400 bar/40 MPa/5802 psi - 700 bar/70 MPa/10152 psi	-40 ... +85 °C (-40 ... +185 °F)	
- Measuring cell with FDA compliant fill oil	-10 ... +85 °C (14 ... +185 °F)	

Technical specifications (continued)

SITRANS P320/SITRANS P420 for gauge pressure (pressure series)	
- Local 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	-20 ... +80 °C (-4 ... +176 °F) -50 ... +85 °C (-58 ... +185 °F) (with FDA compliant fill oil: -20 ... +85 °C (-4 ... +185 °F)) 4K4H IP66, IP68 Type 4X According to IEC 61326 and NAMUR NE 21
Structural design Weight Material • Material of wetted parts - Process connection - Oval flange - Seal diaphragm • Material of non-wetted parts - Electronics enclosure - Mounting bracket Process connection Electrical connection	• Aluminum enclosure: Approx. 1.8 kg (3.9 lb) • Stainless steel enclosure: Approx. 3.8 kg (8.3 lb) Stainless steel, mat. no. 1.4404/316L or Alloy C22, mat. no. 2.4602 Stainless steel, mat. no. 1.4404/316L Stainless steel, mat. no. 1.4404/316L or alloy C276, mat. no. 2.4819, or stainless steel, mat. no. 1.4404/316L gold-plated • Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyester - Option: 2 coats: Coat 1: Epoxy-based; coat 2: Polyester • Coating: The layer structure and thickness correspond to EN ISO 12944 Corrosion Class C3-M (for standard transmitter) and C5-H (for transmitter with double layer coating) • Stainless steel nameplate (1.4404/316L) Zinc-plated steel or stainless steel • Connection shank G1/2A according to EN 837-1 • Internal thread ½-14 NPT • Oval flange (PN 160 (MWP 2320 psi g)) with fastening thread: - 7/16-20 UNF according to EN 61518 - M10 according to DIN 19213 • Oval flange (PN 420 (MWP 2320 psi g)) with fastening thread: - 7/16-20 UNF according to EN 61518 - M12 according to DIN 19213 • External thread M20 × 1.5 and ½-14 NPT Cable entry via the following screw glands: • M20 × 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D¹⁾ • Device plug M12
Displays and controls Buttons Local display	4 buttons for operation directly on the device • With or without integrated local 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 mode $U_{SS} \leq 0.2 \text{ V}$ (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 as per ATEX • Intrinsic safety "i"	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.: 24 ACC NY 265 (option E85) No.: 20180920-MH61350 (option E84) No.: 0F9863.5C (option E60) No.: GYJ24.1046X (option E27) No.: BRA 22.GE0004X (option E25) No.: BVS 18 ATEX E 049X

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge pressure (pressure series)

Technical specifications (continued)

SITRANS P320/SITRANS P420 for gauge pressure (pressure series)	
- 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 • Explosion protection according to CSA - NAMUR recommendations • NE 06 • NE 21 • NE 23 • NE 43 • NE 53 • NE 80 • NE 105 • NE 107 • NE 131	II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$ $L_i = 0.24 \mu\text{H}/C_i = 3.29 \text{ nF}$ Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To a circuit with the operating values: $U_n = 10.5 \dots 45 \text{ V}$, $4 \dots 20 \text{ mA}$ 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: $U_n = 10.5 \dots 45 \text{ V}$, $4 \dots 20 \text{ mA}$ 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 a circuit with the operating values: $U_n = 10.5 \dots 30 \text{ V}$, $4 \dots 20 \text{ mA}$ No.: FM19US0155X No.: CSA18CA70163103 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 with Analog Output Signal Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics The Application of the Pressure Equipment Directive to Process Control Devices Requirements 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 / SITRANS P320/P420 / Gauge pressure (pressure series)

Technical specifications (continued)

Communication	
HART	
HART Protocol	230 ... 1 100 Ω
Software for computer	HART 7
Software for computer	SIMATIC PDM
PROFINET over Ethernet APL	
Name of the station	DCP protocol (default setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PA Profile Version 4.02
Device ID sender	Device ID 0x8310
Device ID sender	P320/P420 0x0B18
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	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 curve 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 mode

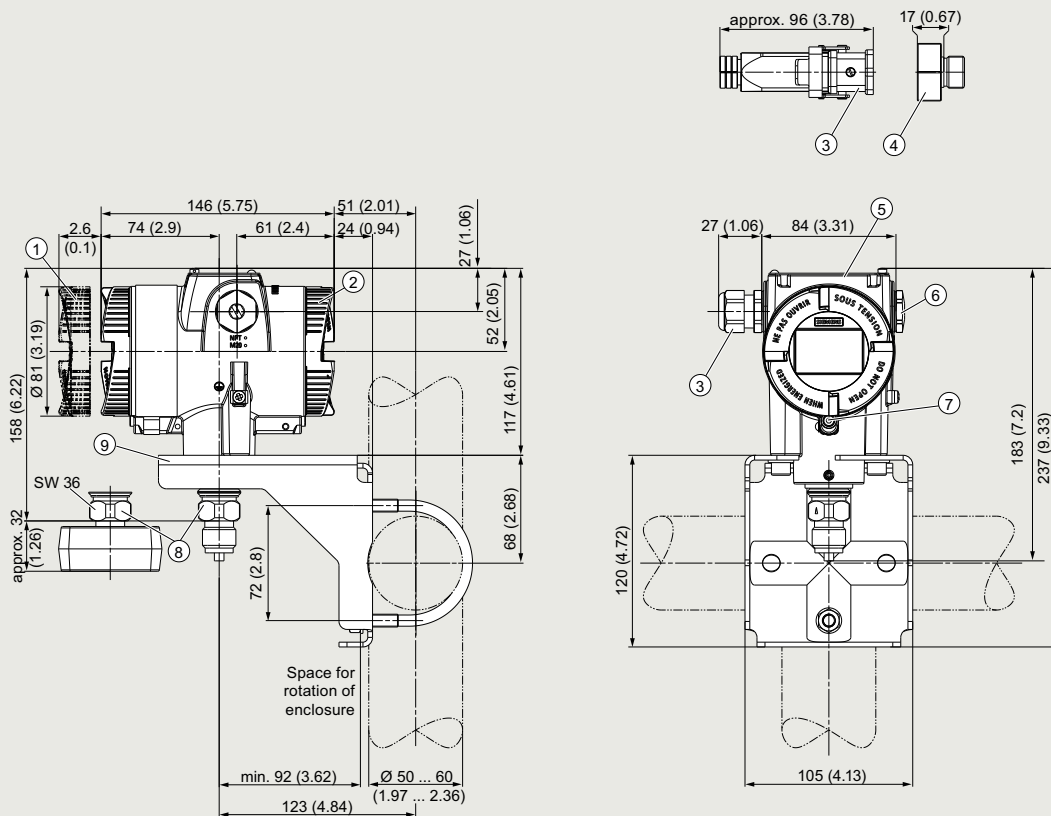
Communication	
PROFINET IO functions	
Number of DeviceAccess AR	1
Network diagnostics	via SNMP (Simple Network Management Protocol)
System redundancy	S2
Minimum device interval	32 ms
Support of start parameters	Yes
Diagnostic features	Advanced diagnostics incl. NAMUR NE107 support
FOUNDATION Fieldbus	
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)
- Failure behavior	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	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 mode

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge pressure (pressure series)

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)

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 + XPJ]"

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

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge pressure (differential pressure series)

Selection and ordering data

Pressure transmitters for gauge pressure (differential pressure series)										Article No.									
SITRANS P320										7MF031									
SITRANS P420										7MF041									
Click the article number for online configuration in the PIA Life Cycle Portal.																			
Communication																			
HART, 4 ... 20 mA										0									
PROFIBUS PA										1									
FOUNDATION Fieldbus (FF)										2									
Profibus over Ethernet-APL										5									
Measuring cell filling																			
Silicone oil										1									
Inert filling liquid										3									
Maximum measuring span																			
20 mbar (8.037 inH ₂ O)										B									
60 mbar (24.11 inH ₂ O)										D									
250 mbar (1005 inH ₂ O)										G									
600 mbar (241.1 inH ₂ O)										H									
1 600 mbar (643 inH ₂ O)										M									
5 000 mbar (2009 inH ₂ O)										P									
30 bar (435 psi)										R									
160 bar (2 320 psi)										Y									
Process connection																			
Oval flange, fastening thread: ⁷ / ₁₆ -20 UNF (IEC 61518)										L									
Oval flange, fastening thread: M10 (PN 160), (DIN 19213)										M									
Oval flange, fastening thread: ⁷ / ₁₆ -20 UNF (IEC 61518) with lateral ventilation										N									
Oval flange, fastening thread: M10 (PN 160) (DIN 19213) with lateral ventilation										P									
Material of wetted parts: Sensor body, seal diaphragm, process flange																			
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408										0									
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408										1									
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408										2									
Tantalum/tantalum, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))										4									
Monel 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))										6									
Stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))										8									
Material of non-wetted parts																			
Die-cast aluminum										1									
Stainless steel investment 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									
Intrinsic safety, 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 L (Zone model, Class Division)										T									
Electrical connections/cable entries																			
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																			
• 2 × M20 × 1.5										F									
• 2 × ½-14 NPT										M									
Local operation/display																			
Without local display (lid closed)										0									
With local display (lid closed)										1									

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge pressure (differential pressure series)

Selection and ordering data (continued)

Pressure transmitters for gauge pressure (differential pressure series)	Article No.
SITRANS P320	7MF031
SITRANS P420	7MF041
With local display (lid with glass pane)	
	2

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
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
Sealing plug included, plastic	A20
Sealing plug included, metal	A21
Sealing plug included, stainless steel	A22
Sealing plug included, stainless steel 316L/1.4404	A23
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	A30
Device plug Han 7D, mounted left (plastic, angled)	A31
Device plug Han 7D, mounted left (metal, straight)	A32
Device plug Han 7D, mounted left (metal, angled)	A33
Device plug Han 8D, mounted left (plastic, straight)	A34
Device plug Han 8D, mounted left (plastic, angled)	A35
Device plug Han 8D, mounted left (metal, straight)	A36
Device plug Han 8D, mounted left (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/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	A45
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	A48
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	A49
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	A90
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	A91
Cable gland/device plug mounted left	A97
Plug mounted right	A98
Cable gland/device plug mounted right	A99
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
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
Declaration of compliance with the order EN 10204-2.1: Compliance with order	C35
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66/IP68 (not for device plug 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
Extension of the medium temperature to -40 °C for measuring cell filling with inert filling liquid Please note step response time T63: 5.5 s (20 and 60 mbar); 1.4 s (250 and 600 mbar); 0.3 s (1.6 and 5 bar)	D52
Transmitter packaged in foil	D60
Cleaning the measuring cell, grease-free as per cleanliness level 2, DIN 25410; transmitter packaged in foil	D61
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packaged in foil; (particles < 50 mg/m²; oil and residual grease content HC < 100 mg/m²)	D62
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, UKCA, RCM) except EAC, FM, CSA, KC	E00
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KC	E09
Explosion protection approvals	
ATEX (Europe)	E20
CSA (USA and Canada) ¹⁾	E21

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge pressure (differential pressure series)

Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
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
CSA (Japan)	E29
ECASEX (UAE)	E32
UKEX (United Kingdom)	E33
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	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. 160 bar (2 320 psi) at 100 °C (212 °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	
Zinc-plated steel	H01
Stainless steel 1.4301/304	H02
Stainless steel 1.4404/316L	H03
Mounting bracket, zinc-plated steel, reinforced (KTA)	H05
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

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Flange connection options	
Flange connection and temperature extension	J76
Flange connection with epoxy resin coating	J77
Process flanges; special materials	
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 chambered with gaskets	
1 × chambered, graphite	K40
1 × chambered, PTFE (FDA compliant), recommended for gas measurements	K41
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE (Not permitted with remote seal attachment on both sides)	K50
O-ring, process flanges, FEP (with silicone core, approved for food, FDA compliant) (Not permitted with remote seal attachment on both sides)	K51
O-ring, process flanges, FFKM (FFPM) (Not permitted with remote seal attachment on both sides)	K52
O-ring, process flanges, NBR (Not permitted with remote seal attachment on both sides)	K53
O-ring, process flanges, EPDM (Not permitted with remote seal attachment on both sides)	K54
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, measuring medium: Gas	K85
Oval flange attached, PTFE seal + fixing 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
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	Y01
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
TAG short (device parameters, max. 8 characters)	Y17
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	Y21
Local display: Scaling with standard units [m³/s, l/s, m, inch, ...], example 1 ... 5 m	Y22
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	Y32

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge pressure (differential pressure series)

Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
ID number of special design	Y99

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

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	160 bar	240 bar
	0.1 ... 2 kPa	16 MPa	24 MPa
	0.4019 ... 8.037 inH ₂ O	2 320 psi	3 481 psi
	1 ... 60 mbar	160 bar	240 bar
	0.1 ... 6 kPa	16 MPa	24 MPa
	0.4019 ... 24.11 inH ₂ O	2 320 psi	3 481 psi
	2.5 ... 250 mbar	160 bar	240 bar
	0.2 ... 25 kPa	16 MPa	24 MPa
	1.005 ... 100.5 inH ₂ O	2 320 psi	3 481 psi
	6 ... 600 mbar	160 bar	240 bar
	0.6 ... 60 kPa	16 MPa	24 MPa
	2.41 ... 241.1 inH ₂ O	2 320 psi	3 481 psi
	16 ... 1 600 mbar	160 bar	240 bar
	1.6 ... 160 kPa	16 MPa	24 MPa
	6.43 ... 643 inH ₂ O	2 320 psi	3 481 psi
	50 ... 5 000 mbar	160 bar	240 bar
	5 ... 500 kPa	16 MPa	24 MPa
	20.09 ... 2 009 inH ₂ O	2 320 psi	3 481 psi
	0.3 ... 30 bar	160 bar	240 bar
	0.03 ... 3 MPa	16 MPa	24 MPa
	4.35 ... 435 psi	2 320 psi	3 481 psi
	8 ... 160 bar	160 bar	240 bar
	0.8 ... 16 MPa	16 MPa	24 MPa
	116 ... 2 320 psi	2 320 psi	3 481 psi
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a		
- Measuring cell with inert fill oil	30 mbar a/3 kPa a/0.44 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)		
Output	HART		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory set 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, infinitely adjustable over remote operation		
	0 ... 100 s, in increments of 0.1 s, adjustable over local display		
• Current simulator	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 : Auxiliary power in V		
• With HART communication	$R = 230 \dots 1100 \text{ } \Omega$		
Characteristic curve	• Linearly increasing or linearly decreasing		
Physical bus	-		
Polarity-independent	-		

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for gauge pressure (differential 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)

Characteristic curve deviation at limit point setting, including hysteresis and repeatability

Measuring span ratio r (spread, turn-down)

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

Linear characteristic curve

• 20 mbar/2 kPa/8.031 inH₂O

$r \leq 1.5$: $\leq 0.055\%$ (SITRANS P320)
 $\leq 0.05\%$ (SITRANS P420)

• 60 mbar/6 kPa/24.09 inH₂O

$1.5 < r \leq 20$: $\leq (0.005 \cdot r + 0.05)\%$

$r \leq 2$: $\leq 0.055\%$ (SITRANS P320)
 $\leq 0.04\%$ (SITRANS P420)

• 250 mbar/25 kPa/3.6 psi

$2 < r \leq 60$: $\leq (0.005 \cdot r + 0.05)\%$

$r \leq 2$: $\leq 0.055\%$ (SITRANS P320)
 $\leq 0.04\%$ (SITRANS P420)

• 600 mbar/60 kPa/240.9 in H₂O
 1 600 mbar/160 kPa/642.4 in H₂O
 5 000 mbar/500 kPa/2008 in H₂O
 30 bar/3 MPa/435 psi

$2 < r \leq 100$: $\leq (0.005 \cdot r + 0.05)\%$ (SITRANS P320)
 $\leq (0.005 \cdot r + 0.05)\%$ (SITRANS P420)

$r \leq 5$: $\leq 0.055\%$ (SITRANS P320)
 $\leq 0.04\%$ (SITRANS P420)

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

• 160 bar/16 MPa/2 320 psi

$r \leq 5$: $\leq 0.055\%$ (SITRANS P320)
 $\leq 0.04\%$ (SITRANS P420)

$5 < r \leq 20$: $\leq (0.004 \cdot r + 0.045)\%$

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

• 20 mbar/2 kPa/8.031 inH₂O

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

• 60 mbar/6 kPa/24.09 inH₂O

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

• 250 mbar/25 kPa/3.6 psi
 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

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

• 250 mbar/25 kPa/3.6 psi
 5 000 mbar/500 kPa/2008 inH₂O

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

• 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

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

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

• 20 mbar/2 kPa/8.031 inH₂O

In 5 years $\leq (0.15 \cdot r)\%$
 In 10 years $\leq (0.25 \cdot r)\%$
 In 15 years $\leq (0.35 \cdot r)\%$

• 60 mbar/6 kPa/24.09 inH₂O

In 5 years $\leq (0.15 \cdot r)\%$
 In 10 years $\leq (0.25 \cdot r)\%$
 In 15 years $\leq (0.35 \cdot r)\%$

• 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

In 5 years $\leq (0.05 \cdot r)\%$
 In 10 years $\leq (0.1 \cdot r)\%$
 In 15 years $\leq (0.15 \cdot r)\%$

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

• 20 mbar/2 kPa/8.031 inH₂O

Approx. 0.160 s

• 60 mbar/6 kPa/24.09 inH₂O

Approx. 0.150 s

• 250 mbar/25 kPa/3.6 psi
 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. 0.135 s

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge pressure (differential pressure series)

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for gauge pressure (differential pressure series)	
Effect of mounting position (in pressure per change of angle)	$\leq 0.7 \text{ mbar}/0.07 \text{ kPa}/0.010 \text{ psi}$ 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	-40 ... +100 °C (-40 ... +212 °F)
- Measuring cell 30 bar (435 psi)	-20 ... +100 °C (-4 ... +212 °F)
- Measuring cell 160 bar (2 320 psi)	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with inert fill oil	-20 ... +100 °C (-4 ... +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 fill oil	-40 ... +85 °C (-40 ... +185 °F)
- Local display	-20 ... +80 °C (-4 ... +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Structural design	
Weight	- Aluminum enclosure: Approx. 3.9 kg (8.5 lb) - Stainless steel enclosure: Approx. 5.9 kg (13 lb)
Material	
• Material of wetted parts	
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
- Process flanges	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
- Sealing plug	1.4404 or as option alloy C22; 2.4602 or Monel mat. no. 2.4360
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
• Material of non-wetted parts	
- 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 polyester - Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyester - Stainless steel nameplate (1.4404/316L)
- Process flange screws	Stainless steel ISO 3506-1 A4-70
- Mounting bracket	Steel, zinc-plated steel, or stainless steel
Process connection	1/4-18 NPT internal 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 screw glands: - M20 × 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
Local display	- With or without integrated local 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 mode
Ripple	$U_{SS} \leq 0.2 \text{ V}$ (47 ... 125 Hz)
Noise	$U_{eff} \leq 1.2 \text{ mV}$ (0.5 ... 10 kHz)
Auxiliary power	—
Separate supply voltage	—

Technical specifications (continued)

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

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 as per ATEX

- 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

- Explosion protection according to CSA

NAMUR recommendations

- NE 06

- NE 21

- NE 23

- NE 43

- NE 53

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.: 24 ACC NY 265 (option E85)

No.: 20180920-MH61350 (option E84)

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

No.: GYJ24.1046X (option E27)

No.: BRA 22.GE0004X (option E25)

No.: BVS 18 ATEX E 049X

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

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

-40 ... +55 °C (-40 ... +131 °F) temperature class T6

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

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

To certified intrinsically safe circuits with peak values:

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

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

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

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

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

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

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

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

To a circuit with the operating values: $U_n = 10.5 \dots 45 \text{ V}$, $4 \dots 20 \text{ mA}$

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

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 a circuit with the operating values: $U_n = 10.5 \dots 30 \text{ V}$, $4 \dots 20 \text{ mA}$

No.: FM19US0155X

No.: CSA18CA70163103

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 with Analog Output Signal

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

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge pressure (differential pressure series)

Technical specifications (continued)

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

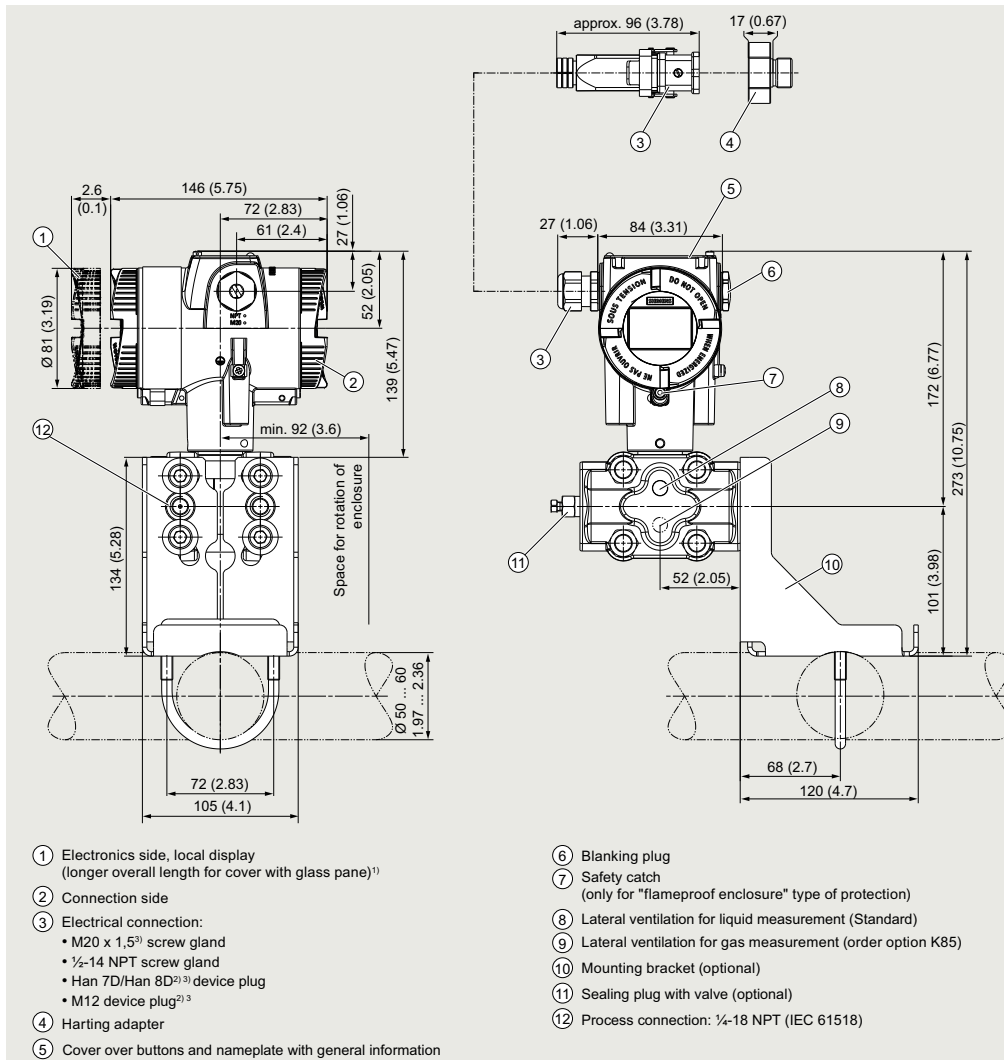
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Requirements for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

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

Communication	
HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
PROFINET over Ethernet APL	
Name of the station	DCP protocol (default setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PA Profile Version 4.02 Device ID 0xB310
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
- 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 curve 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 mode

Communication	
PROFINET IO functions	
Number of DeviceAccess AR	1
Network diagnostics	via SNMP (Simple Network Management Protocol)
System redundancy	S2
Minimum device interval	32 ms
Support of start parameters	Yes
Diagnostic features	Advanced diagnostics incl. NAMUR NE107 support
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)
- Failure behavior	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	1 transducer block Pressure with calibration, 1 transducer block LCD
- 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 mode

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 + XPJ]"

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

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge and absolute pressure, flush-mounted

Selection and ordering data

Pressure transmitters for gauge and absolute pressure, with flush mounted diaphragm										Article No.												
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 the article number for online configuration in the PIA Life Cycle Portal.																						
Communication																						
HART, 4 ... 20 mA																				0		
PROFIBUS PA																				1		
FOUNDATION Fieldbus (FF)																				2		
Profibus over Ethernet-APL																				5		
Measuring cell filling																						
Silicone oil																				1		
Inert filling liquid																				3		
Neobee oil																				4		
Maximum measuring span																						
1 000 mbar (14.5 psi)																				J		
4 000 mbar (58 psi)																				N		
16 bar (232 psi)																				Q		
63 bar (914 psi)																				T		
1 300 mbar a (18.9 psi a)																				L		
5 000 mbar a (72.5 psi a)																				P		
30 bar a (435 psi a)																				R		
Process connection																						
Flush-mounted diaphragm																				K		
Material of wetted parts: 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		
Material of non-wetted parts																						
Die-cast aluminum																				1		
Stainless steel investment 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	
Intrinsic safety, 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 L (Zone model, Class Division)																					T	
Electrical connections/cable entries																						
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																						
• 2 × M20 × 1.5																					F	
• 2 × ½-14 NPT																					M	
Local operation/display																						
Without local display (lid closed)																					0	
With local display (lid closed)																					1	
With local display (lid with glass pane)																					2	

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge and absolute pressure, flush-mounted

Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
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
Sealing plug included, plastic	A20
Sealing plug included, metal	A21
Sealing plug included, stainless steel	A22
Sealing plug included, stainless steel 316L/1.4404	A23
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	A30
Device plug Han 7D, mounted left (plastic, angled)	A31
Device plug Han 7D, mounted left (metal, straight)	A32
Device plug Han 7D, mounted left (metal, angled)	A33
Device plug Han 8D, mounted left (plastic, straight)	A34
Device plug Han 8D, mounted left (plastic, angled)	A35
Device plug Han 8D, mounted left (metal, straight)	A36
Device plug Han 8D, mounted left (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/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	A45
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm ² , with Jacob cable entry (straight for p, angled for dp)	A48
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm ² , with Lapp cable entry (straight for p, angled for dp)	A49
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	A90
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	A91
Cable gland/device plug mounted left	A97
Plug mounted right	A98
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

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
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
Declaration of compliance with the order EN 10204-2.1: Compliance with order	C35
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66/IP68 (not for device plug 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
Transmitter packaged in foil	D60
Cleaning the measuring cell, grease-free as per cleanliness level 2, DIN 25410; transmitter packaged in foil	D61
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packaged in foil; (particles < 50 mg/m ³ ; oil and residual grease content HC < 100 mg/m ³)	D62
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, UKCA, RCM) except EAC, FM, CSA, KC	E00
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KC	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
CSA (Japan)	E29
ECASEx (UAE)	E32
UKEX (United Kingdom)	E33
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	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

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge and absolute pressure, flush-mounted

Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
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	
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
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 screwed connector	
• 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

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
• 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
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 gasket	Q00
• TG 52/150 PN 40 with gasket	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	
External thread G¾-A DIN 3852-2 form A	R11
External thread G1-A DIN 3852-2 form A	R12
External thread G2-A DIN 3852-2 form A	R14
Special options flush mounted	
Cooling extension (media temperature up to 200 °C)	R85
Mating connector including gasket	R90
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	Y01
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
TAG short (device parameters, max. 8 characters)	Y17
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	Y21
Local display: Scaling with standard units [m³/s, l/s, m, inch, ...]; example 1 ... 5 m	Y22
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	Y32
ID number of special design	Y99

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

Technical specifications

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

Input of gauge pressure with flush-mounted diaphragm

Measured variable

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

Gauge pressure

Measuring span

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

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

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

Measuring limits

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

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

Input of absolute pressure, with flush-mounted diaphragm

Measured variable

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

Absolute pressure

Measuring span

43 ... 1300 mbar a
 4.3 ... 130 kPa a
 17 ... 525 inH₂O a
 166 ... 5 000 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

Max. permissible operating pressure MAWP (PS)

Maximum permissible test pressure

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

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

Measuring limits

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

Lower range value

0 bar a/0 kPa a/0 psi a
 100% of max. measuring span
 Between the measuring limits (infinitely adjustable)

Output

Output signal

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

Adjustable damping

- Current simulator
- Failure signal

Load

- Without HART communication

- With HART communication

Characteristic curve

Physical bus

Polarity-independent

HART

4 ... 20 mA

3.55 mA, factory set 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, infinitely adjustable over remote operation

0 ... 100 s, in increments of 0.1 s, adjustable over local 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 : Auxiliary power in V $R = 230 \dots 1100 \Omega$

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

-

-

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge and absolute pressure, flush-mounted

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush mounted diaphragm		
Gauge pressure measuring accuracy, with flush mounted diaphragm		
Reference conditions	• According to 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)	
Characteristic curve deviation at limit point setting, including hysteresis and repeatability	r = maximum measuring span/set measuring span or nominal measuring range	
Measuring span ratio r (spread, turn-down)		
<u>Linear characteristic curve</u>		
• 1 bar/100 kPa/14.5 psi • 4 bar/400 kPa/58 psi • 16 bar/1.6 MPa/232 psi • 63 bar/6.3 MPa/914 psi	r ≤ 5:	≤ 0.055% (SITRANS P320) ≤ 0.05% (SITRANS P420)
	5 < r ≤ 100:	≤ (0.005 · r + 0.05)%
<u>Effect of ambient temperature</u> in % per 28 °C (50 °F)		
• 1 bar/100 kPa/14.5 psi • 4 bar/400 kPa/58 psi • 16 bar/1.6 MPa/232 psi • 63 bar/6.3 MPa/914 psi	≤ (0.08 · r + 0.16)%	
Influence of the medium temperature (in pressure per 10K of temperature difference between the medium temperature and ambient temperature)	3 mbar/0.3 kPa/0.04 psi per 10 K	
<u>Long-term stability at ±30 °C (± 54 °F)</u>		
• 1 bar/100 kPa/14.5 psi • 4 bar/400 kPa/58 psi	In 5 years ≤ (0.15 · r)% In 10 years ≤ (0.25 · r)% In 15 years ≤ (0.35 · r)%	
• 16 bar/1.6 MPa/232 psi • 63 bar/6.3 MPa/914 psi	In 5 years ≤ (0.15 · r)% In 10 years ≤ (0.25 · r)% In 15 years ≤ (0.35 · r)%	
Step response time T ₆₃ (without electrical damping)	≤ 0.105 s	
Effect of mounting position (in pressure per change of angle)	0.4 mbar/0.04 kPa/0.006 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	
Absolute pressure measuring accuracy with flush mounted 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)	
Characteristic curve deviation at limit point setting, including hysteresis and repeatability	r = maximum measuring span/set measuring span or nominal measuring range	
Measuring span ratio r (spread, turn-down)		
• Linear characteristic curve	r ≤ 5:	≤ 0.075% (SITRANS P320) ≤ 0.065% (SITRANS P420)
- All measuring cells	5 < r ≤ 30:	≤ (0.005 · r + 0.05)%
Influence of ambient temperature in % per 28 °C (50 °F)		
• All measuring cells	≤ (0.08 · r + 0.16)% gauge pressure ≤ (0.16 · r + 0.24)% absolute pressure	
Influence of the medium temperature (in pressure per 10K of temperature difference between the medium temperature and ambient temperature)	3 mbar/0.3 kPa/0.04 psi per 10 K	
<u>Long-term stability at ±30 °C (± 54 °F)</u>		
• All measuring cells	In 5 years ≤ (0.25 · r)% In 10 years ≤ (0.40 · r)% In 15 years ≤ (0.50 · 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 offset is possible with position error compensation)	
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V	

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush mounted diaphragm	
Operating conditions	
Medium temperature ²⁾	
• Measuring cell with silicone oil filling	-40 ... +150 °C (-40 ... +302 °F) -40 ... +200 °C (-40 ... +392 °F) with temperature decoupler
• Measuring cell with inert fill oil	-20 ... +100 °C (-4 ... +212 °F)
• Measuring cell with FDA compliant fill oil	-10 ... +150 °C (14 ... 302 °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 fill oil (different pressure classes)	1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi -40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with FDA compliant fill oil	-10 ... +85 °C (14 ... +185 °F)
- Local display	-20 ... +80 °C (-4 ... +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA compliant fill 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	Pressure transmitter without mounting flange • Aluminum enclosure: Approx. 1.8 kg (3.9 lb) • Stainless steel enclosure: Approx. 3.8 kg (8.3 lb)
Material	
• Material of wetted parts	
- Process connection	Stainless steel, mat. no. 1.4404/316L
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L or Alloy C276, mat. no. 2.4819
• Material of non-wetted parts	
- 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 polyester Option: 2 coats: Coat 1: Epoxy-based; coat 2: Polyester • Stainless steel nameplate (1.4404/316L)
Process connection	• Flanges according to EN and ASME • F&B and pharmaceutical flanges • BioConnect/BioControl • PMC style
Electrical connection	Cable entry via the following screw glands: • M20 × 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D ³⁾ • Device plug M12
Displays and controls	
Buttons	4 buttons for operation directly on the device
Local display	• With or without integrated local 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 for intrinsically safe operation
Ripple	U _{SS} ≤ 0.2 V (47 ... 125 Hz)
Noise	U _{eff} ≤ 1.2 mV (0.5 ... 10 kHz)
Auxiliary power	–
Separate supply voltage	–
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 24 ACC NY 265 (option E85)

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge and absolute pressure, flush-mounted

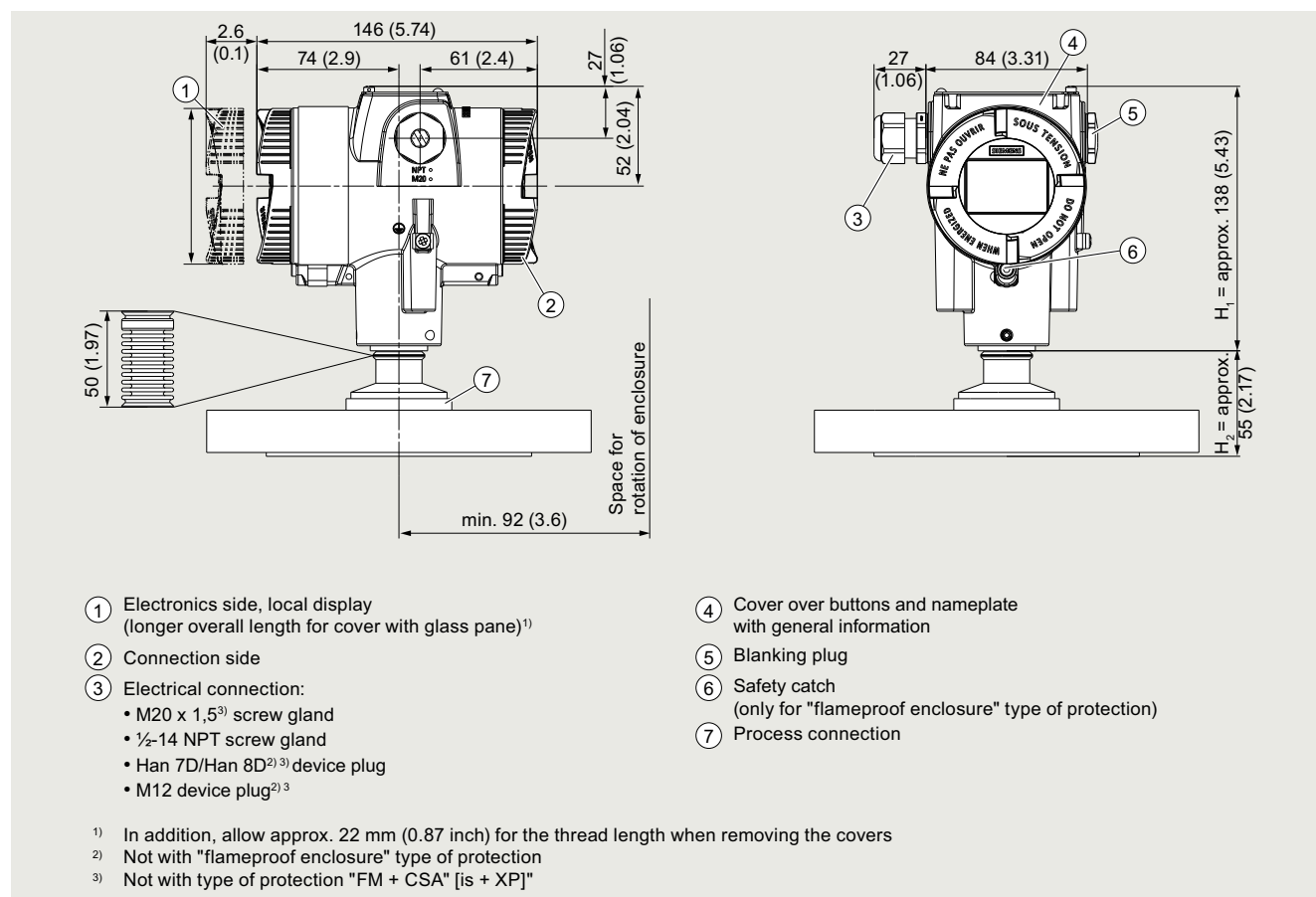
Technical specifications (continued)

SITRANS P320 / SITRANS P420 for gauge and absolute pressure, with flush mounted diaphragm	
• NSF (USA) • CRN (Canada) • EHEDG - Explosion protection acc. to NEPSI (China) - Explosion protection acc. to INMETRO (Brazil) - Explosion protection as per ATEX • 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 • Explosion protection according to CSA - NAMUR recommendations • NE 06 • NE 21 • NE 23 • NE 43 • NE 53 • NE 80 • NE 105 • NE 107 • NE 131	No.: 20180920-MH61350 (option E84) No.: 0F9863.5C (option E60) No. EHEDG-C2300082 No.: GYJ24.1046X (option E27) No.: BRA 22.GE0004X (option E25) No.: BVS 18 ATEX E 049X II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H}/C_i = 3.29 \text{ nF}$ Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To a circuit with the operating values: $U_n = 10.5 \dots 45 \text{ V}$, $4 \dots 20 \text{ mA}$ 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: $U_n = 10.5 \dots 45 \text{ V}$, $4 \dots 20 \text{ mA}$ 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 a circuit with the operating values: $U_n = 10.5 \dots 30 \text{ V}$, $4 \dots 20 \text{ mA}$ No.: FM19US0155X No.: CSA18CA70163103 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 with Analog Output Signal Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics The Application of the Pressure Equipment Directive to Process Control Devices Requirements 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

Technical specifications (continued)

- 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.

Dimensional drawings



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.

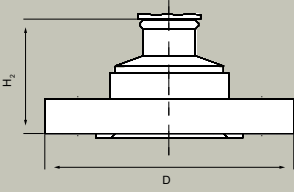
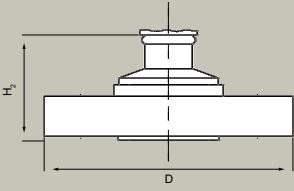
Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge and absolute pressure, flush-mounted

Dimensional drawings (continued)

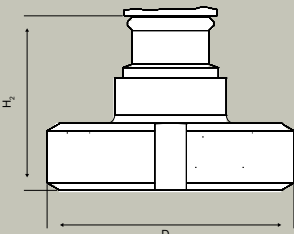
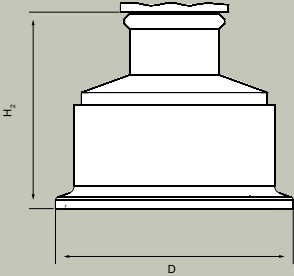
Flanges according to EN and ASME

Flange	Order code	DN	PN	ØD	H ₂
EN 1092-1 	M03	50	16	165 mm (6.5 inches)	Approx. 52 mm (2 inches)
	M05	80	16	200 mm (7.9 inches)	
	M10	25	40	115 mm (4.5 inches)	
	M12	40	40	150 mm (5.9 inches)	
	M13	50	40	165 mm (6.5 inches)	
	M15	80	40	200 mm (7.9 inches)	
	M22	40	100	170 mm (6.7 inches)	
ASME B16.5 	M30	1 inch	150	110 mm (4.3 inches)	Approx. 52 mm (2 inches)
	M31	1½ inches	150	125 mm (4.9 inches)	
	M32	2 inches	150	150 mm (5.9 inches)	
	M33	3 inches	150	190 mm (7.5 inches)	
	M34	4 inches	150	230 mm (9.1 inches)	
	M36	1½ inches	300	155 mm (6.1 inches)	
	M37	2 inches	300	165 mm (6.5 inches)	
	M38	3 inches	300	210 mm (8.1 inches)	
	M39	4 inches	300	255 mm (10.0 inches)	

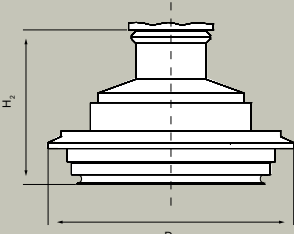
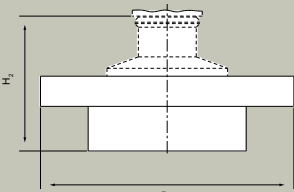
Dimensional drawings (continued)

NuG and pharmaceutical connections

Connections according to DIN

Connection	Order code	DN	PN	ØD	H ₂
DIN 11851 (dairy connection with slotted union nut) 	N03 N05	50 80	25 25	92 mm (3.6 inches) 127 mm (5.0 inches)	Approx. 52 mm (2 inches)
Tri-Clamp acc. to DIN 32676 	N14 N15 N22 N23	50 65 2 inches 3 inches	16 16 16 10	64 mm (2.5 inches) 91 mm (3.6 inches) 64 mm (2.5 inches) 91 mm (3.6 inches)	Approx. 52 mm (2 inches)

Other connections

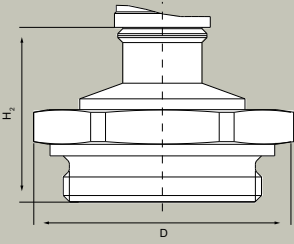
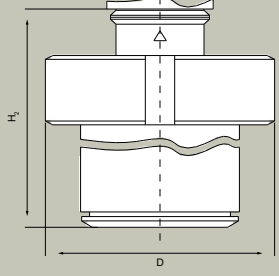
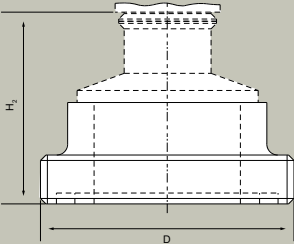
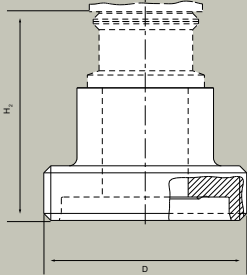
Connection	Order code	DN	PN	ØD	H ₂
Varivent connection 	P06	40 ... 125	40	84 mm (3.3 inches)	Approx. 52 mm (2 inches)
Sanitary process connection according to DRD 	Q15	65	40	105 mm (4.1 inches)	Approx. 52 mm (2 inches)
Threaded connection G3/4", G1" and G2" according to DIN 3852-2 form A 	R11	3/4 inch	60	37 mm (1.5 inches)	Approx. 45 mm (1.8 inches)

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge and absolute pressure, flush-mounted

Dimensional drawings (continued)

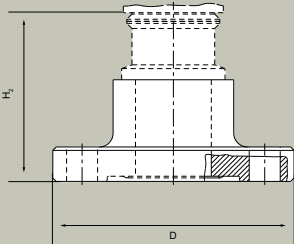
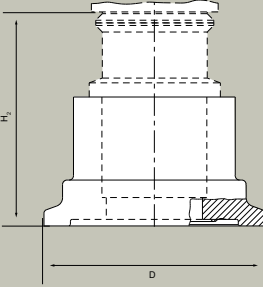
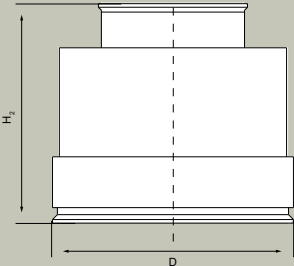
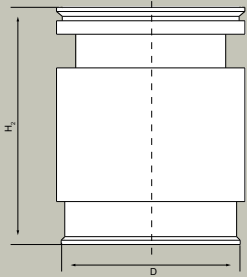
Connection	Order code	DN	PN	ØD	H ₂
	R12	1 inch	60	48 mm (1.9 inches)	Approx. 47 mm (1.9 inches)
	R14	2 inches	60	78 mm (3.1 inches)	Approx. 52 mm (2 inches)
Tank connection TG 52/50 and TG52/150 	Q00	25	40	63 mm (2.5 inches)	Approx. 63 mm (2.5 inches)
	Q01	25	40	63 mm (2.5 inches)	Approx. 170 mm (6.7 inches)
SMS screwed connector 	Q28	2 inches	25	70 mm x 1/6 inch	Approx. 52 mm (2.1 inches)
	Q29	2½ inches	25	85 mm x 1/6 inch	
	Q30	3 inches	25	98 mm x 1/6 inch	
Aseptic screwed connector according to DIN 11864-1 form A 	N33	50	25	78 mm x 1/6 inch	Approx. 52 mm (2.1 inches)
	N34	65	25	95 mm x 1/6 inch	
	N35	80	25	110 mm x ¼ inch	
	N36	100	25	130 mm x ¼ inch	
Aseptic flange with notch according to DIN 11864-2 form A	N43	50	16	94 mm (3.7 inches)	Approx. 52 mm (2.1 inches)
	N44	65	16	113 mm (4.4 inches)	
	N45	80	16	133 mm (5.2 inches)	

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Gauge and absolute pressure, flush-mounted

Dimensional drawings (continued)

Connection	Order code	DN	PN	ØD	H ₂
	N46	100	16	159 mm (6.3 inches)	Approx. 52 mm (2.1 inches)
Aseptic clamp with groove according to DIN 11864-3 form A 	N53 N54 N55 N56	50 65 80 100	25 25 16 16	77.5 mm (3.1 inches) 91 mm (3.6 inches) 106 mm (4.2 inches) 130 mm (5.1 inches)	Approx. 52 mm (2.1 inches)
Process connection PMC style standard 	R00	-	-	40.9 mm (1.6 inches)	Approx. 36.8 mm (1.4 inches)
Process connection PMC style minibolt 	R01	-	-	26.3 mm (1.0 inch)	Approx. 33.1 mm (1.3 inches)

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Absolute pressure (pressure series)

Selection and ordering data

Pressure transmitters for absolute pressure (pressure series)										Article No.									
SITRANS P320										7MF032									
SITRANS P420										7MF042									
Click the article number for online configuration in the PIA Life Cycle Portal.																			
Communication																			
HART, 4 ... 20 mA										0									
PROFIBUS PA										1									
FOUNDATION Fieldbus (FF)										2									
Profibus over Ethernet-APL										5									
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																			
External thread M20 × 1.5										B									
External thread G½ (EN 837-1)										D									
Internal thread ½-14 NPT										E									
External thread ½-14 NPT										F									
Oval flange, fastening thread: 7/16"-20 UNF (IEC 61518)										G									
Oval flange, fastening thread: M10 (DIN 19213)										H									
Oval flange, fastening thread: M12 (DIN 19213)										J									
Version for diaphragm seal pressure										U									
Material of wetted parts: Process connection, seal diaphragm																			
Stainless steel 316L/1.4404, stainless steel 316L/1.4404										0									
Stainless steel 16L/1.4404, alloy C276/2.4819										1									
Alloy C22/2.4602, alloy C276/2.4819										2									
Stainless steel 316L/1.4404, stainless steel 316L/1.4404 gold-plated										7									
Material of non-wetted parts																			
Die-cast aluminum										1									
Stainless steel investment 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									
Intrinsic safety, 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 L (Zone model, Class Division)										T									
Electrical connections/cable entries																			
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																			
• 2 × M20 × 1.5										F									
• 2 × ½-14 NPT										M									
Local operation/display																			
Without local display (lid closed)										0									
With local display (lid closed)										1									

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Absolute pressure (pressure series)

Selection and ordering data (continued)

Pressure transmitters for absolute pressure (pressure series)	Article No.
SITRANS P320	7MF032 ● - ● ● ● ● ● - ● ● ● ●
SITRANS P420	7MF042 ● - ● ● ● ● ● - ● ● ● ●
With local display (lid with glass pane)	
	2

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
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
Sealing plug included, plastic	A20
Sealing plug included, metal	A21
Sealing plug included, stainless steel	A22
Sealing plug included, stainless steel 316L/1.4404	A23
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	A30
Device plug Han 7D, mounted left (plastic, angled)	A31
Device plug Han 7D, mounted left (metal, straight)	A32
Device plug Han 7D, mounted left (metal, angled)	A33
Device plug Han 8D, mounted left (plastic, straight)	A34
Device plug Han 8D, mounted left (plastic, angled)	A35
Device plug Han 8D, mounted left (metal, straight)	A36
Device plug Han 8D, mounted left (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/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	A45
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	A48
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	A49
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	A90
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	A91
Cable gland/device plug mounted left	A97
Plug mounted right	A98
Cable gland/device plug mounted right	A99
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
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
Declaration of compliance with the order EN 10204-2.1: Compliance with order	C35
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66/IP68 (not for device plug 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
Transmitter packaged in foil	D60
Cleaning the measuring cell, grease-free as per cleanliness level 2, DIN 25410; transmitter packaged in foil	D61
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packaged in foil; (particles < 50 mg/m²; oil and residual grease content HC < 100 mg/m²)	D62
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, UKCA, RCM) except EAC, FM, CSA, KC	E00
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KC	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

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Absolute pressure (pressure series)

Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
INMETRO (Brazil)	E25
KCs (Korea)	E26
NEPSI (China)	E27
PESO (India)	E28
CSA (Japan)	E29
ECASEx (UAE)	E32
UKEX (United Kingdom)	E33
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	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. 160 bar (2 320 psi) at 100 °C (212 °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	
Zinc-plated steel	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 water trap 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

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
Valve manifold gaskets (in place of standard gaskets FKM (FPM))	
Gasket (EN 837-1) material Fe (soft iron)	K60
Gasket (EN 837-1) material 1.4571	K61
Gasket (EN 837-1) material Cu	K62
Process connection	
Process connection external thread G½, bore hole 11 mm	K80
Oval flange included, PTFE gasket + fixing screws	K86
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 internal 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 sealing ring, steel fixing 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 sealing ring, stainless steel fixing screws, pressure test certified in factory certificate (EN 10204-2.2)	T06
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	Y01
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
TAG short (device parameters, max. 8 characters)	Y17
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	Y21
Local display: Scaling with standard units [m³/s, l/s, m, inch, ...]; example 1 ... 5 m	Y22
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	Y32
ID number of special design	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 / SITRANS P320/P420 / Absolute pressure (pressure series)

Technical specifications

SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)			
Input			
Measured variable 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)	Absolute pressure		
	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 ... 5 000 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		
	- Measuring cell with inert fill oil		
	• Upper measuring limit		
	• Lower range value		
Output	HART		
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory set 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} ≤ 0.5% of max. output current		
Adjustable damping	0 ... 100 s, infinitely adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over local display		
• Current simulator	3.55 ... 22.8 mA		
• Failure signal	3.55 ... 22.8 mA (factory set to 3.55 mA)		
Load	Resistance R [Ω]		
• Without HART communication	R = (U _H - 10.5 V) / 22.8 mA, U _H : Auxiliary power in V R = 230 ... 1100 Ω		
• With HART communication			
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)		
Physical bus	-		
Polarity-independent	-		
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)		
Characteristic curve deviation at limit point setting, including hysteresis and repeatability			

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Absolute pressure (pressure series)

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)	
Measuring span ratio r (spread, turn-down) <u>Linear characteristic curve (all measuring cells)</u> • $r \leq 2$	r = maximum measuring span/set measuring span or nominal measuring range 250 mbar a $\leq 0.1\%$ (SITRANS P320) $\leq 0.075\%$ (SITRANS P420) 1.3 bar a, 5 bar a, 30 bar a, $\leq 0.065\%$ (SITRANS P320) 160 bar a, 400 bar a and 700 bar a $\leq 0.055\%$ (SITRANS P420)
• $2 < r \leq 30$	250 mbar a $\leq (0.01 \cdot r + 0.08)\%$ (SITRANS P320) $\leq (0.01 \cdot r + 0.08)\%$ (SITRANS P420) 1.3 bar a, 5 bar a, 30 bar a, $\leq (0.005 \cdot r + 0.05)\%$ (SITRANS P320) 160 bar a, 400 bar a and 700 bar a $\leq (0.005 \cdot r + 0.05)\%$ (SITRANS P420)
<u>Effect of ambient temperature</u> (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	$\leq (0.15 \cdot r + 0.1)\%$ $\leq (0.08 \cdot r + 0.16)\%$
<u>Long-term stability at ± 30 °C (± 54 °F)</u> • 250 mbar a and 1.3 bar a	In 5 years $\leq (0.25 \cdot r)\%$ In 10 years $\leq (0.40 \cdot r)\%$ In 15 years $\leq (0.50 \cdot r)\%$
• 5 bar a, 30 bar a, 160 bar a, 400 bar a and 700 bar a	In 5 years $\leq (0.1 \cdot r)\%$ In 10 years $\leq (0.15 \cdot r)\%$ In 15 years $\leq (0.20 \cdot r)\%$
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 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 with inert fill liquid Ambient conditions • Ambient temperature/enclosure - Measuring cell with silicone oil filling - Measuring cell with inert fill liquid - Local 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	-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) 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 fill oil: -20 ... +85 °C (-4 ... +185 °F)) ²⁾ 4K4H IP66, IP68 Type 4X According to IEC 61326 and NAMUR NE 21
Structural design Weight Material • Material of wetted parts - Process connection - Oval flange - Seal diaphragm • Material of non-wetted parts - Electronics enclosure - Mounting bracket	• Aluminum enclosure: Approx. 1.8 kg (3.9 lb) • Stainless steel enclosure: Approx. 3.8 kg (8.3 lb) Stainless steel, mat. no. 1.4404/316L or Alloy C22, mat. no. 2.4602 Stainless steel, mat. no. 1.4404/316L Stainless steel, mat. no. 1.4404/316L or Alloy C276, mat. 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 polyester Option: 2 coats: Coat 1: Epoxy-based; coat 2: Polyester • Stainless steel nameplate (1.4404/316L) Zinc-plated steel or stainless steel

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)	
Process connection	• Connection shank G1/2A according to EN 837-1 • Internal thread 1/2-14 NPT • Oval flange (PN 160 (MWP 2320 psi g)) with fastening thread: - 7/16-20 UNF according to EN 61518 - M10 according to DIN 19213 • Oval flange (PN 420 (MWP 2320 psi g)) with fastening thread: - 7/16-20 UNF according to EN 61518 - M12 according to DIN 19213 • External thread M20 × 1.5 and 1/2-14 NPT
Electrical connection	Cable entry via the following screw glands: • M20 × 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
Local display	• With or without integrated local 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 mode
Ripple	U _{SS} ≤ 0.2 V (47 ... 125 Hz)
Noise	U _{eff} ≤ 1.2 mV (0.5 ... 10 kHz)
Auxiliary power	—
Separate supply voltage	—
Certificates and approvals	
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)
Drinking water	
• WRAS (England)	No.: 1903094 (option E83)
• ACS (France)	No.: 24 ACC NY 265 (option E85)
• NSF (USA)	No.: 20180920-MH61350 (option E84)
• CRN (Canada)	No.: 0F9863.5C (option E60)
Explosion protection acc. to NEPSI (China)	No.: GYJ24.1046X (option E27)
Explosion protection acc. to INMETRO (Brazil)	No.: BRA 22.GE0004X (option E25)
Explosion protection as per ATEX	No.: BVS 18 ATEX E 049X
• 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 V, I _i = 101 mA, P _i = 760 mW U _i = 29 V, I _i = 110 mA, P _i = 800 mW L _i = 0.24 μH/C _i = 3.29 nF
- Effective internal inductance/capacitance	
• Flameproof enclosure "d"	
- Marking	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6
- Permissible 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 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 21, 22	
- Marking	Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc
- Permissible ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
- Permissible 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 ... 45 V, 4 ... 20 mA
• Dust explosion protection for Zones 20, 21, 22	

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Absolute pressure (pressure series)

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for absolute pressure (pressure series)	
- 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 V, I _i = 101 mA, P _i = 760 mW U _i = 29 V, I _i = 110 mA, P _i = 800 mW L _i = 0.24 µH/C _i = 3.29 nF
- Effective internal inductance/capacitance	
• 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 ... 30 V, 4 ... 20 mA No.: FM19US0155X No.: CSA18CA70163103
• Explosion protection acc. to FM	
• Explosion protection according to CSA	
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters with Analog Output Signal
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Requirements for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

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

2) Not possible for SITRANS P320 (7MF0320).

Communication	
HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
PROFINET over Ethernet APL	
Name of the station	DCP protocol (default setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PA Profile Version 4.02 Device ID 0xB310
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

Communication	
• Pressure transducer block	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve 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 mode
PROFINET IO functions	
Number of DeviceAccess AR	1
Network diagnostics	via SNMP (Simple Network Management Protocol)
System redundancy	S2
Minimum device interval	32 ms
Support of start parameters	Yes
Diagnostic features	Advanced diagnostics incl. NAMUR NE107 support
FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function blocks analog input, 1 function block PID
• Analog input	

Technical specifications (continued)

Communication	
- 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)
- Failure behavior	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	

Communication	
- 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 mode

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Absolute pressure (differential pressure series)

Selection and ordering data

Pressure transmitters for absolute pressure (differential pressure series)										Article No.									
SITRANS P320										7MF033									
SITRANS P420										7MF043									
Click the article number for online configuration in the PIA Life Cycle Portal.																			
Communication																			
HART, 4 ... 20 mA										0									
PROFIBUS PA										1									
FOUNDATION Fieldbus (FF)										2									
Profibus over Ethernet-APL										5									
Measuring cell filling																			
Silicone oil										1									
Inert filling liquid										3									
Maximum measuring span																			
250 mbar a (100.5 inH ₂ O a)										G									
1300 mbar a (522 inH ₂ O a)										L									
5000 mbar a (72.5 psi a)										P									
30 bar a (435 psi a)										R									
160 bar (2 320 psi)										Y									
Process connection																			
Oval flange, fastening thread: $\frac{7}{16}$ -20 UNF (IEC 61518)										Q									
Oval flange, fastening thread: M10 (DIN 19213)										R									
Oval flange, fastening thread: $\frac{7}{16}$ -20 UNF (IEC 61518) with lateral ventilation										S									
Oval flange, fastening thread: M10 (DIN 19213) with lateral ventilation										T									
Version for diaphragm seal with fastening thread $\frac{7}{16}$ -20 UNF (IEC 61518)										V									
Version for diaphragm seal with fastening thread M10 (DIN 19213)										W									
Material of wetted parts: Sensor body, seal diaphragm, process flange																			
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408										0									
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408										1									
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408										2									
Tantalum/tantalum, process flange stainless steel 316/1.4408										4									
Monel 400/2.4360, Monel 400/2.4360, process flange stainless steel 316/1.4408										6									
Stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408										8									
Material of non-wetted parts																			
Die-cast aluminum										1									
Stainless steel investment 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									
Intrinsic safety, 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 L (Zone model, Class Division)										T									
Electrical connections/cable entries																			
Thread for cable gland: Cable gland must be ordered separately as option (Axx)																			
• 2 × M20 × 1.5										F									
• 2 × ½-14 NPT										M									
Local operation/display																			
Without local display (lid closed)										0									
With local display (lid closed)										1									
With local display (lid with glass pane)										2									

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Absolute pressure (differential pressure series)

Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
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
Sealing plug included, plastic	A20
Sealing plug included, metal	A21
Sealing plug included, stainless steel	A22
Sealing plug included, stainless steel 316L/1.4404	A23
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	A30
Device plug Han 7D, mounted left (plastic, angled)	A31
Device plug Han 7D, mounted left (metal, straight)	A32
Device plug Han 7D, mounted left (metal, angled)	A33
Device plug Han 8D, mounted left (plastic, straight)	A34
Device plug Han 8D, mounted left (plastic, angled)	A35
Device plug Han 8D, mounted left (metal, straight)	A36
Device plug Han 8D, mounted left (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/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	A45
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	A48
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	A49
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	A90
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	A91
Cable gland/device plug mounted left	A97
Plug mounted right	A98
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

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
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
Declaration of compliance with the order EN 10204-2.1: Compliance with order	C35
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66/IP68 (not for device plug 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
Transmitter packaged in foil	D60
Cleaning the measuring cell, grease-free as per cleanliness level 2, DIN 25410; transmitter packaged in foil	D61
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packaged in foil; (particles < 50 mg/m³; oil and residual grease content HC < 100 mg/m³)	D62
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, UKCA, RCM) except EAC, FM, CSA, KC	E00
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KC	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
CSA (Japan)	E29
ECASEx (UAE)	E32
UKEX (United Kingdom)	E33
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	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

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Absolute pressure (differential pressure series)

Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
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. 160 bar (2 320 psi) at 100 °C (212 °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	
Zinc-plated steel	H01
Stainless steel 1.4301/304	H02
Stainless steel 1.4404/316L	H03
Mounting bracket, zinc-plated steel, reinforced (KTA)	H05
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	
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 chambered with gaskets	
1 × chambered, graphite	K40
1 × chambered, PTFE (FDA compliant), recommended for gas measurements	K41

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE	K50
O-ring, process flanges, FEP	K51
O-ring, process flanges, FFKM (FFPM)	K52
O-ring, process flanges, NBR	K53
O-ring, process flanges, EPDM	K54
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, measuring medium: Gas	K85
Oval flange attached, PTFE seal + fixing 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
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	Y01
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
TAG short (device parameters, max. 8 characters)	Y17
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	Y21
Local display: Scaling with standard units [m³/s, l/s, m, inch, ...]; example 1 ... 5 m	Y22
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	Y32
ID number of special design	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 / SITRANS P320/P420 / Absolute pressure (differential pressure series)

Technical specifications

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)			
Input Measured variable Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU) Measuring limits - Lower measuring limit - Measuring cell with silicone oil filling - Measuring cell with inert liquid - Upper measuring limit - Lower range value	Absolute pressure Measuring span 8.3 ... 250 mbar a 0.83 ... 25 kPa a 3.3 ... 100.5 inH ₂ O a 43 ... 1300 mbar a 4.3 ... 130 kPa a 17.3 ... 522 inH ₂ O a 166 ... 5 000 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 8 ... 160 bar 0.8 ... 16 MPa 116 ... 2 320 psi		
		Max. permissible operating pressure MAWP (PS) 160 bar a 16 MPa a 2 320 psi a 160 bar a 16 MPa a 2 320 psi a 160 bar a 16 MPa a 2 320 psi a 160 bar a 16 MPa a 2 320 psi a	Maximum permissible test pressure 240 bar a 24 MPa a 3 481 psi a 240 bar a 24 MPa a 3 481 psi a 240 bar a 24 MPa a 3 481 psi a 240 bar a 24 MPa a 3 481 psi a
		0 mbar a/kPa a/psi a	
		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
		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)	
		Between the measuring limits (infinitely adjustable)	
	Output Output signal - Lower saturation limit (infinitely adjustable) - Upper saturation limit (infinitely adjustable) - Ripple (without HART communication) Adjustable damping - Current simulator - Failure signal Load - Without HART communication - With HART communication Characteristic curve Physical bus Polarity-independent		
	HART 4 ... 20 mA 3.55 mA, factory set 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, infinitely adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over local 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 : Auxiliary power in V $R = 230 \dots 1100 \text{ } \Omega$ Linearly increasing or linearly decreasing - -		
	Measuring accuracy Reference conditions Characteristic curve deviation at limit point setting, including hysteresis and repeatability Measuring span ratio r (spread, turn-down) <u>Linear characteristic curve</u> 250 mbar/25 kPa/3.63 psi		
		• 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)	
		r = max. measuring span/set measuring span and nominal measuring range	
		r ≤ 5:	≤ 0.065% (SITRANS P320) ≤ 0.055% (SITRANS P420)
		5 < r ≤ 30:	≤ (0.01 · r + 0.05)% (SITRANS P320 and SITRANS P420)

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)		
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/16 MPa/2 320 psi	$r \leq 5$: $5 < r \leq 30$: $r \leq 5$: $5 < r \leq 20$:	$\leq 0.065\%$ (SITRANS P320) $\leq 0.055\%$ (SITRANS P420) $\leq (0.005 \cdot r + 0.05)\%$ $\leq 0.065\%$ (SITRANS P320) $\leq 0.055\%$ (SITRANS P420) $\leq (0.005 \cdot r + 0.05)\%$
<u>Effect of ambient temperature</u> (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	$\leq (0.1 \cdot r + 0.1)\%$ $\leq (0.0025 \cdot r + 0.125)\%$	
<u>Long-term stability at ± 30 °C (± 54 °F)</u>		
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 10 years $\leq (0.25 \cdot r)\%$ In 15 years $\leq (0.30 \cdot r)\%$ In 5 years $\leq (0.1 \cdot r)\%$ In 10 years $\leq (0.15 \cdot r)\%$ In 15 years $\leq (0.20 \cdot r)\%$	
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 fill oil	-40 ... +100 °C (-40 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F) -20 ... +100 °C (-4 ... +212 °F)	
Ambient conditions		
- Ambient temperature/enclosure - Measuring cell with silicone oil filling - Measuring cell with inert fill oil - Local 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		
	- Aluminum enclosure: Approx. 3.9 kg (8.5 lb) - Stainless steel enclosure: Approx. 5.9 kg (13 lb)	
Material		
- Material of wetted parts - Seal diaphragm - Process flanges - Sealing plug - O-ring - Material of non-wetted parts	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 1.4404 or as option alloy C22; 2.4602 or Monel mat. no. 2.4360 FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR	

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Absolute pressure (differential pressure series)

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)	
- Electronics enclosure - Process flange screws - Mounting bracket - Process connection - Electrical connection	• Low-copper die-cast aluminum GD-ALSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyester - Option: 2 coats: Coat 1: Epoxy-based; coat 2: Polyester • Stainless steel nameplate (1.4404/316L) Stainless steel ISO 3506-1 A4-70 Steel, zinc-plated steel, or stainless steel ¼-18 NPT internal 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 screw glands: • M20 × 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D¹⁾ • Device plug M12
Displays and controls Buttons Local display	4 buttons for operation directly on the device • With or without integrated local 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 mode $U_{SS} \leq 0.2 \text{ V}$ (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 as per ATEX • 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	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.: 24 ACC NY 265 (option E85) No.: 20180920-MH61350 (option E84) No.: 0F9863.5C (option E60) No.: GYJ24.1046X (option E27) No.: BRA 22.GE0004X (option E25) No.: BVS 18 ATEX E 049X II 1/2 G Ex ia/ib IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ µH/C}_i = 3.29 \text{ nF}$ Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To a circuit with the operating values: $U_n = 10.5 \text{ ... } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$ Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc -40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F) 120 °C (248 °F) To a circuit with the operating values: $U_n = 10.5 \text{ ... } 45 \text{ V}$, $4 \text{ ... } 20 \text{ mA}$

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for absolute pressure (differential pressure series)	
- Marking	Ex II 1D Ex ia IIC T120 °C Da Ex II 2D Ex ib IIC 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 a circuit with the operating values: $U_n = 10.5 \dots 30 \text{ V}$, $4 \dots 20 \text{ mA}$
• Explosion protection acc. to FM	No.: FM19US0155X
• Explosion protection according to CSA	No.: CSA18CA70163103
NAMUR recommendations	
• NE 06	Standardized Electrical Signals and Questions Relating to Engineering Technology
• NE 21	Electromagnetic Compatibility (EMC) of Industrial Process and Laboratory Control Equipment
• NE 23	Extra Low Voltage Circuits with Safe Separation
• NE 43	Standardization of the Signal Level for the Failure Information of Digital Transmitters with Analog Output Signal
• NE 53	Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics
• NE 80	The Application of the Pressure Equipment Directive to Process Control Devices
• NE 105	Requirements for Integrating Fieldbus Devices in Engineering Tools for Field Devices
• NE 107	Self-Monitoring and Diagnosis of Field Devices
• NE 131	NAMUR Standard Device - Field Devices for Standard Applications

¹⁾ Han 8D is identical to Han 8U.

Communication	
HART	
HART	230 ... 1 100 Ω
Protocol	HART 7
Software for computer	SIMATIC PDM
PROFINET over Ethernet APL	
Name of the station	DCP protocol (default setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PA Profile Version 4.02 Device ID 0xB310
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	

Communication	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve 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 mode
PROFINET IO functions	
Number of DeviceAccess AR	1
Network diagnostics	via SNMP (Simple Network Management Protocol)
System redundancy	S2
Minimum device interval	32 ms
Support of start parameters	Yes
Diagnostic features	Advanced diagnostics incl. NAMUR NE107 support
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

Pressure measurement

Pressure transmitters

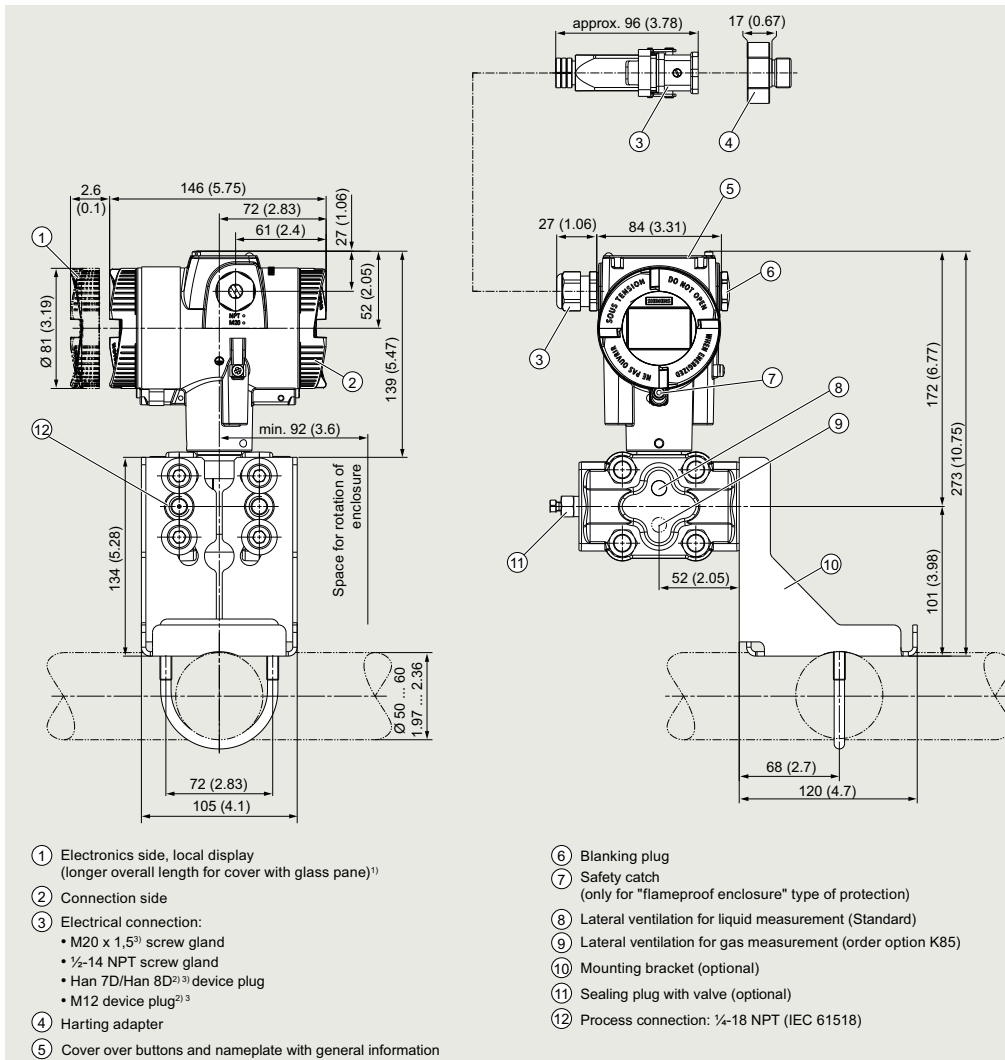
for applications with advanced requirements / SITRANS P320/P420 / Absolute pressure (differential pressure series)

Technical specifications (continued)

Communication	
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure behavior	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

Communication	
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp mode

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 + XPJ]"

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

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Differential pressure and flow

Selection and ordering data

Article No.									
Pressure transmitters for differential pressure and flow, PN 160									
(MAWP 2320 psi)									
SITRANS P320									
SITRANS P420									
Click the article number for online configuration in the PIA Life Cycle Portal.									
Communication									
HART, 4 ... 20 mA								0	
PROFIBUS PA								1	
FOUNDATION Fieldbus (FF)								2	
Profibus over Ethernet-APL								5	
Measuring cell filling									
Silicone oil								1	
Inert liquid								3	
Neobee oil								4	
Maximum measuring span									
10 mbar (4.015 inH ₂ O) ¹⁾								A	
20 mbar (8.037 inH ₂ O)								B	
60 mbar (24.11 inH ₂ O)								D	
250 mbar (100.5 inH ₂ O)								G	
600 mbar (241.1 inH ₂ O)								H	
1 600 mbar (643 inH ₂ O)								M	
5 000 mbar (2009 inH ₂ O)								P	
30 bar (435 psi)								R	
160 bar (2 320 psi)								Y	
Process connection									
Oval flange, fastening thread: ⁷ / ₁₆ -20 UNF (IEC 61518)								L	
Oval flange, fastening thread: M10 (PN 160) (DIN 19213)								M	
Oval flange, fastening thread: ⁷ / ₁₆ -20 UNF (IEC 61518) with lateral ventilation								N	
Oval flange, fastening thread: M10 (PN 160) (DIN 19213) with lateral ventilation								P	
Version for diaphragm seal with fastening thread ⁷ / ₁₆ -20 UNF (IEC 61518)								V	
Version for diaphragm seal with fastening thread M10 (PN 160) (DIN 19213)								W	
Version for diaphragm seal (one side mounted directly; other side with capillary line) with fastening thread ⁷ / ₁₆ -20 UNF (IEC 61518)								X	
Material of wetted parts: Sensor body, seal diaphragm, process flange									
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408								0	
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408								1	
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408								2	
Tantalum/tantalum, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))								4	
Monel 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))								6	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408								8	
Material of non-wetted parts									
Die-cast aluminum								1	
Stainless steel investment 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
Intrinsic safety, 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 L (Zone model, Class Division)									T

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Differential pressure and flow

Selection and ordering data (continued)

Article No.									
Pressure transmitters for differential pressure and flow, PN 160 (MAWP 2320 psi)									
SITRANS P320	7MF034	●	-	●	●	●	●	-	●
SITRANS P420	7MF044	●	-	●	●	●	●	-	●
Electrical connections/cable entries									
Thread for cable gland: Cable gland must be ordered separately as option (Axx)									
• 2 × M20 × 1.5									F
• 2 × ½-14 NPT									M
Local operation/display									
Without local display (lid closed)									0
With local display (lid closed)									1
With local display (lid with glass pane)									2

1) Only possible for SITRANS P420.

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								0	
PROFIBUS PA								1	
FOUNDATION Fieldbus (FF)								2	
Measuring cell filling									
Silicone oil								1	
Inert liquid								3	
Maximum measuring span									
250 mbar (100.5 inH ₂ O)							G		
600 mbar (241.1 inH ₂ O)							H		
1600 mbar (643 inH ₂ O)							M		
5000 mbar (2009 inH ₂ O)							P		
30 bar (435 psi)							R		
Process connection									
Oval flange, fastening thread: 7/16"-20 UNF (IEC 61518)							L		
Oval flange, fastening thread: M12 (PN 420) (DIN 19213)							M		
Oval flange, fastening thread: 7/16"-20 UNF (IEC 61518) with lateral ventilation							N		
Oval flange, fastening thread: M12 (PN 420) (DIN 19213) with lateral ventilation							P		
Version for diaphragm seal with fastening thread 7/16"-20 UNF (IEC 61518)							V		
Version for diaphragm seal (one side mounted directly; other side with capillary line) with fastening thread 7/16"-20 UNF (IEC 61518)							X		
Material of wetted parts: Sensor body, seal diaphragm, process flange									
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408								0	
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408								1	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404 gold-plated, process flange stainless steel 316/1.4408								8	
Material of non-wetted parts									
Die-cast aluminum								1	
Stainless steel investment 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

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Differential pressure and flow

Selection and ordering data (continued)

Article No.												
Pressure transmitters for differential pressure and flow, PN 420 (MAWP 6092 psi)												
SITRANS P320												
SITRANS P420												
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 L (Zone model, Class Division)											T	
Electrical connections/cable entries												
Thread for cable gland: Cable gland must be ordered separately as option (Axx)												
• 2 × M20 × 1.5											F	
• 2 × ½-14 NPT											M	
Local operation/display												
Without local display (lid closed)												0
With local display (lid closed)												1
With local display (lid with glass pane)												2

Options	Order code
Add "-Z" to article No., add order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	A00
Metal	A01
Stainless steel	A02
Stainless steel 316L/1.4404	A03
CMP, for XP devices	A10
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A11
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	A12
Sealing plug included, plastic	A20
Sealing plug included, metal	A21
Sealing plug included, stainless steel	A22
Sealing plug included, stainless steel 316L/1.4404	A23
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	A30
Device plug Han 7D, mounted left (plastic, angled)	A31
Device plug Han 7D, mounted left (metal, straight)	A32
Device plug Han 7D, mounted left (metal, angled)	A33
Device plug Han 8D, mounted left (plastic, straight)	A34
Device plug Han 8D, mounted left (plastic, angled)	A35
Device plug Han 8D, mounted left (metal, straight)	A36
Device plug Han 8D, mounted left (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/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	A45
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	A48
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	A49
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63

Options	Order code
Add "-Z" to article No., add order code and plain text or entry from drop-down list.	
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	A90
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	A91
Cable gland/device plug mounted left	A97
Plug mounted right	A98
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
Declaration of compliance with the order EN 10204-2.1: Compliance with order	C35
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66/IP68 (not for device plug M12 and Han)	D30
Unlabeled TAG plate	D40
Without labeling of the measuring range on the TAG plate	D41

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Differential pressure and flow

Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
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 media of fluid group 2 acc. to DGR. Not suitable for use with hazardous media.)	D50
Extension of the medium temperature to -40 °C for measuring cell filling with inert fill liquid Please note step response time T63: 5.5 s (20 and 60 mbar); 1.4 s (250 and 600 mbar); 0.3 s (1.6 and 5 bar)	D52
Transmitter packaged in foil	D60
Cleaning the measuring cell, grease-free as per cleanliness level 2, DIN 25410; transmitter packaged in foil	D61
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packaged in foil; (particles < 50 mg/m ² ; oil and residual grease content HC < 100 mg/m ²)	D62
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, UKCA, RCM) except EAC, FM, CSA, KC	E00
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KC	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
CSA (Japan)	E29
ECASEx (UAE)	E32
UKEX (United Kingdom)	E33
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	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	
DIBt overfill protection for liquids (non-flammable and flammable)	E61

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Oxygen application (with inert liquid, max. 160 bar (2 320 psi) at 100 °C (212 °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	
Zinc-plated steel	H01
Stainless steel 1.4301/304	H02
Stainless steel 1.4404/316L	H03
Mounting bracket, zinc-plated steel, reinforced (KTA)	H05
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	
Process flange material alloy C22/2.4602	K01
Process flange material Monel 400/2.4360	K02
Stainless steel with PVDF insert max. PN 10 (MAWP 145 psi), max. medium temperature 90 °C (194 °F) Process connection 1/2-14 NPT, on the side in the middle of the process flanges, no vent valves possible	K05
Process flanges chambered with gaskets	
1 × chambered, graphite	K40
1 × chambered, PTFE (FDA compliant), recommended for gas measurements	K41
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE (Not permitted with remote seal attachment on both sides)	K50
O-ring, process flanges, FEP (with silicone core, approved for food, FDA compliant) (Not permitted with remote seal attachment on both sides)	K51
O-ring, process flanges, FFKM (FFPM) (Not permitted with remote seal attachment on both sides)	K52
O-ring, process flanges, NBR (Not permitted with remote seal attachment on both sides)	K53
O-ring, process flanges, EPDM (Not permitted with remote seal attachment on both sides)	K54
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

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Differential pressure and flow

Selection and ordering data (continued)

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
Valve 1/4-18 NPT, material same as process flanges	K84
Valve mounted on the side, measuring medium: Gas	K85
Oval flange attached, PTFE seal + fixing 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
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	Y01
Square-rooted characteristic curve [VSLN2, MSLN2]; example: VSLN2	Y02

Options Add "-Z" to article No., add order code and plain text or entry from drop-down list.	Order code
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
TAG short (device parameters, max. 8 characters)	Y17
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	Y21
Local display: Scaling with standard units [m³/s, l/s, m, inch, ...], example 1 ... 5 m³/s	Y22
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	Y32
ID number of special design	Y99

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

Technical specifications

SITRANS P320 / SITRANS P420 for differential pressure and flow				
Input	Differential pressure and flow			
Measured variable	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure	
Measuring span (infinitely adjustable) or measuring range and max. permissible operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	0.25 ... 10 mbar	160 bar	240 bar	
	0.025 ... 1 kPa	16 MPa	24 MPa	
	0.1003 ... 4.015 inH ₂ O	2320 psi	3481 psi	
	1 ... 20 mbar	160 bar	240 bar	
	0.1 ... 2 kPa	16 MPa	24 MPa	
	0.4019 ... 8.037 inH ₂ O	2 320 psi	3 481 psi	
	1 ... 60 mbar	160 bar	240 bar	
	0.1 ... 6 kPa	16 MPa	24 MPa	
	0.4019 ... 24.11 inH ₂ O	2 320 psi	3 481 psi	
	2.5 ... 250 mbar	160 bar	240 bar	
	0.2 ... 25 kPa	16 MPa	24 MPa	
	1.005 ... 100.5 inH ₂ O	2 320 psi	3 481 psi	
	6 ... 600 mbar	160 bar	240 bar	
	0.6 ... 60 kPa	16 MPa	24 MPa	
	2.41 ... 241.1 inH ₂ O	2 320 psi	3 481 psi	
	16 ... 1600 mbar	160 bar	240 bar	
	1.6 ... 160 kPa	16 MPa	24 MPa	
	6.43 ... 643 inH ₂ O	2 320 psi	3 481 psi	
	50 ... 5 000 mbar	160 bar	240 bar	
	5 ... 500 kPa	16 MPa	24 MPa	
	20.09 ... 2009 inH ₂ O	2 320 psi	3 481 psi	
	0.3 ... 30 bar	160 bar	240 bar	
	0.03 ... 3 MPa	16 MPa	24 MPa	
	4.35 ... 435 psi	2 320 psi	3 481 psi	
	8 ... 160 bar	160 bar	240 bar	
	0.8 ... 16 MPa	16 MPa	24 MPa	
	116 ... 2 320 psi	2 320 psi	3 481 psi	
	2.5 ... 250 mbar	420 bar	630 bar	
	0.25 ... 25 kPa	42 MPa	63 MPa	
	1.005 ... 100.5 inH ₂ O	6 092 psi	9 137 psi	
	6 ... 600 mbar	420 bar	630 bar	
	0.6 ... 60 kPa	42 MPa	63 MPa	
	2.41 ... 241.1 inH ₂ O	6 092 psi	9 137 psi	
	16 ... 1600 mbar	420 bar	630 bar	
	1.6 ... 160 kPa	42 MPa	63 MPa	
	6.43 ... 643 inH ₂ O	6 092 psi	9 137 psi	
	50 ... 5 000 mbar	420 bar	630 bar	
	5 ... 500 kPa	42 MPa	63 MPa	
	20.09 ... 2009 inH ₂ O	6 092 psi	9 137 psi	
	0.3 ... 30 bar	420 bar	630 bar	
	0.03 ... 3 MPa	42 MPa	63 MPa	
	4.35 ... 435 psi	6 092 psi	9 137 psi	
	Measuring limits	All measuring cells:		
	• Lower measuring limit	• -100% of max. measuring range or 30 mbar a /3 kPa a /0.44 psi a		
	- Measuring cell with silicone oil filling	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)		
		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			
	-100% of the maximum measuring range, or			
	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 fill 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)			

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Differential pressure and flow

Technical specifications (continued)

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 simulator - Failure signal Load - Without HART communication - With HART communication Characteristic curve Physical bus Polarity-independent	HART 4 ... 20 mA 3.55 mA, factory set 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, infinitely adjustable over remote operation 0 ... 100 s, in increments of 0.1 s, adjustable over local 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 : Auxiliary power in V $R = 230 \dots 1100 \Omega$ - 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) Characteristic curve deviation at limit point setting, including hysteresis and repeatability Measuring span ratio r (spread, turn-down) <u>Linear characteristic curve</u> 10 mbar/1 kPa/0.145 psi 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 420) <u>Square-rooted characteristic curve (flow > 50%)</u> 10 mbar/1 kPa/0.145 psi 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 ≤ 2: 2 < r ≤ 40: r ≤ 1.5: 1.5 < r ≤ 20: r ≤ 2: 2 < r ≤ 60: r ≤ 2: 2 < r ≤ 100: r ≤ 5: 5 < r ≤ 100: r ≤ 5: 5 < r ≤ 20: r ≤ 2: 2 < r ≤ 100:	≤ 0.065% (SITRANS P420) ≤ (0.01 · r + 0.05)% (SITRANS P420) ≤ 0.055% (SITRANS P320) ≤ 0.05% (SITRANS P420) ≤ (0.005 · r + 0.05)% ≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420) ≤ (0.005 · r + 0.05)% ≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420) ≤ (0.005 · r + 0.05)% (SITRANS P320 / SITRANS P420) ≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420) ≤ (0.004 · r + 0.045)% (SITRANS P320 / SITRANS P420) ≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420) ≤ (0.004 · r + 0.045)% (SITRANS P320 / SITRANS P420) ≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420) ≤ (0.005 · r + 0.05)% ≤ 0.065% ≤ (0.01 · r + 0.05)% ≤ 0.075% ≤ (0.005 · r + 0.05)% ≤ 0.075% ≤ (0.005 · r + 0.05)% ≤ 0.065% (SITRANS P320) ≤ 0.04% (SITRANS P420) ≤ (0.004 · r + 0.045)% ≤ 0.055% (SITRANS P320) ≤ 0.04% (SITRANS P420)

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for differential pressure and flow

• 160 bar/16 MPa/2 320 psi	$5 < r \leq 20$:	$\leq (0.004 \cdot r + 0.045)\%$
<u>Square-rooted characteristic curve (flow 25 ... 50%)</u>		
• 10 mbar/1 kPa/0.145 psi	$r \leq 2$:	$\leq 0.13\%$
	$2 < r \leq 40$:	$\leq (0.02 \cdot r + 0.1)\%$
• 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	$5 < r \leq 100$:	$\leq (0.008 \cdot r + 0.09)\%$
5 bar/500 kPa/72.5 psi		
30 bar/3 MPa/435 psi		
• 160 bar/16 MPa/2 320 psi	$r \leq 5$:	$\leq 0.11\%$ (SITRANS P320)
		$\leq 0.08\%$ (SITRANS P420)
	$5 < r \leq 20$:	$\leq (0.008 \cdot r + 0.09)\%$

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

• 10 mbar/2 kPa/0.145 psi	$\leq (0.3 \cdot r + 0.1)\%$
• 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 offset is possible with position error compensation
- 10 mbar/1 kPa/0.145 psi	$\leq (0.4 \cdot r)\%$ per 70 bar
- 20 mbar/2 kPa/0.29 psi	$\leq (0.3 \cdot r)\%$ per 70 bar (SITRANS P320)
	$\leq (0.2 \cdot r)\%$ per 70 bar (SITRANS P420)
- 60 mbar/6 kPa/0.87 psi	$\leq (0.1 \cdot r)\%$ per 70 bar
250 mbar/25 kPa/3.63 psi	
600 mbar/60 kPa/8.7 psi	
1600 mbar/160 kPa/23.21 psi	
30 bar/3 MPa/435 psi	
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 (for PN160)	
- 10 mbar/1 kPa/0.145 psi	$\leq 0.4\%$ per 70 bar
- 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	
• On the measuring span (for PN420)	
- 250 mbar/25 kPa/3.63 psi	$\leq (0.14 \cdot r)\%$ per 70 bar
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) Static pressure max. 70 bar/7 MPa/1015 psi

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Differential pressure and flow

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for differential pressure and flow	
• 10 mbar/1 kPa/0.145 psi • 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 Step response time T_{63} (without electrical damping for pressure rating PN 160) • 10 mbar/1 kPa/0.145 psi • 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 Effect of mounting position (in pressure per change of angle) Effect of auxiliary power (in % per voltage change)	In 5 years $\leq (0.3 \cdot r)\%$ In 10 years $\leq (0.5 \cdot r)\%$ In 15 years $\leq (0.7 \cdot r)\%$ In 5 years $\leq (0.15 \cdot r)\%$ In 10 years $\leq (0.25 \cdot r)\%$ In 15 years $\leq (0.35 \cdot r)\%$ In 5 years $\leq (0.15 \cdot r)\%$ In 10 years $\leq (0.25 \cdot r)\%$ In 15 years $\leq (0.35 \cdot r)\%$ In 5 years $\leq (0.05 \cdot r)\%$ In 10 years $\leq (0.1 \cdot r)\%$ In 15 years $\leq (0.15 \cdot r)\%$ Approx. 0.160 s Approx. 0.160 s Approx. 0.150 s Approx. 0.135 s ≤ 0.7 mbar/0.07 kPa/0.028 inH₂O 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 fill oil • Measuring cell with FDA compliant fill oil Ambient conditions • Ambient temperature/enclosure - Measuring cell with silicone oil filling - Measuring cell with inert fill oil - Measuring cell with FDA compliant fill oil - Local 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	-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) 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 fill oil: -20 ... +85 °C (-4 ... +185 °F)) 4K4H IP66, IP68 Type 4X According to IEC 61326 and NAMUR NE 21
Structural design Weight Material • Material of wetted parts - Seal diaphragm - Process flanges - Sealing plug - O-ring • Material of non-wetted parts	• Aluminum enclosure: Approx. 3.9 kg (8.5 lb) • Stainless steel enclosure: Approx. 5.9 kg (13 lb) 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 1.4404 or as option alloy C22; 2.4602 or Monel mat. no. 2.4360 FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for differential pressure and flow	
- Electronics enclosure - Process flange screws - Mounting bracket - Process connection - Electrical connection	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyester - Option: 2 coats: Coat 1: Epoxy-based; coat 2: Polyester • Stainless steel nameplate (1.4404/316L) Stainless steel ISO 3506-1 A4-70 Steel, zinc-plated steel, or stainless steel 1/4-18 NPT internal 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)) Screw terminals Cable entry via the following screw glands: • M20 × 1.5 • 1/2-14 NPT • Device plug Han 7D/Han 8D¹⁾ • Device plug M12
Displays and controls Buttons Local display	4 buttons for operation directly on the device • With or without integrated local 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 mode $U_{SS} \leq 0.2 \text{ V}$ (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 as per ATEX • 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	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.: 24 ACC NY 265 (option E85) No.: 20180920-MH61350 (option E84) No.: 0F9863.5C (option E60) No.: GYJ24.1046X (option E27) No.: BRA 22.GE0004X (option E25) No.: BVS 18 ATEX E 049X II 1/2 G Ex ia/Ib IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +55 °C (-40 ... +131 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To certified intrinsically safe circuits with peak values: $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$ $L_i = 0.24 \text{ } \mu\text{H/C}_i = 3.29 \text{ nF}$ Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To a circuit with the operating values: $U_n = 10.5 \dots 45 \text{ V}$, $4 \dots 20 \text{ mA}$ 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: $U_n = 10.5 \dots 45 \text{ V}$, $4 \dots 20 \text{ mA}$

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Differential pressure and flow

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for differential pressure and flow	
- 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 - Explosion protection according to CSA - NAMUR recommendations - NE 06 - NE 21 - NE 23 - NE 43 - NE 53 - NE 80 - NE 105 - NE 107 - NE 131	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 a circuit with the operating values: $U_n = 10.5 \dots 30 \text{ V}$, $4 \dots 20 \text{ mA}$ No.: FM19US0155X No.: CSA18CA70163103 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 with Analog Output Signal Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics The Application of the Pressure Equipment Directive to Process Control Devices Requirements 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
PROFINET over Ethernet APL	
Name of the station	DCP protocol (default setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PA Profile Version 4.02 Device ID 0xB310
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	

Communication	
- Can be calibrated by applying two pressures	Yes
- Monitoring of sensor limits	Yes
- Specification of a vessel characteristic curve 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 mode
PROFINET IO functions	
Number of DeviceAccess AR	1
Network diagnostics	via SNMP (Simple Network Management Protocol)
System redundancy	S2
Minimum device interval	32 ms
Support of start parameters	Yes
Diagnostic features	Advanced diagnostics incl. NAMUR NE107 support
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

Technical specifications (continued)

Communication	
- Electrical damping adjustable	0 ... 100 s
- Simulation function	Output/input (can be locked within the device with a bridge)
- Failure behavior	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

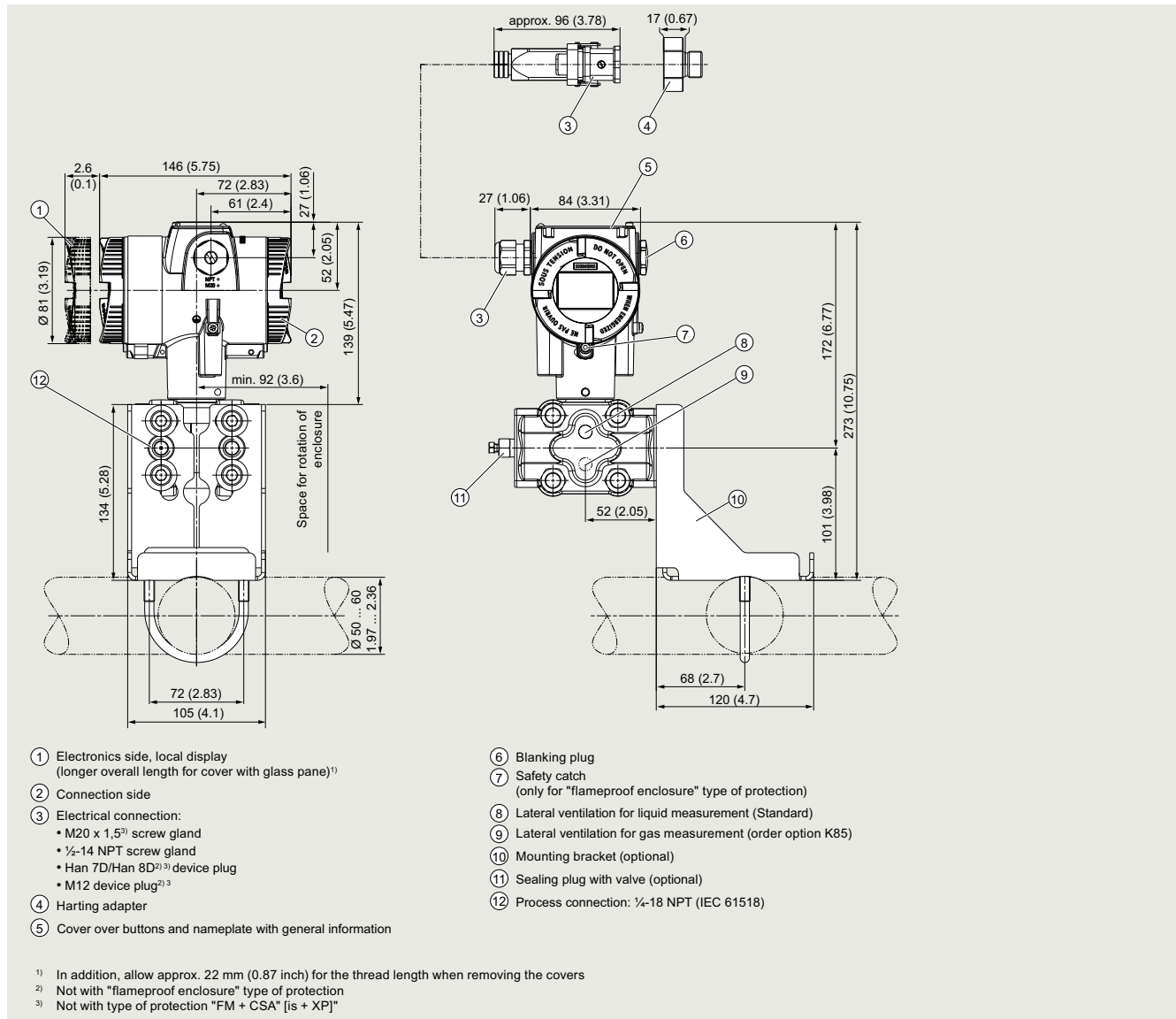
Communication	
- Simulation function: pressure measurement, sensor temperature and electronics temperature	Constant value or by means of parameterizable ramp mode

Pressure measurement

Pressure transmitters

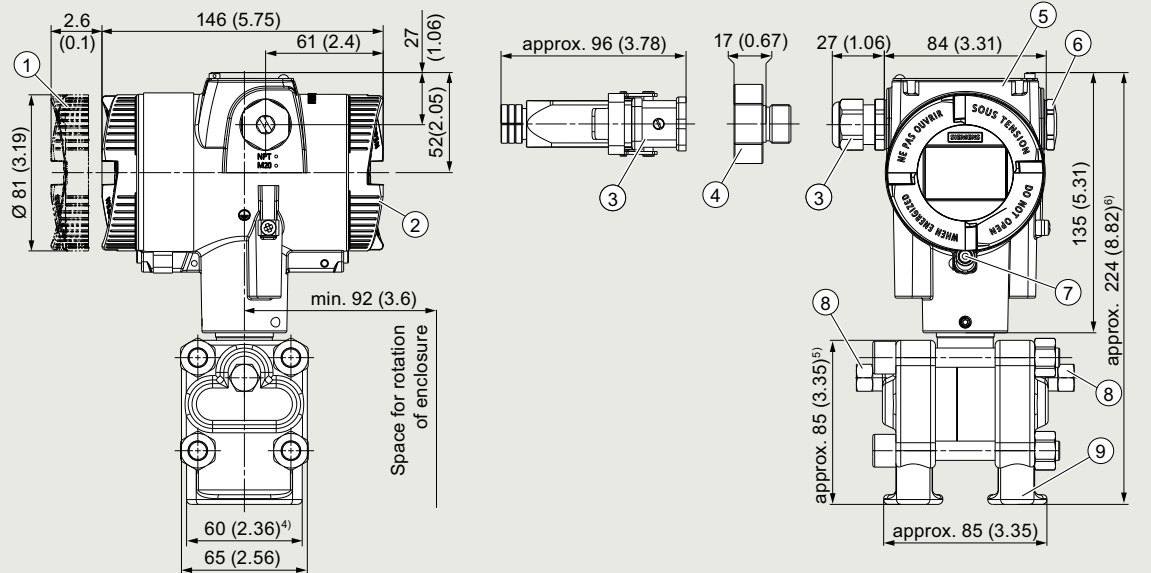
for applications with advanced requirements / SITRANS P320/P420 / Differential pressure and flow

Dimensional drawings



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

Dimensional drawings (continued)



- 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 8D^{2) 3)} device plug
 - M12 device plug^{2) 3)}
- ④ Harting adapter

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

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

²⁾ Not with "flameproof enclosure" type of protection

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

⁴⁾ 74 mm (2.9 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 / SITRANS P320/P420 / Level

Selection and ordering data

Article No.									
Pressure transmitters for level									
SITRANS P320									
SITRANS P420									
Click the article number for online configuration in the PIA Life Cycle Portal.									
Communication									
HART, 4 ... 20 mA									
PROFIBUS PA									
FOUNDATION Fieldbus (FF)									
Profibus over Ethernet-APL									
Measuring cell filling									
Silicone oil									
Inert liquid									
Maximum measuring span									
60 mbar (24.11 inH ₂ O)									
250 mbar (100.5 inH ₂ O)									
600 mbar (241 inH ₂ O)									
1600 mbar (643 inH ₂ O)									
5000 mbar (72.5 psi)									
30 bar (435 psi)									
160 bar (2321 psi)									
Process connection									
Version for diaphragm seal with fastening thread 7/16-20 UNF (IEC 61518): Remote seal 7MF0814 must be ordered separately.									
Version for diaphragm seal with fastening thread M10 (DIN 19213): The remote seal must be ordered separately. System delivery time: Delivery time of the transmitter included in the delivery time of the remote seal.									
Material of wetted parts: Sensor body, seal diaphragm, process flange									
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									
Sensor pressure: Alloy C22/2.4602, alloy C276/2.4819									
Sensor differential pressure: Alloy C276/2.4819, 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 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 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 60 mbar (0.87 psi))									
Material of non-wetted parts									
Die-cast aluminum									
Stainless steel investment 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									
Intrinsic safety, 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 L (Zone model, Class Division)									
Electrical connections/cable entries									
Thread for cable gland: Cable gland must be ordered separately as option (Axx)									
• 2 × M20 × 1.5									
• 2 × ½-14 NPT									
Local operation/display									
Without local display (lid closed)									
With local display (lid closed)									

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Level

Selection and ordering data (continued)

Pressure transmitters for level SITRANS P320 SITRANS P420	Article No.	
	7MF036	● - ● ● ● ● ● - ● ● ● ●
	7MF046	● - ● ● ● ● ● - ● ● ● ●
With local display (lid with glass pane)		2

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
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
Sealing plug included, plastic	A20
Sealing plug included, metal	A21
Sealing plug included, stainless steel	A22
Sealing plug included, stainless steel 316L/1.4404	A23
Device plug Han mounted left	
Device plug Han 7D, mounted left (plastic, straight)	A30
Device plug Han 7D, mounted left (plastic, angled)	A31
Device plug Han 7D, mounted left (metal, straight)	A32
Device plug Han 7D, mounted left (metal, angled)	A33
Device plug Han 8D, mounted left (plastic, straight)	A34
Device plug Han 8D, mounted left (plastic, angled)	A35
Device plug Han 8D, mounted left (metal, straight)	A36
Device plug Han 8D, mounted left (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/cable socket, EMC version	
Han 7D plug, mounted left, metal, EMC version (angled for p, straight for dp)	A45
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 9 ... 13 mm, core cross-section 0.5 mm², with Jacob cable entry (straight for p, angled for dp)	A48
Cable socket included, metal, EMC version, for Han 7D plug EMC, cable Ø 7.5 ... 9 mm, core cross-section 0.5 mm², with Lapp cable entry (straight for p, angled for dp)	A49
Device plug M12 mounted left	
Stainless steel, without cable socket	A62
Stainless steel, with cable socket	A63
Cable entry/device plug mounting	
2× sealing plugs M20 × 1.5, IP66/68 installed on both sides (no explosion protection approval)	A90
2× sealing plugs ½-14 NPT, IP66/68 installed on both sides (no explosion protection approval)	A91
Cable gland/device plug mounted left	A97
Plug mounted right	A98
Cable gland/device plug mounted right	A99
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	B11
French (bar)	B12
Spanish (bar)	B13

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
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
Declaration of compliance with the order EN 10204-2.1: Compliance with order	C35
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	C20
Device options	
Double layer coating (epoxy resin and polyester) 120 µm of enclosure and lid	D20
FVMQ enclosure sealing	D21
Degree of protection IP66/IP68 (not for device plug 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
Cleaning the measuring cell, grease-free (for oxygen version) and transmitter packaged in foil; (particles < 50 mg/m²; oil and residual grease content HC < 100 mg/m²)	D62
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, UKCA, RCM) except EAC, FM, CSA, KC	E00
Worldwide (CE, UKCA, RCM, EAC, FM, CSA, KC)	E01
CSA (USA and Canada)	E06
EAC	E07
FM	E08
KC	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

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Level

Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
PESO (India)	E28
CSA (Japan)	E29
ECASEx (UAE)	E32
UKEX (United Kingdom)	E33
ATEX (Europe), IECEx (Worldwide) and UKEX (UK)	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	
DIBt overfill protection for liquids (non-flammable and flammable)	E61
Oxygen application (with inert liquid, max. 160 bar (2 320 psi) at 100 °C (212 °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

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
Process flanges	
Gasket process flange 1 × chambered, graphite	K40
Gasket process flange, 1 × chambered, PTFE	K41
Vent valve in the material of the process flange	K84
Device settings	
Measuring span: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi	Y01
TAG (on stainless steel plate and device parameters, max. 32 characters)	Y15
Measuring point description (on stainless steel plate and device parameters, max. 32 characters)	Y16
TAG short (device parameters, max. 8 characters)	Y17
Local display: [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge	Y21
Local display: Scaling with standard units [m³/s, l/s, m, inch, ...]; example 1 ... 5 m	Y22
Local display: Scaling with user-specific units (max. 12 characters), example 1 ... 5 m	Y23
Set PROFIBUS PA device address (1 ... 126)	Y25
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA	Y30
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA]	Y31
Damping in seconds instead of 2 s (0.0 ... 100.0 s)	Y32
ID number of special design	Y99

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

Diaphragm seal 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		Article No. 7MF0814-		Order code	
Click the article number for online configuration in the PIA Life Cycle Portal.		●	●	●	●
Standard of process connection EN 1092-1		0	3	-	0
Nominal diameter		0	B	D	
DN 25	Rated pressure	0	B	F	
	PN 10/16/25/40	0	B	G	
	PN 63/100	0	B	H	
	PN 160	0	B	D	
DN 40	PN 250	0	D	D	
	PN 10/16/25/40	0	D	F	
	PN 63/100	0	D	G	
	PN 160	0	D	D	
DN 50	PN 10/16/25/40	0	E	D	
	PN 63	0	E	E	
	PN 100	0	E	F	
	PN 10/16/25/40	0	G	D	
DN 80	PN 100	0	G	F	
	PN 10/16	0	H	B	
	PN 25/40	0	H	D	
	PN 16	0	J	B	
DN 100	PN 40	0	J	D	
DN 125					

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Level

Selection and ordering data (continued)

Diaphragm seal 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		Article No. 7MF0814-				Order code						
Process connection standard ASME B16.5		●	●	●	0	3	-	0	●	●	●	●
Nominal diameter	Rated pressure											
1 inch	Class 150	1	K	L								
	Class 300	1	K	M								
	Class 600	1	K	N								
	Class 1500	1	K	P								
1½ inches	Class 150	1	L	A								
	Class 300	1	L	B								
	Class 400/600	1	L	D								
	Class 900/1500	1	L	F								
2 inches	Class 150	1	M	A								
	Class 300	1	M	B								
	Class 400/600	1	M	D								
	Class 900/1500	1	M	F								
3 inches	Class 150	1	P	A								
	Class 300	1	P	B								
	Class 600	1	P	D								
	Class 1500	1	P	F								
4 inches	Class 150	1	Q	A								
	Class 300	1	Q	B								
	Class 400	1	Q	D								
	Class 1500	1	Q	F								
5 inches	Class 150	1	R	A								
	Class 300	1	R	B								
	Class 400	1	R	C								
Process connection standard J.I.S.												
Nominal diameter	Rated pressure											
DN 50	10K	2	E	S								
	20k	2	E	T								
	40K	2	E	U								
DN 80	10K	2	G	S								
	20k	2	G	T								
	40K	2	G	U								
DN 100	10K	2	H	S								
	20k	2	H	T								
	40K	2	H	U								
Other version, add order code and plain text		9	A	A							H	1 Y
Fill liquid												
Silicone oil M50									B			
High-temperature oil									C			
Silicone oil M5									A			
Food oil (FDA-listed)									E			
Neobee M20 (FDA-listed)									R			
Halocarbon oil									D			
Other version, add order code and plain text									Z		P	1 Y
Material of wetted parts												
Stainless steel 316L												
• Without coating									A			
• With PFA coating									D			

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Level

Selection and ordering data (continued)

Diaphragm seal 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		Article No. 7MF0814-				Order code			
• With PTFE coating		●	●	●	0	3	-	0	● ● ● ● ● ● ● ●
• With ECTFE coating									
Monel 400, 2.4360									E 0
Hastelloy C276, 2.4819									F
Tantalum									G
Titanium, 3.7035									J
Nickel 201									K
Diaphragm Duplex, 1.4462									L 0
Diaphragm and flange Duplex, 1.4462									M 0
Stainless steel 316L, gold-plated									Q
Hastelloy C4, 2.4610									R
Hastelloy C22, 2.4602									S 0
Other version, add order code and plain text									U 0
									V 0
									Z
									Q 1 Y
Tube length									
None									0
50 mm (2 inches)									1
100 mm (4 inches)									2
150 mm (6 inches)									3
200 mm (8 inches)									4
250 mm (10 inches)									5
Other version, add order code and plain text									Z 8
									R 1 Y
Customer-specific tube length									
• Wetted parts: Stainless steel without coating									
Range	Standard length								
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)								A 1
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)								A 2
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)								A 3
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)								A 4
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)								A 5
• Wetted parts: Stainless steel with ECTFE coating									
Range	Standard length								
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)								F 1
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)								F 2
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)								F 3
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)								F 4
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)								F 5
• Wetted parts: Stainless steel with PFA coating									
Range	Standard length								
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)								D 1
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)								D 2
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)								D 3
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)								D 4
201 ... 250 mm (7.91 ... 9.84 inches)	250 mm (9.84 inches)								D 5
• Wetted parts: Monel 400									
Range	Standard length								
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)								G 1
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)								G 2
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)								G 3
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)								G 4
• Wetted parts: Hastelloy C276									

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Level

Selection and ordering data (continued)

Diaphragm seal 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		Article No. 7MF0814-										Order code			
Range	Standard length	●	●	●	0	3	-	0	●	●	●	●	●	●	●
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)											J	1		
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)											J	2		
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)											J	3		
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)											J	4		
• Wetted parts: Tantalum															
Range	Standard length														
20 ... 50 mm (0.79 ... 1.97 inches)	50 mm (1.97 inches)											K	1		
51 ... 100 mm (2.01 ... 3.94 inches)	100 mm (3.94 inches)											K	2		
101 ... 150 mm (3.98 ... 5.91 inches)	150 mm (5.91 inches)											K	3		
151 ... 200 mm (5.94 ... 7.87 inches)	200 mm (7.87 inches)											K	4		

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
Factory certificates	
Quality inspection certificate (5-point characteristic curve test) according to IEC 62828-2	C11
Inspection certificate according to EN 10204-3.1 for main body and diaphragm	C12
Manufacturer code according to NACE (MR 0103-2012 and MR 0175-2009) (only in combination with wetted parts made of stainless steel 316 L and Hastelloy)	C13
Inspection certificate according to EN 10204-3.1, PMI test of pressure containing and wetted parts	C15
Inspection certificate (EN 10204-3.1) - pressure test	C16
Certificate on the FDA listing of the fill oil according to EN 10204-2.2	C17
Factory certificate functional safety (SIL2/3), suitability of devices for use according to IEC 61508 and IEC 61511 (contains SIL Declaration of Conformity)	C20
Accessories	
Epoxy resin coating Color: Transparent Scope: Front and rear of the remote seal, connecting pipe, process connection of the transmitter. Maximum medium temperature with epoxy lacquering: 140 °C	D15
Remote seal nameplate Attached, made of stainless steel, contains Article No. and order number of the remote seal	D42
Volume deflagration flame arrester (VDFA) for differential pressure transmitter	D62
Negative pressure service	
Negative pressure service for differential pressure transmitters	D83
Extended negative pressure service for differential pressure transmitters	D88
Approvals and certificates	
Country-specific approval CRN approval Canada (Canadian Registration Number) Note: If the order code E60 is selected, the option E60 must also be selected for the transmitter!	E60
Oil-free and grease-free cleaned version for oxygen application including EN 10204-2.2 certificates (only with fill liquid halocarbon oil and at max. temperature 60 °C and max. pressure 50 bar)	E80
Oil-free and grease-free cleaned version not for oxygen application, including EN 10204-2.2 certificates	E87
Sealing surface	
Sealing surface smooth, form B2/EN1092-1 or RFSF/ANSI 16.5 (only for wetted parts made of stainless steel 316L)	M50
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

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
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
Sealing surface with tongue to EN 1092-1, form C (for wetted parts made of stainless steel 316L only)	
• DN 40	M71
• DN 50	M72
• DN 80	M73
• DN 100	M74
• DN 125	M75
Sealing surface with spigot according to EN 1092-1, form E (for wetted parts made of stainless steel 316L only)	
• DN 40	M77
• DN 50	M78
• DN 80	M79
• DN 100	M80
• DN 125	M81
Sealing surface internal face according to EN 1092-1, form F (only for wetted parts made of stainless steel 316L)	
• DN 50	M84
• DN 80	M85
• DN 100	M86
• DN 125	M87
Remote seal connection	
Elongated pipe, approx. 150 mm (5.9 inches)	S05
Elongated pipe, approx. 200 mm (7.9 inches)	S06
Desired remote seal supplier 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.	
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	

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Level

Selection and ordering data (continued)

Options Add "-Z" to article number, specify order code and plain text or entry from drop-down list.	Order code
• -10 ... +50 °C (14 ... +122 °F) preset	D66
• -40 ... +50 °C (-40 ... +122 °F)	D67
• -10 ... +85 °C (14 ... +185 °F)	D68
Process temperature min. ... °C/(°F)/max. ... °C/(°F)	Y50
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	D69+Y51

¹⁾ See also "Specification of process conditions for selection and ordering data" below the "More information" section.

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / 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) See "Mounting flange"	Maximum permissible test pressure
	25 ... 60 mbar 2.5 ... 6 kPa 10 ... 24.1 inH ₂ O 25 ... 250 mbar 2.5 ... 25 kPa 10 ... 100.5 inH ₂ O 25 ... 600 mbar 2.5 ... 60 kPa 10 ... 241 inH ₂ O 53 ... 1 600 mbar 5.3 ... 160 kPa 21 ... 643 inH ₂ O 166 ... 5 000 mbar 16.6 ... 500 kPa 2.41 ... 72.5 psi 1 ... 30 bar 0.1 ... 3 MPa 14.5 ... 435 psi 8 ... 160 bar 0.8 ... 16 MPa 116 ... 2320 psi		
Measuring limits			
• Lower measuring limit			
- Measuring cell with silicone oil filling	-100% of max. measuring range or 30 mbar a/3 kPa a/0.44 psi a depending on the mounting flange		
- Measuring cell with silicone oil filling (30 bar)	-30 bar/ -3 MPa/ -435 psi		
- Measuring cell with silicone oil filling (160 bar)	-40 bar/-4 MPa/-580 psi		
• Upper measuring limit	100% of max. measuring span		
• Lower range value	Between the measuring limits (infinitely adjustable)		
Output		HART	
Output signal	4 ... 20 mA		
• Lower saturation limit (infinitely adjustable)	3.55 mA, factory set 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, infinitely adjustable over remote operation		
	0 ... 100 s, in increments of 0.1 s, adjustable over local display		
• Current simulator	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 : Auxiliary power in V		
• With HART communication	$R = 230 \dots 1100 \Omega$		
Characteristic curve	• Linearly increasing or linearly decreasing		
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)		
Characteristic curve deviation at limit point setting, including hysteresis and repeatability			
Measuring span ratio r (spread, turn-down)	$r = \text{maximum measuring span/set measuring span or nominal measuring range}$		
Linear characteristic curve	$r \leq 2.4$	$r \leq 5$	$5 < r \leq 10$
• 60 mbar/6 kPa/0.87 psi	$\leq 0.125\%$		
• 250 mbar/25 kPa/3.6 psi		$\leq 0.125\%$	$\leq (0.007 \cdot r + 0.09) \%$
• 600 mbar/60 kPa/8.7 psi			
• 1600 mbar/160 kPa/23.21 psi			
• 5 bar/500 kPa/72.5 psi			

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Level

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for level	
• 30 bar/3 MPa/435.11 psi • 160 bar/16 MPa/2320 psi	
Effect of ambient temperature (in % per 28 °C (50 °F))	
SITRANS P320	
• 60 mbar/6 kPa/0.87 psi • 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 • 30 bar/3 MPa/435.11 psi • 160 bar/16 MPa/2320 psi	$\leq (0.075 \cdot r + 0.1)\%$ $\leq (0.025 \cdot r + 0.125)\%$
SITRANS P420	
• 60 mbar/6 kPa/0.87 psi • 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 • 30 bar/3 MPa/435.11 psi • 160 bar/16 MPa/2320 psi	$\leq (0.075 \cdot r + 0.1)\%$ $\leq (0.025 \cdot r + 0.0625)\%$ $\leq (0.0125 \cdot r + 0.0625) \%$
Effect of static pressure	
• At the lower range value • 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/72.52 psi • 30 bar/3 MPa/435.11 psi • 160 bar/16 MPa/2320 psi	$\leq (0.4 \cdot r)\%$ per rated pressure $\leq (0.3 \cdot r)\%$ per rated pressure $\leq (0.15 \cdot r)\%$ per rated pressure
• On the measuring span	$\leq (0.1 \cdot r)\%$ per rated pressure
Long-term stability at ± 30 °C (± 54 °F)	
• All measuring cells	In 5 years $\leq (0.15 \cdot r)\%$ In 10 years $\leq (0.25 \cdot r)\%$ In 15 years $\leq (0.35 \cdot r)\%$ Static pressure max. 70 bar/7 MPa/1015 psi
Step response time T_{63} (without electrical damping)	Depends on the installed remote seal
Influence of mounting position	Depends on the fill liquid in the mounting flange
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 fill oil	• High side: See "Mounting flange" • Low side: -40 ... +100 °C (-40 ... +212 °F)
Ambient conditions	
• Ambient temperature/enclosure	Always consider the assignment of max. permissible operating temperature to max. permissible operating pressure of the respective flange connection.
- Measuring cell with silicone oil filling - Measuring cell with inert fill oil - Local display	-40 ... +85 °C (-40 ... +185 °F) -40 ... +85 °C (-40 ... +185 °F) -20 ... +80 °C (-4 ... +176 °F)
• Storage temperature • Climatic class in accordance with IEC 60721-3-4	-50 ... +85 °C (-58 ... +185 °F) 4K4H
• Degree of protection	IP66, IP68
- According to IEC 60529 - As per NEMA 250	Type 4X
• Electromagnetic compatibility - Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Structural design	
Weight	Pressure transmitter with mounting flange, without tube
• According to EN	• Aluminum enclosure: Approx. 11 ... 13 kg (24.2 ... 28.7 lb) • Stainless steel enclosure: Approx. 13 ... 15 kg (28.7 ... 33 lb)
• According to ASME	• Aluminum enclosure: Approx. 11 ... 18 kg (24.2 ... 39.7 lb) • Stainless steel enclosure: Approx. 13 ... 20 kg (28.7 ... 44 lb)
Material	

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for level			
• Material of wetted parts - High side - Gasket material in the process flanges - Low side • Material of non-wetted parts - Electronics enclosure - Process flange screws - Measuring cell filling • Mounting flange fill liquid - Process connection • High side • Low side - Electrical connection	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 polyester		
• Option: 2 coats: Coat 1: Epoxy-based; coat 2: Polyester			
• Stainless steel nameplate (1.4404/316L)			
Stainless steel ISO 3506-1 A4-70			
Silicone oil			
Silicone oil or other material			
Flange according to EN, ASME, and JIS			
Internal thread 1/4-18 NPT and flange connection with fastening thread M10 as per DIN 19213 or 7/16-20 UNF as per EN 61518			
Screw terminals			
Cable entry via the following screw glands:			
• M20 × 1.5			
• 1/2-14 NPT			
• Device plug Han 7D/Han 8D ¹⁾			
• Device plug M12			
Displays and controls			
Buttons	4 buttons for operation directly on the device		
Local display	• With or without integrated local 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 mode		
Ripple	U _{SS} ≤ 0.2 V (47 ... 125 Hz)		
Noise	U _{eff} ≤ 1.2 mV (0.5 ... 10 kHz)		
Auxiliary power	–		
Separate supply voltage	–		
Certificates and approvals			
Classification according to pressure equipment directive (PED 2014/68/EU)	For gases of fluid group 1 and liquids of fluid group 1; complies with requirements of article 4, paragraph 3 (sound engineering practice)		
Drinking water			
• WRAS (England)	No.: 1903094 (option E83)		
• NSF (USA)	No.: 20180920-MH61350 (option E84)		
CRN (Canada)	No.: 0F9863.5C (option E60)		
Explosion protection acc. to NEPSI (China)	No.: GYJ24.1046X (option E27)		
Explosion protection acc. to INMETRO (Brazil)	No.: BRA 22.GE0004X (option E25)		
Explosion protection as per ATEX	BVS 18 ATEX E 049X		
• 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 V, I _i = 101 mA, P _i = 760 mW U _i = 29 V, I _i = 110 mA, P _i = 800 mW		
- Effective internal inductance/capacitance	L _i = 0.24 μH/C _i = 3.29 nF		

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Level

Technical specifications (continued)

SITRANS P320 / SITRANS P420 for level	
• 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 • Explosion protection according to CSA - NAMUR recommendations • NE 06 • NE 21 • NE 23 • NE 43 • NE 53 • NE 80 • NE 105 • NE 107 • NE 131	Ex II 1/2 G Ex ia/db IIC T4/T6 Ga/Gb -40 ... +80 °C (-40 ... +176 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 -40 ... +100 °C (-40 ... +212 °F) temperature class T4 -40 ... +70 °C (-40 ... +158 °F) temperature class T6 To a circuit with the operating values: $U_n = 10.5 \dots 45 \text{ V}$, 4 ... 20 mA Ex II 1D Ex tb IIIC T120 °C Da Ex II 2D Ex tb IIIC T120 °C Db Ex II 3D Ex tc IIIC T120 °C Dc -40 ... +80 °C (-40 ... +176 °F) -40 ... +100 °C (-40 ... +212 °F) 120 °C (248 °F) To a circuit with the operating values: $U_n = 10.5 \dots 45 \text{ V}$, 4 ... 20 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: $U_i = 30 \text{ V}$, $I_i = 101 \text{ mA}$, $P_i = 760 \text{ mW}$ $U_i = 29 \text{ V}$, $I_i = 110 \text{ mA}$, $P_i = 800 \text{ mW}$ $L_i = 0.24 \mu\text{H}/C_i = 3.29 \text{ nF}$ 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: $U_n = 10.5 \dots 30 \text{ V}$, 4 ... 20 mA No.: FM19US0155X No.: CSA18CA70163103 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 with Analog Output Signal Software and Hardware of Field Devices and Signal Processing Devices with Digital Electronics The Application of the Pressure Equipment Directive to Process Control Devices Requirements 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.

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

Technical specifications (continued)

Communication	
HART	
HART Protocol	230 ... 1 100 Ω
Software for computer	HART 7
	SIMATIC PDM
PROFINET over Ethernet APL	
Name of the station	DCP protocol (default setting address 126)
Cyclic data usage	
• Output byte	≤ 35 (7 measured values)
• Input byte	0, 1, or 2 (register operation mode and reset function for dosing)
Internal preprocessing	
Device profile	PA Profile Version 4.02 Device ID 0xB310
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 curve 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 mode
PROFINET IO functions	
Number of DeviceAccess AR	1

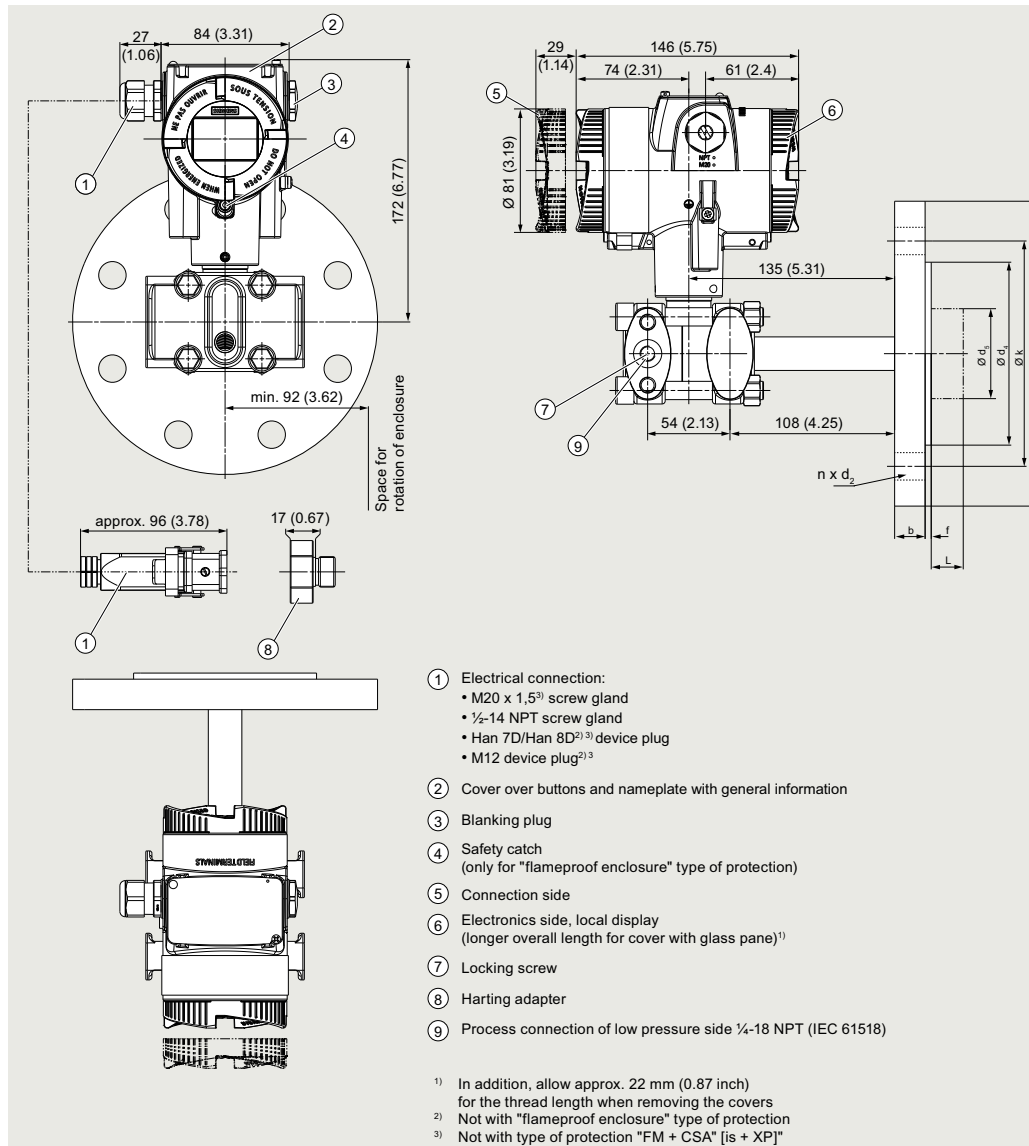
Communication	
Network diagnostics	via SNMP (Simple Network Management Protocol)
System redundancy	S2
Minimum device interval	32 ms
Support of start parameters	Yes
Diagnostic features	Advanced diagnostics incl. NAMUR NE107 support
FOUNDATION Fieldbus	
Device profile	FF ITK 6
Function blocks	3 function 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)
- Failure behavior	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 mode

Pressure measurement

Pressure transmitters

for applications with advanced requirements / SITRANS P320/P420 / Level

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 / SITRANS P320/P420 / Level

Dimensional drawings (continued)

Connection to EN 1092-1

Nominal diameter	Rated 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
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	26	195	26	102	48.3	40	51	2	145	4	
	PN 100	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	Rated pressure	b	D	d ₂	d ₄	d ₅	d _M with tube	d _M without tube	f	k	n	L
	Class	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)	Inch (mm)		Inch (mm)
1½ inches	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 inches	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 inches	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 inches	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 inches	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	Rated 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	10 K	14 (0.55)	155 (6.10)	19 (0.75)	96 (3.78)	48.3 (1.9)	40 (1.57)	51 (2.01)	2	120 (4.72)	4	0, 50, 100, 150 or 200 (0, 2, 3.94, 5.94 or 7.87)
	20 K	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	
	40 K	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	10 K	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	
	20 K	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	
	40 K	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	10 K	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	
	20 K	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	
	40 K	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_M: Effective diaphragm diameter

Pressure measurement

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More information

Specification of process conditions for selection and ordering data

Ambient temperature range

The standard remote seal systems are optimized for an ambient temperature range of -10 to +50 °C (14 to +122 °F). Therefore, in the ordering options, the **order code "D66"** is preset.

If the range of the ambient temperature deviates from this, you have the possibility to choose other ambient temperature ranges:

- With the **order code D67**, a range from -40 to +50 °C (-40 to +122 °F)
- With the **order code D68**, a range from -10 to +85 °C (14 to +185 °F)

In the case of a **special design**, which you can select with the **order option Y99** in the device settings, it is possible to enter the ambient temperature as a numerical value.

Process temperature

The standard optimization for the process temperature depends on the filling liquid used:

Filling liquid	Code	Optimized temperature range as standard
Silicone M50	B	-10 ... +200 °C (14 ... +392 °F)
High-temperature oil	C	-10 ... +300 °C (14 ... +572 °F)
Silicone oil M5	A	-40 ... +140 °C (-40 ... +284 °F)
Food oil (FDA-listed)	E	-10 ... +140 °C (14 ... +284 °F)
Halocarbon oil	D	-20 ... +60 °C (-4 ... +140 °F)
Neobee M20 (FDA-listed)	R	-10 ... +140 °C (14 ... +284 °F)

- If the **process temperatures deviate** from the temperature ranges mentioned in the table above, we ask you to send the process temperature with the **order code Y50** along with the order.
- If the remote seal has a small diameter (< DN 50/2") or a long capillary (> 4 m), we also ask you to provide the process data with the **following order code** when ordering.

These entries are transmitted and ensure the correct functioning of the remote seal systems.

	Order code
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
Ambient temperature min. ... °C/(°F)/max. ... °C/(°F)	D69+Y51

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Selection and ordering data

	Article No.	Option
Mounting bracket and fastening parts		
Mounting bracket for gauge and absolute pressure transmitter (7MF0*[0;2]*-*****M*), zinc-plated steel with 5/16-24 UNF screw set, pipe bracket with accessories	7MF7900-1AB	
Mounting bracket for gauge and absolute pressure transmitter (7MF0*[0;2]*-*****F*), zinc-plated steel with M8 screw set, pipe bracket with accessories	7MF7900-1AC	
Mounting bracket for gauge and absolute pressure transmitter (7MF0*[0;2]*-*****M*), stainless steel 1.4404/316L with 5/16-24 UNF screw set, pipe bracket with accessories	7MF7900-1AH	
Mounting bracket for gauge and absolute pressure transmitter (7MF0*[0;2]*-*****F*), stainless steel 1.4404/316L with M8 screw set, pipe bracket with accessories	7MF7900-1AJ	
Mounting bracket for differential pressure transmitter DP gauge/DP abs. and DP160, DP420 (7MF0*[1;3;4;5]*), zinc-plated steel with 7/16-20 UNF screw set, pipe bracket with accessories	7MF7900-2AB	
Mounting bracket for differential pressure transmitter DP gauge/DP abs. and DP160 (7MF0*[1;3;4]*), zinc-plated steel with M10 screw set, pipe bracket with accessories	7MF7900-2AC	
Mounting bracket for differential pressure transmitter DP420 (for 7MF0*5*), zinc-plated steel with M12 screw set, pipe bracket with accessories	7MF7900-2AD	
Mounting bracket for differential pressure transmitter DP gauge/DP abs. and DP160, DP420 (7MF0*[1;3;4;5]*), stainless steel 1.4404/316L with 7/16-20 UNF screw set, pipe bracket with accessories	7MF7900-2AH	
Mounting bracket for differential pressure transmitter DP gauge/DP abs. and DP160 (7MF0*[1;3;4]*), stainless steel 1.4404/316L with M10 screw set, pipe bracket with accessories	7MF7900-2AJ	
Mounting bracket for differential pressure transmitter DP420 (for 7MF0*5*), stainless steel 1.4404/316L with M12 screw set, pipe bracket with accessories	7MF7900-2AK	
Reinforced mounting bracket, for differential pressure transmitter DP gauge/DP abs. and DP160, DP420 (for 7MF0*[1;3;4;5]*), zinc-plated steel, incl. 7/16-20UNF screw set, stainless steel	7MF7900-2BB	
Reinforced mounting bracket, for differential pressure transmitter DP gauge/DP abs. and DP160 (7MF0*[1;3;4]*), zinc-plated steel, incl. M10 screw set, stainless steel	7MF7900-2BC	
Reinforced mounting bracket, for differential pressure transmitter DP420 (7MF0*5*), zinc-plated steel, reinforced incl. M12 screw set, stainless steel	7MF7900-2BD	
Mounting bracket for vibration-free mounting, for gauge, absolute and differential pressure transmitter (7MF0***-*****M*), stainless steel 1.4404/316L, incl. 5/16-24 UNF screw set, pipe bracket incl. accessories	7MF7900-3AH	
Mounting bracket for vibration-free mounting, for gauge, absolute and differential pressure transmitter (7MF0***-*****F*), stainless steel 1.4404/316L, incl. M8 screw set, pipe bracket incl. accessories	7MF7900-3AJ	
Lid		
Aluminum lid, 2x painted, without glass, with NBR gasket	7MF7901-1BB	
Aluminum lid, 2x painted, without glass, with FVMQ gasket	7MF7901-1BC	
Aluminum lid, 2x painted, with glass, with NBR gasket	7MF7901-1BG	
Aluminum lid, 2x painted, with glass, with FVMQ gasket	7MF7901-1BH	
Stainless steel investment casting lid, without glass, with NBR gasket	7MF7901-2AB	
Stainless steel investment casting lid, without glass, with FVMQ gasket	7MF7901-2AC	
Stainless steel investment casting lid, with glass, with NBR gasket	7MF7901-2AG	
Stainless steel investment casting lid, with glass, with FVMQ gasket	7MF7901-2AH	
Gasket for lid, 67.94 × 2.62 NBR 70 Shore A (10 units)	7MF7901-7AB	
Gasket for lid, 67.94 × 2.62 FVMQ (10 units)	7MF7901-7AC	
Local display		
Complete digital display, with fixing accessories, without Siemens logo	7MF7902-1AC	
Application electronics		
Electronics HART, Ex i	7MF7903-1AB	
• S/N specification for electronics (only with 7MF7903-1AB)		Y55
Electronics PROFIBUS PA, Ex i	7MF7903-1BB	
• S/N specification for electronics (only with 7MF7903-1BB)		Y55
Electronics FOUNDATION Fieldbus, Ex i	7MF7903-1CB	
• S/N specification for electronics (only with 7MF7903-1CB)		Y55
Connection board		
HART connection board, without overvoltage protection, with fixing accessories	7MF7903-2AB	
HART connection board, with overvoltage protection, with fixing accessories	7MF7903-2AC	
PROFIBUS PA connection board, without overvoltage protection, with fixing accessories	7MF7903-2BB	

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Selection and ordering data (continued)

	Article No.	Option
FOUNDATION Fieldbus connection board, without overvoltage protection, with fixing accessories	7MF7903-2CB	
Overvoltage protection		
Overvoltage protection up to 6 kV (external), M20×1.5 (for SITRANS P320/P420)	7MF7903-7AB	
Overvoltage protection up to 6 kV (external), ½-14 NPT (for SITRANS P320/P420)	7MF7903-7AC	
Key insert		
Control keys and mounting insert with EPDM gasket	7MF7904-1AG	
Control keys and mounting insert with FVMQ gasket	7MF7904-1AH	
Nameplate		
Nameplate, labeled, with grooved pin fixing accessories	7MF7905-1AC	
• S/N specification for nameplate, labeled (only with 7MF7905-1AC)		Y55
Ex plate		
Ex plate, labeled, with grooved pin fixing accessories	7MF7905-1BC	
• S/N specification for Ex plate, labeled (only with 7MF7905-1BC)		Y55
Remote seal plate		
Remote seal plate, labeled, with grooved pin fixing accessories	7MF7905-1CC	
• S/N specification for remote seal plate, labeled (only with 7MF7905-1CC)		Y55
TAG plate		
TAG plate, unlabeled, with fixing accessories, wire, end sleeve (10 units)	7MF7905-1DB	
TAG plate, labeled according to S/N, with fixing accessories, wire, end sleeve	7MF7905-1DC	
S/N specification for TAG plate, labeled (only with 7MF7905-1DC)		Y55
TAG plate, labeled according to text specification, with fixing accessories, wire, end sleeve	7MF7905-1DD	
• Measuring range setting: Lower range value (max. 5 characters), upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi (only with 7MF7905-1DD)		Y01
• Plant designation (TAG) (on stainless steel plate, max. 32 characters) (only with 7MF7905-1DD)		Y15
• Measuring point description (on stainless steel plate, max. 32 characters) (only with 7MF7905-1DD)		Y16
Ex and remote seal stickers		
Ex and remote seal stickers, labeled	7MF7905-3CC	
• S/N specification of pressure measuring device for Ex and remote seal stickers, labeled (only with 7MF7905-3CC)		Y55
• S/N specification of remote seal for Ex and remote seal stickers, labeled (only with 7MF7905-3CC)		Y56
Electrical connection/cable gland		
M20×1.5 cable gland, gray plastic, not Ex, cable Ø 6 ... 12 mm	7MF7906-1AB	
M20×1.5 cable gland, blue plastic, Ex i, cable Ø 6 ... 12 mm	7MF7906-1AC	
M20×1.5 cable gland, nickel-plated brass, not Ex, cable Ø 6 ... 12 mm	7MF7906-1AD	
M20×1.5 cable gland, nickel-plated brass, Ex d,e,i,t. Approval details on request, cable Ø 6 ... 12 mm	7MF7906-1AE	
M20×1.5 cable gland, 1.4404, not Ex, cable Ø 6 ... 12 mm	7MF7906-1AH	
M20×1.5 cable gland, 1.4404, Ex d,e,i,t. Approval details on request, cable Ø 6 ... 12 mm	7MF7906-1AJ	
½-14 NPT cable gland, gray plastic, not Ex, cable Ø 6 ... 12 mm	7MF7906-1BB	
½-14 NPT cable gland, blue plastic, Ex i, cable Ø 6 ... 12 mm	7MF7906-1BC	
½-14 NPT cable gland, nickel-plated brass, not Ex, cable Ø 6 ... 12 mm	7MF7906-1BD	
½-14 NPT cable gland, nickel-plated brass, Ex d,e,i,t. Approval details on request, cable Ø 6 ... 12 mm	7MF7906-1BE	
½-14 NPT cable gland, 1.4404, not Ex, cable Ø 6 ... 12 mm	7MF7906-1BH	
½-14 NPT cable gland, 1.4404, Ex d,e,i,t. Approval details on request, cable Ø 6 ... 12 mm	7MF7906-1BJ	
½-14 NPT cable gland, CMP, nickel-plated brass, Ex d,e,i,t. Approval details on request, cable Øi 6.1 ... 11.7 mm, Øa 9.5 ... 15.9 mm	7MF7906-1NE	
½-14 NPT cable gland, Capri ADE 4F cpl., nickel-plated brass, Ex d,i. Approval details on request, cable Øi 7 ... 12 mm, Øa 10 ... 16 mm	7MF7906-1PE	
½-14 NPT cable gland, Capri ADE 4F cpl., stainless steel (316L), Ex d,i. Approval details on request, cable Øi 7 ... 12 mm, Øa 10 ... 16 mm	7MF7906-1PJ	

Selection and ordering data (continued)

	Article No.	Option
Electrical connection/device plug, cable socket		
HAN 7D device plug, gray plastic, straight	7MF7906-2AB	
HAN 7D device plug, gray plastic, angled	7MF7906-2AC	
HAN 7D device plug, gray metal, straight	7MF7906-2AN	
HAN 7D device plug, gray metal, angled	7MF7906-2AP	
HAN 7D device plug, blue metal, straight	7MF7906-2AQ	
HAN 7D device plug, blue metal, angled	7MF7906-2AR	
HAN 7D cable socket, gray plastic, straight, cable Ø 6 ... 12 mm, core cross-section 1.0 mm ²	7MF7906-2BB	
HAN 7D cable socket, gray metal, straight, cable Ø 6 ... 12 mm, core cross-section 1.0 mm ²	7MF7906-2BN	
HAN 7D cable socket, blue metal, straight, cable Ø 6 ... 12 mm, core cross-section 1.0 mm ²	7MF7906-2BQ	
HAN 8D device plug, gray plastic, straight	7MF7906-2EB	
HAN 8D device plug, gray plastic, angled	7MF7906-2EC	
HAN 8D device plug, gray metal, straight	7MF7906-2EN	
HAN 8D device plug, gray metal, angled	7MF7906-2EP	
HAN 8D device plug, blue metal, straight	7MF7906-2EQ	
HAN 8D device plug, blue metal, angled	7MF7906-2ER	
HAN 8D cable socket, gray plastic, straight, cable Ø 6 ... 12 mm, core cross-section 1.0 mm ²	7MF7906-2FB	
HAN 8D cable socket, gray metal, straight, cable Ø 6 ... 12 mm, core cross-section 1.0 mm ²	7MF7906-2FN	
HAN 8D cable socket, blue metal, straight, cable Ø 6 ... 12 mm, core cross-section 1.0 mm ²	7MF7906-2FQ	
HAN 7D device plug, metal, EMC, straight (for 7MF0*[1;3;4;5;6]*-*****-**F*)	7MF7906-2NN	
HAN 7D device plug, metal, EMC, angled (for 7MF0*[0;2]*-*****-**F*)	7MF7906-2NP	
HAN 7D cable socket, metal, EMC, straight, incl. Jacob cable gland, cable Ø 9 ... 13 mm, for core cross-section 0.5 mm ² (for 7MF0*[0;2]*-*****-**F*)	7MF7906-2PN	
HAN 7D cable socket, metal, EMC, angled, incl. Jacob cable gland, cable Ø 9 ... 13 mm, for core cross-section 0.5 mm ² (for 7MF0*[1;3;4;5;6]*-*****-**F*)	7MF7906-2PP	
HAN 7D cable socket, metal, EMC, straight, incl. Lapp cable gland, cable Ø 7.5 ... 9 mm, for core cross-section 0.5 mm ² (for 7MF0*[0;2]*-*****-**F*)	7MF7906-2QN	
HAN 7D cable socket, metal, EMC, angled, incl. Lapp cable gland, cable Ø 7.5 ... 9 mm, for core cross-section 0.5 mm ² (for 7MF0*[1;3;4;5;6]*-*****-**F*)	7MF7906-2QP	
M20 adapter for HAN 7D/HAN 8D device plug, aluminum, with O-ring	7MF7906-2WB	
Adapter for HAN 7D/HAN 8D device plug, 1.4404, with O-ring	7MF7906-2WC	
M12 device plug, M20×1.5, stainless steel, pre-assembled for PROFIBUS PA	7MF7906-3AH	
M12 device plug, M20×1.5, stainless steel, with 4 cores	7MF7906-3AJ	
M12 cable socket, stainless steel (core cross-section Phoenix: 0.25 ... 0.75 mm ² , Weidmüller: max. 0.5 mm ²)	7MF7906-3WC	
Electrical connection/sealing plug		
M20×1.5 sealing plug, black plastic, not Ex	7MF7906-7AB	
M20×1.5 sealing plug, nickel-plated brass, not Ex	7MF7906-7AD	
M20×1.5 sealing plug, zinc-plated S235JR, Ex d, with gasket	7MF7906-7AG	
M20×1.5 sealing plug, 1.4404, Ex d, with gasket	7MF7906-7AJ	
½-14 NPT sealing plug, zinc-plated S235JR, Ex d	7MF7906-7BG	
½-14 NPT sealing plug, A4, Ex d	7MF7906-7BJ	
Process flanges/sealing screw		
¼-18 NPT sealing screw, stainless steel (2 units)	7MF7910-1AB	
¼-18 NPT sealing screw, Hastelloy C-22/2.4602 (2 units)	7MF7910-1AC	
¼-18 NPT sealing screw, Monel 400/2.4360 (2 units)	7MF7910-1AD	
Process flanges/vent valve		
¼-18 NPT vent valve, stainless steel (2 units)	7MF7910-1BB	
¼-18 NPT vent valve, Hastelloy C-22/2.4602 (2 units)	7MF7910-1BC	
¼-18 NPT vent valve, Monel 400/2.4360 (2 units)	7MF7910-1BD	
Process flanges/screen filter		
Screen for ¼-18 NPT thread (10 units)	7MF7910-7AB	

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Selection and ordering data (continued)

	Article No.	Option
Process flanges/gaskets		
O-ring for process flanges, 39.5×1.78 FEP (2 units)	7MF7910-8AD	
O-ring for process flanges, 39×1.8 FFKM (FFPM) (2 units)	7MF7910-8AE	
O-ring for process flanges, 39×1.8 NBR (10 units)	7MF7910-8AF	
O-ring for process flanges, 39.5×1.78 EPDM with WRAS, ACS, NSF61 (2 units)	7MF7910-8AG	
O-ring for process flanges, 39.5×1.78 EPDM with NSF61 (2 units)	7MF7910-8AH	
O-ring for process flanges, 39.5×1.78 FKM (FPM) (10 units) (successor of 7MF7910-8AB)	7MF7910-8AJ	
O-ring for process flanges, 38.2×1.9 PTFE (10 units) (successor of 7MF7910-8AC)	7MF7910-8AK	
Gasket for process flanges, 38.3×42.7×1.5 copper (2 units) (successor of 7MF7910-8AN)	7MF7910-8AP	
Gasket for process flanges, 1× chambered, square 41×46×1.85 graphite (10 units)	7MF7910-8BB	
Gasket for process flanges, 1× chambered, square 41×45×2 PTFE (2 units)	7MF7910-8BD	
Other accessories		
Weld-in unit	7MF7911-1CA	
• For tank connection TG52/50		Q90
• For tank connection TG52/150		Q91
• For process connection PMC Style Standard		R02
• For process connection PMC Style Minibolt with fixing screw, washer		R03
7/16-20UNFx1 3/4"-SD (1.4980) screw set, high-strength, incl. graphite gasket for oval flange (for 7MF0*Q***G***; 7MF0*2***G***)	7MF7911-7WF	
M12x40-SD (1.4980) screw set, high-strength incl. graphite gasket for oval flange (for 7MF0*Q***J***; 7MF0*2***J***)	7MF7911-7WG	
FKM (FPM) gasket	7MF7911-8BB	
• For PMC Style Minibolt (5 units)		R01
PTFE gasket	7MF7911-8BC	
• For PMC Style Standard (5 units)		R00
Silicone gasket	7MF7911-8BH	
• For tank connection TG52/50 or TG52/150 (5 units)		Q00
Ground terminal set with sheet, screw, washer, stainless steel 1.4404/316L	7MF7920-2AB	
Customized parts for Y99	7MF7948-8YY	
• Customized parts in free text (only with 7MF7948-8YY)		Y99