ACCU P320/P420

1.1 Technical description

ACCU 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.

1.2 for gauge pressure (pressure series)

Technical specifications

ACCU P320/ACCU P420 for gauge pressure (pressure series)			
Input			
Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range, max. permissible operating pressure (in accordance with Pressure Equipment Directive 2014/68/EU) and max. test pressure (pursuant to DIN 16086) (for oxygen measurement, max. 100 bar/10 MPa/1450 psi and 60 °C (140 °F) ambient temperature/process 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

ACCU P320/ACCU P420 for gauge pressure (pressure series)	
Measuring limits	
• Low 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 oil	30 mbar a/3 kPa a/0.44 psi a
- Measuring cell with FDA-compliant oil	100 mbar a/10 kPa a/1.45 psi a
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/process temperature)
• Lower range value	Between the measuring limits (infinitely adjustable)
Output	**HART**
Output signal	4 ... 20 mA
• Low saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA
• High saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current
Adjustable damping	0 … 100 s, continuously adjustable over remote operation 0 … 100 s, in increments of 0.1 s, adjustable over display
• Current transmitter	3.55 … 22.8 mA
• Failure signal	3.55 … 22.8 mA (factory preset to 3.55 mA)
Load	Resistor R [Ω]
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld)) R = 230 … 500 Ω (SIMATIC PDM)
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)
Physical bus	-
Polarity-independent	-
Measurement accuracy	
Reference conditions	• According to EN 60770-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span and nominal measuring range
• Linear characteristic	
- 250 mbar/25 kPa/3.6 psi	r ≤ 1.25: ≤ 0.075% (ACCU P320)

ACCU P320/ACCU P420 for gauge pressure (pressure series)		
		≤ 0.065% (ACCU P420)
	1.25 < r ≤ 30:	≤ (0.008 · r + 0.055)%
- 1 bar/100 kPa/14.5 psi	r ≤ 5:	≤ 0.065% (ACCU P320)
4 bar/400 kPa/58 psi		≤ 0.04% (ACCU P420)
16 bar/1.6 MPa/232 psi	5 < r ≤ 100:	≤ (0.004 · r + 0.045)%
63 bar/6.3 MPa/914 psi		
160 bar/16 MPa/2321 psi		
- 400 bar/40 MPa/5802 psi	r ≤ 3:	≤ 0.075% (ACCU P320)
700 bar/70 MPa/10152 psi	3 < r ≤ 100:	≤ (0.005 · r + 0.05)% (ACCU P320)
	r ≤ 5:	≤ 0.075% (ACCU P420)
	5 < r ≤ 100:	≤ (0.005 · r + 0.05)% (ACCU P420)

ACCU P320/ACCU P420 for gauge pressure (pressure series)	
Influence of ambient temperature in % per 28 °C (50 °F))	
• 250 mbar/25 kPa/3.6 psi	≤ (0.16 · r + 0.1)%
• 1 bar/100 kPa/14.5 psi	≤ (0.05 · r + 0.1)%
• 4 bar/400 kPa/58 psi 16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi 160 bar/16 MPa/2321 psi 400 bar/40 MPa/5802 psi	≤ (0.025 · r + 0.125)%
• 700 bar/70 MPa/10152 psi	≤ (0.08 · r + 0.16)%
Long-term stability at ±30 °C (±54 °F)	
• 250 mbar/25 kPa/3.6 psi	≤ (0.25 · r)% per year
• 1 bar/100 kPa/14.5 psi	In 5 years ≤ (0.25 · r)% In 10 years ≤ (0.35 · 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 ≤ (0.125 · r)% In 10 years ≤ (0.15 · r)%
• 700 bar/70 MPa/10152 psi	In 5 years ≤ (0.25 · r)% In 10 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)	≤ 0.05 mbar/0.005 kPa/0.000725 psi per 10° incline (zero point correction is possible with position error compensation)
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V
Operating conditions	
Temperature of medium	
• Measuring cell with silicone oil filling	-40 ... +100 °C (-40 ... +212 °F)
• Measuring cell with inert 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 oil	-10 ... +100 °C (14 ... +212 °F)
Ambient conditions	
• Ambient temperature/enclosure	Observe the temperature class in areas subject to explosion hazard.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil for gauge pressure measuring cells: 1 bar/100 kPa/14.5 psi 4 bar/400 kPa/58 psi	-40 ... +85 °C (-40 ... +185 °F)

ACCU P320/ACCU P420 for gauge pressure (pressure series)	
16 bar/1.6 MPa/232 psi 63 bar/6.3 MPa/914 psi	
- Measuring cell with inert oil	-40 … +85 °C (-40 … +185 °F)
- Measuring cell with FDA-compliant oil	-10 ... +85°C (14 ... +185°F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F) (with FDA-compliant oil: -20 ... + 85 °C (-4 ... +185 °F))
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21

Mechanical construction	
Weight	Approx. 2.3 kg (5.07 lb) with aluminum enclosure Approx. 4.2 kg (9.25 lb) for stainless steel enclosure
Material	
• Wetted parts materials	
- Process connection	Stainless steel, material no. 1.4404/316L or Alloy C22, material no. 2.4602
- Oval flange	Stainless steel, mat. no. 1.4404/316L
- Seal diaphragm	Stainless steel, material no. 1.4404/316L or Alloy C276, material no. 2.4819
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel type plate (1.4404/316L)
- Mounting bracket	Electrogalvanized steel or stainless steel
Process connection	• Connection shank G1/2A according to EN 837-1 • Female thread ½-14 NPT • Oval flange (PN 160 (MWP 2320 psi g)) with fastening screw thread: - 7/16-20 UNF according to EN 61518 - M10 according to DIN 19213 • Oval flange (PN 420 (MWP 2320 psi g)) with fastening screw thread: - 7/16-20 UNF according to EN 61518 - M12 according to DIN 19213 • Male thread M20 x 1.5 and ½-14 NPT
Electrical connection	Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12

Displays and controls

ACCU P320/ACCU P420 for gauge pressure (pressure series)		
Keys	4 buttons for operation directly on the device	
Display	• With or without integrated display (optional) • Cover with inspection window (optional)	
Auxiliary power U_H		
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod	
Ripple	U_{SS} ≤ 0.2 V (47 … 125 Hz)	
Noise	U_{eff} ≤ 1.2 mV (0.5 … 10 kHz)	
Auxiliary power	–	
Separate supply voltage	–	
HART		230 ... 1100 Ω
Protocol		HART 7
Software for computer		SIMATIC PDM

Selection and ordering data

Pressure transmitters for gauge pressure (pressure series)	Article No.
ACCU P320	**A C C U 3 0 ● - ● ● ● ● ● - ● ● ● ●**
ACCU P320	**A C C U 3 2 ● - ● ● ● ● ● - ● ● ● ●**
Click the article no. for online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
Measuring cell filling	
Silicone oil	**1**
Inert liquid	**3**
Neobee oil	**4**
Maximum measuring span	
250 mbar (3.6 psi)	**F**
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	
Male thread M20 x 1.5	**B**
Male thread G½ (DIN EN 837-1)	**D**
Female thread ½-14 NPT	**E**
Male thread ½-14 NPT	**F**
Oval flange, mounting thread: $^{7}/_{16}$-20 UNF (IEC 61518)	**G**
Oval flange, mounting thread: M10 (DIN 19213)	**H**
Oval flange, mounting thread: M12 (DIN 19213)	**J**
Version for diaphragm seal pressure	**U**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819	**1**
Alloy C22/2.4602, alloy C276/2.4819	**2**
Non-wetted parts materials	
Die-cast aluminum	**1**
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	

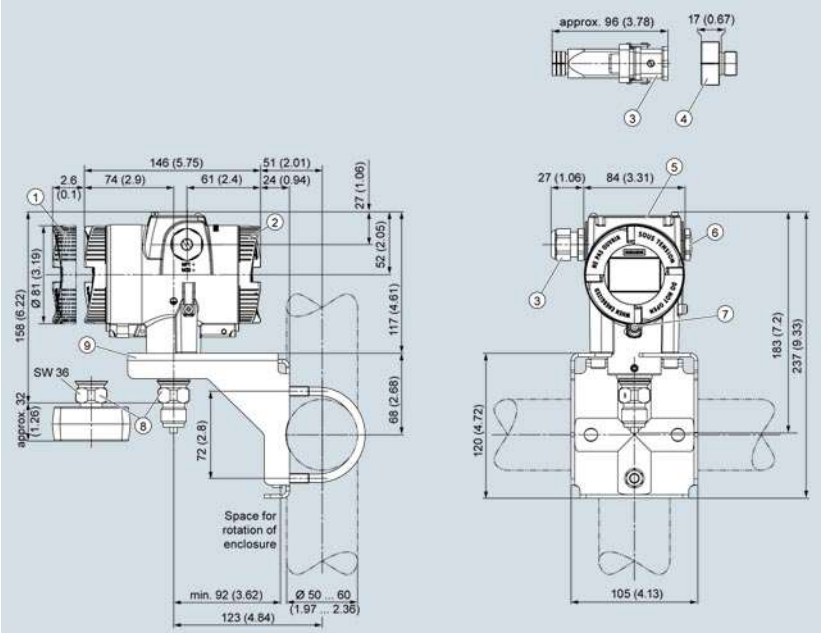
Pressure transmitters for gauge pressure (pressure series)	Article No.	
ACCU P320	**A C C U 3 0 ● - ● ● ● ● ● - ● ● ● ●**	
ACCU P320	**A C C U 3 2 ● - ● ● ● ● ● - ● ● ● ●**	
• 2 x M20 x 1.5		**F**
• 2 x ½-14 NPT		**M**
Local operation/display		
Without display (cover closed)		**0**
With display (cover closed)		**1**
With display (cover with glass pane)		**2**

Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable gland/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/device plug mounted left	**A97**
Cable gland/device plug mounted right	**A99**
Nameplate labeling (standard labeling: English, unit bar)	
German (bar)	**B11**
French (bar)	**B12**
Spanish (bar)	**B13**
Italian (bar)	**B14**

Options	Order code
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Mounting bracket	
Steel, galvanized	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Flange connections with flange EN 1092-1	
With flange adapter G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J80**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J81**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J82**
With siphon G½ Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J83**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J84**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J85**
• DN 25 PN 100, stainless steel 1.4571/316Ti	**J86**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
Seal (EN 837-1) material Fe (soft iron)	**K60**
Seal (EN 837-1) material 1.4571	**K61**
Seal (EN 837-1) material Cu	**K62**
Process connection	
Process connection male thread G½, bore hole 11 mm	**K80**
Shut-off valves, valve manifolds	
With mounted valve manifold 7MF9011-4EA, process connection at transmitter G½ shank, PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	**T02**
With mounted valve manifold 7MF9011-4FA, process connection at transmitter female thread ½-14 NPT, sealing tape. With PTFE sealing ring and pressure test certified in factory certificate (EN 10204-2.2)	**T03**
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	**T05**
With mounted valve manifold 7MF9411-5AA, process connection at transmitter oval flange with PTFE gasket, stainless steel mounting screws, pressure test certified in factory certificate (EN 10204-2.2)	**T06**
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...],	**Y01**

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

Dimensional drawings



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

1.3 for gauge pressure (differential pressure series)

Technical specifications

ACCU P320 / ACCU P420 for differential pressure and flow PN160 (differential pressure series)			
Input			
Measured variable	Gauge pressure		
Measuring span (infinitely adjustable) or measuring range and maximum operating pressure (pursuant to Pressure Equipment Directive 2014/68/EU)	Measuring span	Max. permissible operating pressure MAWP (PS)	Maximum permissible test pressure
	1 ... 20 mbar 0.1 ... 2 kPa 0.4019 … 8.037 inH_2O	160 bar 16 MPa 2320 psi	240 bar 24 MPa 3481 psi
	1 ... 60 mbar 0.1 ... 6 kPa 0.4019 … 24.11 inH_2O	160 bar 16 MPa 2320 psi	240 bar 24 MPa 3481 psi
	2.5 ... 250 mbar 0.2 ... 25 kPa 1.005 … 100.5 inH_2O	160 bar 16 MPa 2320 psi	240 bar 24 MPa 3481 psi
	6 ... 600 mbar 0.6 ... 60 kPa 2.41 … 241.1 inH_2O	160 bar 16 MPa 2320 psi	240 bar 24 MPa 3481 psi
	16 ... 1600 mbar 1.6 ... 160 kPa 6.43 … 643 inH_2O	160 bar 16 MPa 2320 psi	240 bar 24 MPa 3481 psi
	50 ... 5000 mbar 5 ... 500 kPa 20.09 … 2009 inH_2O	160 bar 16 MPa 2320 psi	240 bar 24 MPa 3481 psi
	0.3 ... 30 bar 0.03 ... 3 MPa 4.35 … 435 psi	160 bar 16 MPa 2320 psi	240 bar 24 MPa 3481 psi
	5 ... 100 bar 0.5 ... 10 MPa 76.9 … 1450 psi	160 bar 16 MPa 2320 psi	240 bar 24 MPa 3481 psi

ACCU P320 / ACCU P420 for differential pressure and flow PN160 (differential pressure series)	
Measuring limits	
• Low measuring limit	
- Measuring cell with silicone oil filling	30 mbar a/3 kPa a/0.44 psi a
- Measuring cell with inert oil	30 mbar a/3 kPa a/0.44 psi a
- Measuring cell with FDA-compliant oil	100 mbar a/10 kPa a/1.45 psi a
• Upper measuring limit	100% of the max. measuring span (for oxygen measurement max. 100 bar/10 MPa/ 1450 psi and 60 °C (140 °F) ambient temperature/process temperature)
• Lower range value	Between the measuring limits (infinitely adjustable)
Output	**HART**
Output signal	4 ... 20 mA
• Low saturation limit (infinitely adjustable)	3.55 mA, factory preset to 3.8 mA
• High saturation limit (infinitely adjustable)	22.8 mA, factory-set to 20.5 mA or optionally 22.0 mA
• Ripple (without HART communication)	I_{pp} ≤ 0.5% of max. output current
Adjustable damping	0 … 100 s, continuously adjustable over remote operation 0 … 100 s, in increments of 0.1 s, adjustable over display
• Current transmitter	3.55 … 22.8 mA
• Failure signal	3.55 … 22.8 mA
Load	Resistor R [Ω]
• Without HART communication	R = (U_H - 10.5 V)/22.8 mA, U_H: Power supply in V
• With HART communication	R = 230 … 1100 Ω (HART communicator (handheld)) R = 230 … 500 Ω (SIMATIC PDM)
Characteristic curve	• Linearly increasing or linearly decreasing • Linear increase or decrease or according to the square root (only for differential pressure and flow)
Physical bus	-
Polarity-independent	-
Measurement accuracy	
Reference conditions	• According to EN 60770-1 • Rising characteristic curve • Lower range value 0 bar/kPa/psi • Seal diaphragm stainless steel • Measuring cell with silicone oil filling • Room temperature 25 °C (77 °F)
Conformity error at limit point setting, including hysteresis and repeatability	
Measuring span ratio r (spread, Turn-Down)	r = max. measuring span/set measuring span and nominal measuring range
• Linear characteristic	
- 20 mbar/2 kPa/8.031 inH_2O	r ≤ 5: ≤ 0.075% 5 < r ≤ 20: ≤ (0.005 · r + 0.05)%
- 60 mbar/6 kPa/24.09 inH_2O	r ≤ 5: ≤ 0.075%

ACCU P320 / ACCU P420 for differential pressure and flow PN160 (differential pressure series)		
	5 < r ≤ 60:	≤ (0.005 · r + 0.05)%
- 250 mbar/25 kPa/3.6 psi	r ≤ 5:	≤ 0.065% (ACCU P320)
600 mbar/60 kPa/240.9 inH_2O		≤ 0.04% (ACCU P420)
1600 mbar/160 kPa/642.4 inH_2O	5 < r ≤ 100:	≤ (0.004 · r + 0.045)%
5000 mbar/500 kPa/2008 inH_2O		
30 bar/3 MPa/435 psi		
- 100 bar/10 MPa/1450 psi	r < 10:	= 0.1%
	10 < r < 30:	= 0.2%

ACCU P320 / ACCU P420 for differential pressure and flow PN160 (differential pressure series)	
Influence of ambient temperature in % per 28 °C (50 °F))	
• 20 mbar/2 kPa/8.031 inH_2O	≤ (0.15 · r + 0.1)%
• 60 mbar/6 kPa/24.09 inH_2O	≤ (0.075 · r + 0.1)%
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1600 mbar/160 kPa/642.4 inH_2O 5000 mbar/500 kPa/2008 inH_2O 30 bar/3 MPa/435 psi	≤ (0.025 · r + 0.125)% (ACCU P320)
• 250 mbar/25 kPa/3.6 psi 5000 mbar/500 kPa/2008 inH_2O	≤ (0.025 · r + 0.0625)% (ACCU P420)
• 600 mbar/60 kPa/240.9 inH_2O 1600 mbar/160 kPa/642.4 inH_2O 30 bar/3 MPa/435 psi	≤ (0.0125 · r + 0.0625)% (ACCU P420)
• 100 bar/10 MPa/1450 psi	0.08 · r + 0.16%
Long-term stability at ±30 °C (±54 °F)	
• 20 mbar/2 kPa/8.031 inH_2O	≤ (0.2 · r)% per year
• 60 mbar/6 kPa/24.09 inH_2O	In 5 years ≤ (0.25 · r)%
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1600 mbar/160 kPa/642.4 inH_2O 5000 mbar/500 kPa/2008 inH_2O	In 5 years ≤ (0.125 · r)% In 10 years ≤ (0.15 · r)%
• 30 bar/3 MPa/435 psi	In 5 years ≤ (0.25 · r)% In 10 years ≤ (0.35 · r)%
• 100 bar/10 MPa/1450 psi	In 5 years ≤ (0.25 · r)%
Step response time T_{63} (without electrical damping)	
• 20 mbar/2 kPa/8.031 inH_2O	Approx. 0.160 s
• 60 mbar/6 kPa/24.09 inH_2O	Approx. 0.150 s
• 250 mbar/25 kPa/3.6 psi 600 mbar/60 kPa/240.9 inH_2O 1600 mbar/160 kPa/642.4 inH_2O 5000 mbar/500 kPa/2008 inH_2O 30 bar/3 MPa/435 psi	Approx. 0.135 s
• 100 bar/10 MPa/1450 psi	Approx. 0.145 s
Effect of mounting position (in pressure per change of angle)	≤ 0.7 mbar/0.07 kPa/0.010 psi per 10° incline (zero offset is possible with position error compensation)
Effect of auxiliary power (in % per voltage change)	0.005% per 1 V
Operating conditions	
Temperature of medium	
• 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 100 bar (1450 psi)	-20 … +100 °C (-4 … +212 °F)
• Measuring cell with inert oil	-20 … +100 °C (-4 … +212 °F)
• In conjunction with dust explosion protection	-40 … +85 °C (-4 … +185 °F)
Ambient conditions	

ACCU P320 / ACCU P420 for differential pressure and flow PN160 (differential pressure series)	
• Ambient temperature/enclosure	Observe the temperature class in areas subject to explosion hazard.
- Measuring cell with silicone oil filling	-40 ... +85 °C (-40 ... +185 °F)
- Measuring cell with inert oil	-40 … +85 °C (-40 … +185 °F)
- Display	-20 … +80 °C (-4 … +176 °F)
• Storage temperature	-50 ... +85 °C (-58 ... +185 °F)
• Climatic class in accordance with IEC 60721-3-4	4K4H
• Degree of protection	
- According to IEC 60529	IP66, IP68
- According to NEMA 250	Type 4X
• Electromagnetic compatibility	
- Emitted interference and interference immunity	According to IEC 61326 and NAMUR NE 21
Mechanical construction	
Weight	Approx. 3.9 kg (8.5 lb) with aluminum enclosure Approx. 5.8 kg (12.7 lb) with stainless steel enclosure
Material	
• Wetted parts materials	
- Seal diaphragm	Stainless steel, mat. no. 1.4404/316L, Alloy C276, mat. no. 2.4819, Monel, mat. no. 2.4360, tantalum or gold
- Process flanges and sealing plugs	Stainless steel, mat. no. 1.4408 to PN 160, mat. no. 1.4571/316Ti for PN 420, Alloy C22, 2.4602 or Monel, mat. no. 2.4360
- O-ring	FPM (Viton) or optionally: PTFE, FEP, FEPM and NBR
• Non-wetted parts materials	
- Electronics enclosure	• Low-copper die-cast aluminum GD-AlSi 12 or stainless steel precision casting, mat. no. 1.4409/ CF-3M • Standard: Powder coating with polyurethane Option: 2 coats: Coat 1: epoxy-based; coat 2: Polyurethane • Stainless steel type plate (1.4404/316L)
- Pressure flange screws	Stainless steel ISO 3506-1 A4-70
- Mounting bracket	Steel, electrogalvanized steel, or stainless steel
Process connection	¼-18 NPT female thread and flange connection with 7/16-20 UNF fastening thread according to EN 61518 or M10 according to DIN 19213 (M12 for PN 420 (MWP 6092 psi))
Electrical connection	Screw terminals Cable entry via the following screwed glands: • M20 x 1.5 • ½-14 NPT • Device plug Han 7D/Han 8D[1)] • Device plug M12
Displays and controls	
Keys	4 buttons for operation directly on the device
Display	• With or without integrated display (optional) • Cover with inspection window (optional)
Auxiliary power U_H	
Terminal voltage on pressure transmitter	10.5 ... 45 V DC 10.5 ... 30 V DC in intrinsically safe mod
Ripple	U_{SS} ≤ 0.2 V (47 … 125 Hz)

ACCU P320 / ACCU P420 for differential pressure and flow PN160 (differential pressure series)	
Noise	U_{eff} ≤ 1.2 mV (0.5 … 10 kHz)
Auxiliary power	–
Separate supply voltage	–

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

Selection and ordering data

Pressure transmitters for differential pressure PN160 ACCU P320	Article No. A C C U 3 4 ● - ● ● ● ● ● - ● ● ● ●
Click the article no. for online configuration in the PIA Life Cycle Portal.	
Communication	
HART, 4 ... 20 mA	**0**
Measuring cell filling	
Silicone oil	**1**
Inert filling liquid	**3**
Maximum measuring span	
20 mbar (8.037 inH_2O)	**B**
60 mbar (24.11 inH_2O)	**D**
250 mbar (1005 inH_2O)	**G**
600 mbar (241.1 inH_2O)	**H**
1 600 mbar (643 inH_2O)	**M**
5 000 mbar (2009 inH_2O)	**P**
30 bar (435 psi)	**R**
Process connection	
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518)	**L**
Oval flange, mounting thread: M10 (PN 160), (DIN 19213)	**M**
Oval flange, mounting thread: $^7/_{16}$-20 UNF (IEC 61518) with lateral ventilation	**N**
Oval flange, mounting thread: M10 (PN 160) (DIN 19213) with lateral ventilation	**P**
Wetted parts materials: Process connection, seal diaphragm	
Stainless steel 316L/1.4404, stainless steel 316L/1.4404, process flange stainless steel 316/1.4408	**0**
Stainless steel 316L/1.4404, alloy C276/2.4819, process flange stainless steel 316/1.4408	**1**
Alloy C22/2.4602, alloy C276/2.4819, process flange stainless steel 316/1.4408	**2**
Tantalum/tantalum, process flange stainless steel 316/1.4408 (not in combination with maximum measuring span 20 mbar (0.29 psi) and 60 mbar (0.87 psi))	**4**
Monel 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**
Non-wetted parts materials	
Die-cast aluminum	**1**

Pressure transmitters for differential pressure PN160 ACCU P320	Article No. A C C U 3 4 ● - ● ● ● ● ● - ● ● ● ●
Stainless steel precision casting CF3M/1.4409 similar to 316L	**2**
Enclosure	
Dual chamber device	**5**
Type of protection	
Without Ex	**A**

Pressure transmitters for differential pressure PN160 ACCU P320	Article No. A C C U 3 4 ● - ● ● ● ● ● - ● ● ● ●
Electrical connections/cable entries	
Thread for cable gland: Cable gland must be ordered separately as option (Axx)	
• 2 x M20 x 1.5	**F**
• 2 x ½-14 NPT	**M**
Local operation/display	
Without display (cover closed)	**0**
With display (cover closed)	**1**
With display (cover with glass pane)	**2**

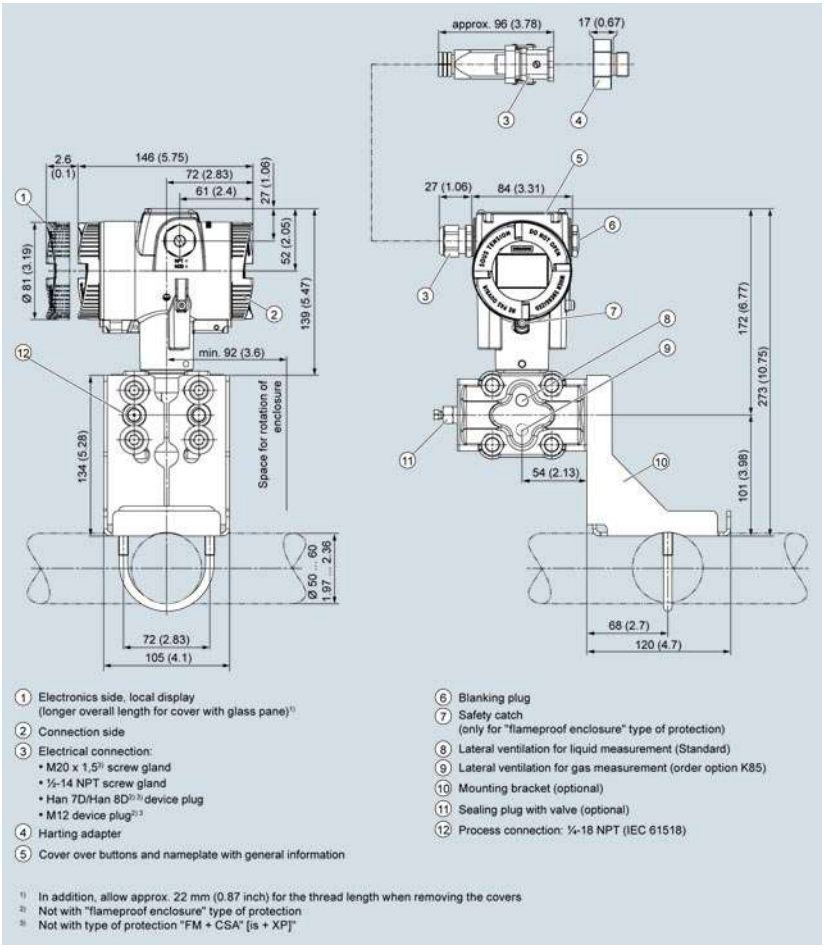
Options	Order code
Append "**-Z**" to Article No., add order code and plain text or entry from drop-down list.	
Cable glands included	
Plastic	**A00**
Metal	**A01**
Stainless steel	**A02**
Stainless steel 316L/1.4404	**A03**
CMP, for XP devices	**A10**
CAPRI ADE 4F, CuZn, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A11**
CAPRI ADE 4F, stainless steel, cable inner diameter 7 ... 12 mm, cable outer diameter 10 ... 16 mm	**A12**
Device plug Han mounted left	
Device plug Han 7D (plastic, straight)	**A30**
Device plug Han 7D (plastic, angled)	**A31**
Device plug Han 7D (metal, straight)	**A32**
Device plug Han 7D (metal, angled)	**A33**
Device plug Han 8D (plastic, straight)	**A34**
Device plug Han 8D (plastic, angled)	**A35**
Device plug Han 8D (metal, straight)	**A36**
Device plug Han 8D (metal, angled)	**A37**
Cable socket included	
Plastic, for device plug Han 7D and Han 8D	**A40**
Metal, for device plug Han 7D and Han 8D	**A41**
Device plug M12 mounted left	
Stainless steel, without cable socket	**A62**
Stainless steel, with cable socket	**A63**
Cable gland/device plug mounting	
2x sealing plugs M20 x 1.5, IP66/68 installed on both sides	**A90**
2x sealing plugs ½-14 NPT, IP66/68 installed on both sides	**A91**
Cable gland/device plug mounted left	**A97**
Cable gland/device plug mounted right	**A99**
Nameplate labeling **(standard labeling: English, unit bar)**	
German (bar)	**B11**
French (bar)	**B12**

Options	Order code
Spanish (bar)	**B13**
Italian (bar)	**B14**
Chinese (bar)	**B15**
Russian (bar)	**B16**
English (psi)	**B20**
English (Pa)	**B30**
Chinese (Pa)	**B35**
Certificates	
Quality test certificate, 5-point factory calibration (IEC 60770-2)	**C11**
Inspection certificate (EN 10204-3.1) - Material of pressurized and wetted parts	**C12**
Factory certificate - NACE (MR 0103-2012 and MR 0175-2009)	**C13**
Factory certificate (EN 10204-2.2) - Wetted parts	**C14**
Inspection certificate (EN 10204-3.1) - PMI test of pressurized and wetted parts	**C15**
Certificates for functional safety	
Functional Safety (IEC 61508) - SIL2/3	**C20**
Device options	
PDF file with device settings	**D10**
Double layer coating (epoxy resin and polyurethane) 120 µm of enclosure and cover	**D20**
FVMQ enclosure sealing	**D21**
Degree of protection IP66 / IP68 (not for device plugs M12 and Han)	**D30**
TAG label empty	**D40**
Without labeling of the measuring range on the TAG label	**D41**
Stainless steel Ex plate 1.4404/316L	**D42**
Overvoltage protection up to 6 kV (external)	**D71**
Labels on transport packaging (provided by customer)	**D90**
Mounting bracket	
Steel, galvanized	**H01**
Stainless steel 1.4301/304	**H02**
Stainless steel 1.4404/316L	**H03**
Process flanges; screw plug with vent valve	
Welded in on right	**J08**
Welded in on left	**J09**
Glued in on right	**J10**
Glued in on left	**J11**
Flange connections with flange EN 1092-1	
Form B1	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J70**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J71**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J72**
• DN 15 PN 40, stainless steel 1.4571/316Ti	**J78**
Form C	
• DN 25 PN 40, stainless steel 1.4571/316Ti	**J73**
• DN 50 PN 40, stainless steel 1.4571/316Ti	**J74**
• DN 80 PN 40, stainless steel 1.4571/316Ti	**J75**
Flange connection options	
Flange connection and temperature extension	**J76**
Flange connection with epoxy resin coating	**J77**
Process flanges; special materials	

Options	Order code
Reserved for 7MF7: without process flanges, without screws, without gaskets	**K00**
Process flange material alloy C22/2.4602	**K01**
Process flange material Monel 400/2.4360	**K02**
Process connection material PVDF, on the side ½-14 NPT	**K05**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 25 PN 40, MAWP 4 bar	**K06**
Process flanges/process connection material PVDF, flange on the side EN 1092-1 Form B1 DN 40 PN 40, MAWP 4 bar	**K07**
Process flanges; process connection option	
Process flange with process connection G½ welded on	**K20**
Process connection NAM (ASTAVA)	**K21**
Process flanges chambered with gaskets	
1x chambered, graphite	**K40**
1x chambered, PTFE	**K41**
2x chambered, PTFE	**K42**
Process flanges, gaskets (instead of standard gaskets FKM (FPM))	
O-ring, process flanges, PTFE	**K50**
O-ring, process flanges, FEP (with silicone core, approved for food)	**K51**
O-ring, process flanges, FFKM (FFPM)	**K52**
O-ring, process flanges, NBR	**K53**
O-ring, process flanges, EPDM	**K54**
Process flange options	
Process flanges for vertical differential pressure lines (half process flange)	**K81**
Process flanges (+) - side front	**K82**
Process flange screws, process flange nuts, material Monel 400/2.4360	**K83**
Valve ¼-18 NPT, material same as process flanges	**K84**
Valve mounted on the side, measured medium: Gas	**K85**
Oval flange attached, PTFE seal + fastening screws	**K86**
Valve manifolds	
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U01**
With mounted valve manifold (3-way) 7MF9411-5BA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U02**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, chrome-plated steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U03**
With mounted valve manifold (5-way) 7MF9411-5CA, PTFE sealing rings, stainless steel screws and pressure test certified in factory certificate (EN 10204-2.2)	**U04**

Options	Order code
Device settings	
Measuring span Lower range value (max. 5 characters), Upper range value (max. 5 characters), unit [mbar, bar, kPa, MPa, psi, ...], example: -0.5 ... 10.5 psi Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: Pa, MPa, kPa, hPa, bar, mbar, psi, g/cm^2, kg/cm^2, kgf/cm^2, inH_2O, inH_2O (4°C), ftH_2O, mmH_2O, mmH_2O (4°C), mH_2O (4°C), mmHg, inHg, atm, torr	**Y01**
TAG (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y15**
Measuring point description (on stainless steel plate and device parameters, max. 32 characters) Input field: Free text, max. 32 characters	**Y16**
TAG short (device parameters, max. 8 characters) Input field: Free text, max. 8 characters	**Y17**
Local display [Pressure, Percent], reference [None, Absolute, Gauge], example: Pressure gauge Drop-down list: Percent, pressure unit, pressure unit abs., pressure unit gauge	**Y21**
Local display Scaling with standard units [m^3/s, l/s, m, inch, ...], example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Drop-down list: m, cm, mm, in, ft, m^3, l, hl, in^3, ft^3, yd^3, gal, gal (UK), bu, bbl, bbl (US), SCF, Nm^3, Nl.	**Y22**
Local display Scaling with user-specific units (max. 12 characters), example 1 ... 5 m Input field 1 and input field 2: max. 5 characters and numbers only; decimal places as dot (comma is automatically converted to dot). Input field 3: Free text, max. 8 characters	**Y23**
Saturation limits instead of 3.8 ... 20.5 mA, example: 3.8 ... 22.0 mA Drop-down list 1: 3.9, 4 Drop-down list 2: 20.8, 22	**Y30**
Fault current instead of 3.6 mA [22.5 mA, 22.8 mA] Drop-down list: 3.75; 21.75; 22.5; 22.6	**Y31**
Damping in seconds instead of 2 s (0.0 ... 100.0 s) Input field: max. 4 characters and numbers only; decimal places as dot (comma is automatically converted to dot); min. value = 0; max. value = 100.	**Y32**
ID number of special design Input field: max. 4 characters and only natural numbers from 0 … 9999	**Y99**

Dimensional drawings



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

S.K.I. Schlegel & Kremer Industrieautomation GmbH

Postfach 41 01 31
D 41241 Mönchengladbach
Hanns-Martin-Schleyer-Str. 22
D 41199 Mönchengladbach

Telefon: +49 (0)2166-62317-0
Web: www.ski-gmbh.com
e-mail: info@ski-gmbh.com