



CCA-P-331Pi

- precision pressure transmitter
- nominal pressure: from 0...400 mbar up to 0...40 bar
- output signals: 2-wire: 4...20 mA; 3-wire: 0...10 V
- flush welded stainless steel diaphragm
- accuracy 0.1 % span
- excellent temperature response 0.04 % span / 10K
- turn-down 10:1
- processing of the sensor signal using digital electronics
- process connections suitable for hygienic application
- certified for contact with drinking water by the Polish National Institute of Public Health (PZH) - EPDM version

The precision pressure transmitter **CCA-P-331Pi** demonstrates the further development of well-tried industrial pressure transmitter CCA-P-331P. The signal from the specially designed piezoresistive stainless steel sensor is processed by the newly developed digital electronic system, performing thus an active compensation of sensor specific deviations such as hysteresis, thermal errors and non-linearity. The temperature range of -40 ... 125 °C can be extended by the integration of a cooling element up to 300°C.

PREFERRED AREAS OF USE ARE



Laboratory techniques



Food and Beverage



Pharmaceutical Industry

TECHNICAL DATA

Pressure ranges ¹

Nominal pressure gauge / absolute ²	[bar]	0.4	1	2	4	10	20	40
Overpressure	[bar]	2	5	10	20	40	80	105
Burst pressure ≥	[bar]	3	7.5	15	25	50	120	210
Vacuum resistance	$P_N \geq 1$ bar: unlimited vacuum resistance $P_N < 1$ bar: on request							

¹ On customer request we adjust the device within the turn-down-possibility by software on the required pressure range.

² absolut pressure permissible from 1 bar

Vacuum ranges

Nominal pressure *	[bar]	-0.4 ... 0.4	-1 ... 1	-1 ... 2	-1 ... 4	-1 ... 10
Overpressure	[bar]	2	5	10	20	40
Burst pressure ≥	[bar]	3	7.5	15	25	50

*for 0 ... 1 bar abs. or -1 ... 0 bar gauge max. temperature 70°C

Output signal / Supply

Standard	2-wire: 4 ... 20 mA / $V_S = 12 ... 36 V_{DC}$
Options	2-wire: 4 ... 20 mA with communication interface ³ 3-wire: 0 ... 10 V / $V_S = 14 ... 36 V_{DC}$ 0 ... 10 V with communication interface ³

³ only possible with el. connection Binder series 723 (7-pin)

Performance

Accuracy ⁴ performance after turn-down - TD ≤ 5:1 - TD > 5:1	IEC 60770: $\leq \pm 0.1$ % span no change of accuracy ⁵ for calculation use the following formula (for nominal pressure ranges ≤ 0.40 bar see note 5): $\leq \pm [0.1 + 0.015 \times \text{turn-down}]$ % span with turn-down = nominal pressure range / adjusted range e.g. with a turn-down of 10:1 following accuracy is calculated: $\leq \pm (0.1 + 0.015 \times 10)$ % span i.e. accuracy is $\leq \pm 0.25$ % span
Permissible load	current 2-wire: $R_{max} = [(V_S - V_{S \min}) / 0.02 A] \Omega$ voltage 3-wire: $R_{min} = 10 k\Omega$
Influence effects	supply: 0.05 % span / 10 V load: 0.05 % span / kΩ
Long term stability	$\leq \pm (0.1 \times \text{turn-down})$ % span / year
Response time	current 2-wire: approx 5ms voltage 3-wire: 25 ms
Adjustability	configuration of following parameters possible (interface / software necessary ⁶): - electronic damping: 0 ... 100 sec - offset: 0 ... 90 % span - turn down of span: max. 10:1

⁴ accuracy according to EN IEC 62828-2- limit point adjustment (non-linearity, hysteresis, repeatability)

⁵ except nominal pressure ranges ≤ 0.40 bar; for these calculation of accuracy is as follows:

$\leq \pm (0.1 + 0.02 \times \text{turn-down})$ % span e.g. turn-down of 3:1: $\leq \pm (0.1 + 0.02 \times 3)$ % span i.e. accuracy is $\leq \pm 0.16$ % span

⁶ software, interface, and cable have to be ordered separately (software appropriate for Windows® 95, 98, 2000, NT Version 4.0 or higher, and XP)

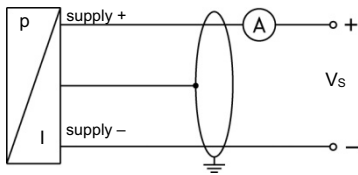
Thermal effects ⁷ (Offset and Span) / Permissible temperatures			
Tolerance band [% span]	≤ ± (0.35 x turn-down)	in compensated range	0 ... 80 °C
TC, average [% span / 10 K]	≤ ± (0.035 x turn-down)	in compensated range	0 ... 80 °C
Permissible temperatures	medium ⁸ :	-40 ... 125 °C for filling fluid silicon oil	
		-10 ... 125 °C for filling fluid food compatible oil	
	electronics / environment: storage:	-25 ... 85 °C -40 ... 100 °C	
Permissible temperature medium for cooling element ⁹	filling fluid silicon oil	overpressure: -40 ... 300 °C	vacuum: -40 ... 150 °C ¹⁰
	filling fluid food compatible oil	overpressure: -10 ... 250 °C	vacuum: -10 ... 150 °C ¹⁰
⁷ an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions.			
⁸ max. temperature of the medium for nominal pressure gauge > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °C			
⁹ max. temperature depends on the used sealing material, type of seal and installation			
¹⁰ also for P _{abs} ≤ 1 bar			
Electrical protection			
Short-circuit protection	permanent		
Reverse polarity protection	no damage, but also no function		
Electromagnetic compatibility	emission and immunity according to EN 61326		
Filling fluids			
Standard	silicon oil		
Options	food compatible oil with FDA approval (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500) others on request		
Mechanical stability			
Vibration (DIN EN 60068-2-6)	G 1/2": 20 g RMS (25 ... 2000 Hz); others except G 1/2": 10 g RMS (25 ... 2000 Hz)		
Shock (DIN EN 60068-2-27)	G 1/2": 500 g / 1 msec; others except G 1/2": 100 g / 1 msec		
Materials			
Pressure port	stainless steel 1.4404 (316 L) others on request		
Housing	stainless steel 1.4404 (316 L)		
Option field housing	stainless steel 1.4301 (304), cable gland M16x 1.5 brass, nickel plated (clamping range 2....8 mm)		
Seals (O-ring)	standard: FKM (recommended for medium temperatures ≤ 200 °C) option: FFKM (recommended for medium temperatures < 260 °C) EPDM (with drinking water certificate) others on request clamp and dairy pipe: without		
Diaphragm	standard: stainless steel 1.4435 (316L) option: Hastelloy® C-276 (2.4819) and Tantalum on request		
Media wetted parts	pressure port, diaphragm		
Miscellaneous			
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA		
EHEDG certificate Type EL Class I	EHEDG conformity is only ensured in combination with an approved seal. This is e.g. for - Clamp (C61, C62, C63): T-ring-seal from Combifit International B.V. - Varivent® (P41): EPDM-O-ring which is FDA-listed - dairy pipe (M73, M75, M76): ASEPTO-STAR k-flex upgrade seal by Kieselmann GmbH		
Surface roughness	pressure port Ra < 0.8 µm (media wetted parts) diaphragm Ra < 0.15 µm weld seam Ra < 0.8 µm		
Weight	approx. 200 g		
Installation position	any ¹¹		
Operational life	100 million load cycles		
CE-conformity	EMC Directive: 2014/30/EU		
¹¹ Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges P _N ≤1 bar.			



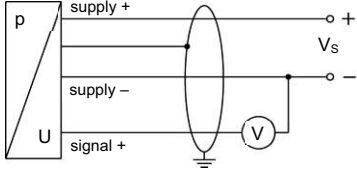
ELECTRICAL CONNECTION

Wiring diagrams

2-wire-system (current)



3-wire-system (voltage)



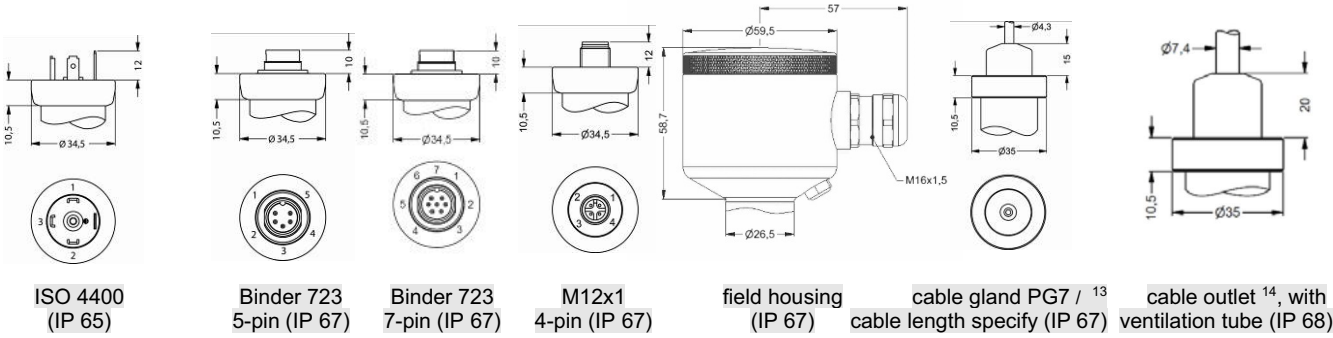
Pin configuration

Electrical connections	ISO 4400	Binder 723 (5-pin)	Binder 723/423 (7-pin)	M12x1/ metal (4-pin)	field housing	cable colours (IEC 60757)
Supply +	1	3	3	1	IN +	wh (white)
Supply -	2	4	1	2	IN -	bn (brown)
Signal + (only for 3-wire)	3	1	6	3	OUT +	gr (green)
shield	ground pin $\oplus$	5	2	4	$\oplus$	ye/gn yellow / green
Communication in- terface ¹²						
RxD	-	-	4	-	-	-
TxD	-	-	5	-	-	-
GND	-	-	7	-	-	-

¹² may not be connected directly with the PC (the suitable adapter is available as accessory)

standard

options

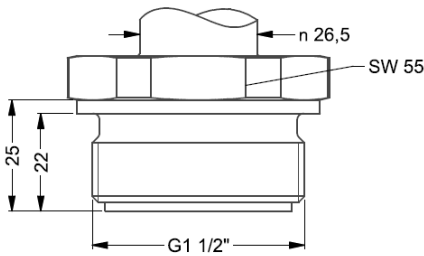


¹³ standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)

¹⁴ different cable types and lengths available, permissible temperature depends on kind of cable

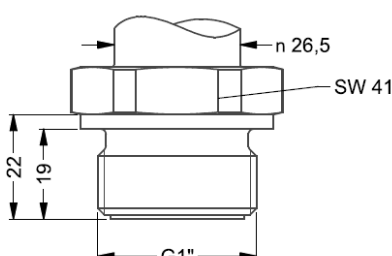
DIMENSION DRAWINGS

standard

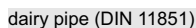


G1/2" flush DIN 3852

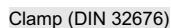
option



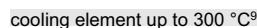
G1" flush DIN 3852



dimensions in mm



dimensions in mm



⇒ metric threads and others on request

ORDER CODECCA-P-331Pi- - - - -

Pressure transmitters

CCA-P-331Pi- - - - -

Mechanical connection									
G 1/2" DIN 3852 ($P_N > 2,5$ bar) (only with seals) ⁴	Z	0	0						
M 20 x 1,5 DIN 3852 ($P_N > 2,5$ bar) (only with seals)	D	0	4						
G 3/4" DIN 3852 ($P_N > 0,6$ bar) (only with seals)	Z	3	0						
G 1" DIN 3852 ($P_N > 0,25$ bar) (only with seals)	Z	3	1						
G 1 1/2" DIN 3852 (only with seals)	Z	3	3						
G 2" DIN 3852	Z	3	4						
G 1" DIN 3852 flush 2x O ring ($P_N > 0,25$ bar)	Z	5	7						
G 1/2" DIN 3852 flush 2x O ring ($P_N > 1$ bar)	Z	6	1						
G 3/4" DIN 3852 flush 2x O ring ($P_N > 1$ bar)	Z	6	6						
1/8" - 27 NPT (without seals, monel pressure port, tantal membrane)	Z	9	2						
G1" cone seal (without seals)	K	3	1						
Clamp DN 3/4" (4 bar < P_N < 8 bar) (without seals)	C	6	8						
Clamp DN 1" (DN 25) (0,4 bar < P_N < 16 bar) (without seals)	C	6	1						
Clamp DN 1 1/2" (DN 32) (0,4 bar < P_N < 16 bar) (without seals)	C	6	2						
Clamp DN 2" (DN 50) (0,4 bar < P_N < 16 bar) (without seals)	C	6	3						
DIN 11851 DN 25 ($P_N > 0,6$ bar) (without seals) ³	M	7	3						
DIN 11851 DN 40 ($P_N > 0,4$ bar) (without seals) ³	M	7	5						
DIN 11851 DN 50 ($P_N > 0,25$ bar) (without seals) ³	M	7	6						
"sandwich" DN 25 (without seals)	S	6	1						
"sandwich" DN 50 (without seals)	S	7	6						
"sandwich" DIN 2501 DN 80 (without seals)	S	8	0						
M 22 x 1,5 DIN 3852 ($P_N > 2,5$ bar) (only with seals)	D	1	5						
Flange DN 25/PN 40 DIN 2501 (without seals)	F	2	0						
Flange DN 40/PN 40 DIN 2501 (without seals)	F	2	2						
Flange DN 50/PN 40 DIN 2501 (without seals)	F	2	3						
Flange DN 80/PN 16 DIN 2501 (without seals)	F	1	4						
Flange DN 100/PN 16 DIN 2501 (without seals)	F	2	5						
Varivent ® DN 40/50 (without seals)	P	4	1						
Customer	9	9	9						
Diaphragm									
Stainless steel 1.4435 (316 L)			1						
Hastelloy ® C-276			H						
Tantalum			T						
Customer			9						
Seals									
Without seals (Clamp, dairy pipe DIN, sandwich, flange, varivent)			0						
Viton (FKM)			1						
FFKM			7						
EPDM ⁶			3						
Customer			9						
Filling Fluids									
Silicone oil			1						
Edible oil for foodstuff industry (temperature max. 150°C)			2						
Halocarbon			C						
Customer			9						
Special version									
Standard				1	1	1			
Communication RS 232 ⁵				1	2	1			
With cooling element for temp. up to 150°C				1	6	1			
With cooling element for temp. up to 300°C ($P_N \leq 70$ bar max. 200°C permanent)				2	1	1			
Communication RS 232 with cooling element (up to 300°C $P_N \leq 70$ bar max. 200°C) ⁵				2	2	1			
Customer				9	9	9			

- 1 - absolute pressure possible from 1 bar
- 2 - cable with ventilation tube (code TR0 = PVC cable), different cable types and lengths available
- 3 - the cup nut has to be mounted by production of pressure transmitter with electrical connection field housing and mechanical connection dairy pipe.
The cup nut has to be ordered as separate position.
- 4 - possible only for $P_N \geq 1$ bar
- 5 - RS-232 interface only possible with electrical connection Binder series 723/423 (7-pin)
- 6 - drinking water certification only possible with EPDM seal

Software, Interface and cable for CCA-P-331Pi with option RS-232 have to be order separately
(Ordering code: CIS-G; Software appropriate for Windows® 95, 98, 2000, NT Version 4.0 or newer and XP)

!!! When you make an order it is necessary to fill the questionnaire for transmitter with separators!!!

The manufacturer reserves the right to change sensor specifications without prior notice.

