



CCA-P-331i / CCA-P-333i / CPA-P-331i

- precision pressure transmitter / screw-in level transmitter
- nominal pressure: from 0...400 mbar up to 0...600 bar
- output signals: 2-wire: 4...20 mA; 3-wire: 0...10 V (for CCA/CPA-P-331i)
- stainless steel sensor
- accuracy 0.1 % span
- thermal error in compensated range -20...80°C: 0.2 % span
- turn down 10:1
- communication interface for adjusting of offset, span and damping
- certified for contact with drinking water by the Polish National Institute of Public Health (PZH) - EPDM version

The precision pressure transmitter **CCA-P-331i** and **CCA-P-333i** as well as the precision screw-in level probe **CPA-P-331i** demonstrate the further development of our industrial pressure transmitters. The signal of the sensor is processed by the intelligent digital electronics with 16-bit A/D converter which is able to do an active temperature compensation and linearization. Due to this we are able to offer the transmitters with excellent measurement parameters and exceptionally attractive price.

PREFERRED AREAS OF USE ARE

for CCA-P-331i / CCA-P-333i



Laboratory Techniques



Energy production (gas consumption and thermal energy measurement)

for CPA-P-331i



Chemical / petrochemical industry



Environmental Engineering
(water / sewage / recycling)

TECHNICAL DATA

Pressure ranges CCA-P-331i ¹

Nominal pressure gauge / absolute	[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

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

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

Pressure ranges CCA-P-333i ¹

Nominal pressure gauge / absolute	[bar]	60	100	200	400	600
Overpressure	[bar]	210	210	600	1000	1000
Burst pressure	[bar]	420	420	1000	1250	1250

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

Pressure ranges CPA-P-331i ¹

Nominal pressure gauge	[bar]	0.4	1	2	4	10	20	40
Level gauge	[mH ₂ O]	4	10	20	40	100	200	400
Overpressure	[bar]	2	5	10	20	40	80	105
Burst pressure	[bar]	3	7.5	15	25	80	120	210

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

Output signal / Supply

Standard	2-wire: 4 ... 20 mA / V _S = 12 ... 36 V _{DC}
Options analog signal	2-wire: 4 ... 20 mA with communication interface ² 3-wire*: 0 ... 10 V / V _S = 14 ... 36 V _{DC} 0 ... 10 V with communication interface ²

* only for CCA-P-331i and CPA-P-331i

² only possible with el. connection Binder series 723 (7-pin)

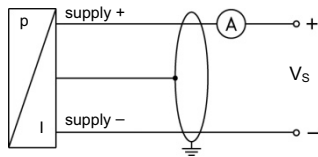
Performance	
Accuracy performance after turn-down - TD ≤ 5:1 - TD > 5:1	IEC 60770 ³ : ≤ ± 0.1 % span no change of accuracy ⁴ for calculation use the following formula (for nominal pressure ranges ≤ 0.40 bar see note 5): ≤ ± [0.1 + 0.015 x turn-down] % span with turn-down = nominal pressure range / adjusted range e.g. with a turn-down of 10:1 following accuracy is calculated: ≤ ± (0.1 + 0.015 x 10) % span i.e. accuracy is ≤ ± 0.25 % span
Permissible load	current 2-wire: $R_{max} = [(V_S - V_S \text{ min}) / 0.02 \text{ A}] \text{ W}$ voltage 3-wire: $R_{min} = 10 \text{ kW}$
Influence effects	supply: 0.05 % span / 10 V load: 0.05 % span / kW
Long term stability	≤ ± (0.1 x turn-down) % span / year
Response time	current output 4...20 mA (2-wire) 5ms voltage output 0...10 V 25 ms
Adjustability	configuration of following parameters possible (interface / software necessary ⁵): - electronic damping: 0 ... 100 sec - offset: 0 ... 90 % span - turn down of span: max. 10:1
³ accuracy according to EN IEC 62828-2— limit point adjustment (non-linearity, hysteresis, repeatability)	
⁴ except nominal pressure ranges ≤ 0.40 bar; for these calculation of accuracy is as follows: ≤ ± (0.1 + 0.02 x turn-down) % span e.g. turn-down of 3:1: ≤ ± (0.1 + 0.02 x 3) % span i.e. accuracy is ≤ ± 0.16 % span	
⁵ 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 (Offset and Span) / Permissible temperatures	
Tolerance band [% span]	≤ ± (0.2 x turn-down) in compensated range -20 ... 80 °C
TC, average [% span / 10 K]	± (0.02 x turn-down) in compensated range -20 ... 80 °C
Permissible temperatures	medium: -25 ... 125 °C electronics / environment: -25 ... 85 °C storage: -40 ... 100 °C
Electrical protection	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function
Electromagnetic compatibility	emission and immunity according to EN 61326
Materials	
Pressure port	stainless steel 1.4404 (316 L)
Housing	stainless steel 1.4404 (316 L)
Option field housing	stainless steel 1.4301 (304); cable gland M16x1.5, brass, nickel plated (clamping range 2 ... 8 mm)
Seals	CCA-P-331i / CPA-P-331i: FKM / EPDM (with drinking water certificate) CCA-P-333i: FKM / EPDM (with drinking water certificate) / NBR optional: welded version ⁶ others on request
Diaphragm	stainless steel 1.4435 (316L)
Media wetted parts	pressure port, seals, diaphragm
⁶ welded version only with pressure ports according to EN 837; welded version not available with pressure ranges ≤ 0.16 bar and > 40 bar	
Mechanical stability	
Vibration	10 g RMS (20 ... 2000 Hz) according to DIN EN 60068-2-6
Shock	100 g / 11 msec according to DIN EN 60068-2-27
Miscellaneous	
Current consumption	signal output current: max. 25 mA signal output voltage: max. 7 mA
Weight	approx. 200 g
Installation position	any ⁷
Operational life	100 million load cycles
CE-conformity	EMC Directive: 2014/30/EU Pressure Equipment Directive: 2014/68/EU (module A) ⁸
⁷ 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 $P_N \leq 1 \text{ bar}$.	
⁸ This directive is only valid for devices with maximum permissible overpressure > 200 bar	



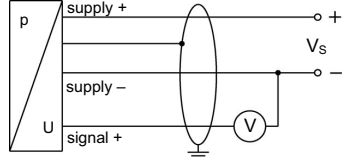
ELECTRICAL CONNECTION

Wiring diagrams

2-wire-system (current)



3-wire-system (voltage)



Pin configuration

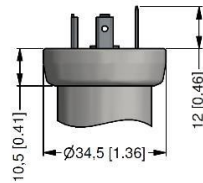
Electrical connections	ISO 4400	Binder 723 (5-pin)	Binder 723/423 (7-pin)	M12x1/ metal (4-pin)	field housing	Bayonet MIL-C-26482 (10-6)		cable colours (DIN 47100)
supply + supply - signal + (only for 3-wire)	1 2 3	3 4 1	3 1 6	1 2 3	Vs + Vs - S +	A B -	A D B	wh (white) bn (brown) gn (green)
shield	ground pin	5	2	4	GND	pressure port		gn/ye (green/yellow)
Communication interface ⁹	RxD TxD GND	- - -	4 5 7	- - -	- - -	- - -	- - -	- - -

⁹ may not be transmitted directly with the PC (the suitable adapter is available as accessory)

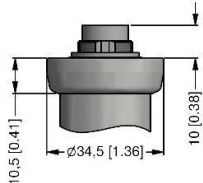
Electrical connections (dimensions in mm)

standard

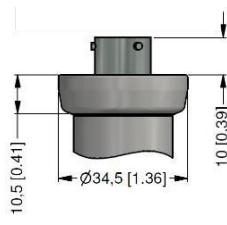
option



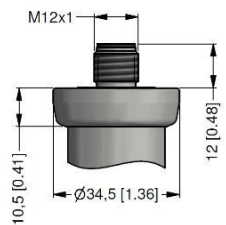
ISO 4400 (IP 65)



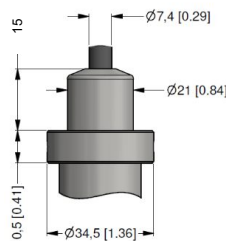
Binder Series 723 5-pin (IP 67)



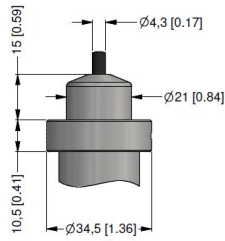
Binder Series 723 7-pin (IP 67)



M12x1 4-pin (IP 67)



cable outlet with ventilation tube (IP 68) ¹⁰



cable gland PG7/cable length specify (IP 67) ¹¹



field housing (IP 67)

¹⁰ different cable types and lengths available, permissible temperature depends on kind of cable

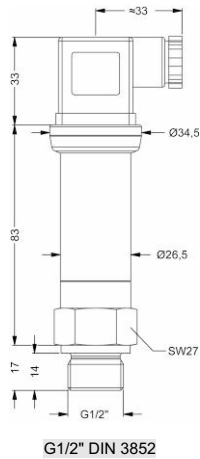
¹¹ standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)



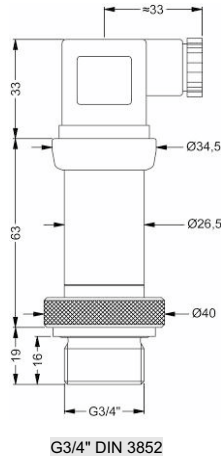
DIMENSION DRAWINGS

standard

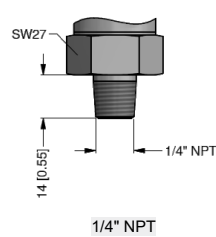
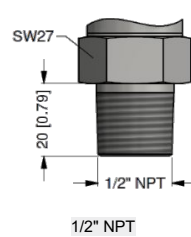
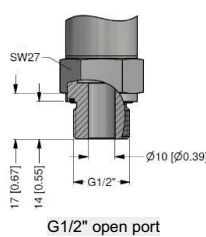
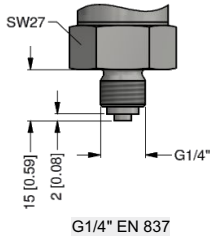
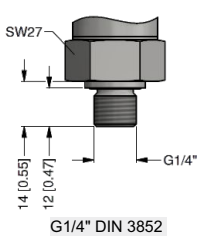
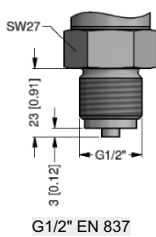
CCA-P-331i / CCA-P-333i *



CPA-P-331i



option for CCA-P-331i and CCA-P-333i



⇒ metric threads and others on request

ACCESSORIES

Programming kits for i-devices: CIS 510-RS232 and CIS 510-USB

CIS 510-RS232



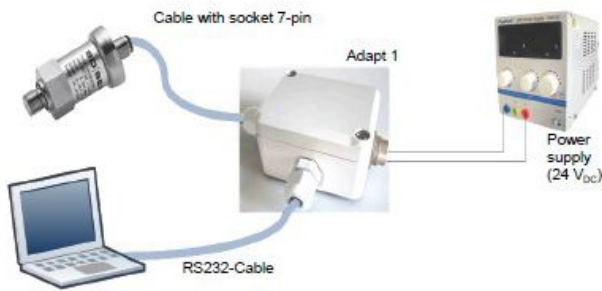
CIS 510-USB



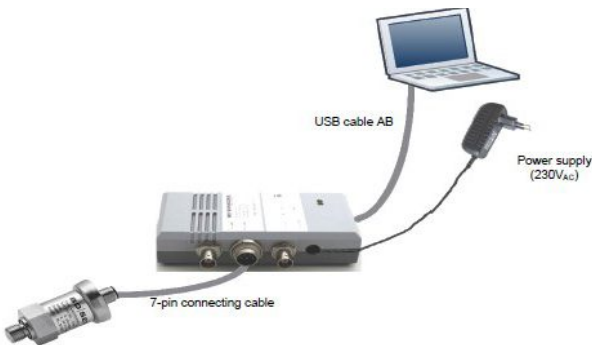
Supply V _s	for CIS 510-RS232: 24V _{DC} for CIS 510-USB: 24V _{DC}
Package contents	Programming software "Config 3.0" on CD operating manual CIS 510-RS232: Adapt 1 RS-232 connecting cable (for PC) 7-pin connecting cable (for measuring device) CIS 510-USB: Adapt 5 USB connecting cable (for PC) 7-pin connecting cable (for measuring device)
System requirement	For the installation of the software, a Windows® PC (95, 98, ME, 2000, NT, XP) with serial interface (RS 232) or USB-interface is required
Please read the operating manual carefully before installing and starting up the programming kit.	

Wiring diagrams

CIS 510-RS232:



CIS 510-USB interface:



Ordering codes

Version:

Adapt 1 with RS232 connecting cable for PC

Adapt 5 with USB connecting cable for PC

Ordering code:

CIS 510-RS232

CIS 510-USB

Windows® is a registered trade mark of Microsoft Corporation

ORDER CODE for CCA-P-331i

CCA-P-331i- - - - -														
Pressure														
Gauge (0,4...40 bar)			1	1	0									
Absolute (0,4...40 bar)			1	1	1									
Input [bar]														
0 ... 0,4						4	0	0	0					
0 ... 1						1	0	0	1					
0 ... 2						2	0	0	1					
0 ... 4						4	0	0	1					
0 ... 10						1	0	0	2					
0 ... 20						2	0	0	2					
0 ... 40						4	0	0	2					
-0,4 ... 0,4						S	4	0	0					
-1 ... 1						S	1	0	2					
-1 ... 2						V	2	0	2					
-1 ... 4						V	4	0	2					
-1 ... 10						V	1	0	3					
Customer						9	9	9	9					
Customer - underpressure						X	X	X	X					
Output														
4...20 mA / 2-wire										1				
0...10 V / 3-wire										3				
Customer										9				
Accuracy														
0,1 % - standard range										1				
0,1 % - standard range including Calibration Certificate										P				
0,1 % - customer range										I				
0,1 % - customer range including Calibration Certificate										H				
0,2 % (P _N < 0,1 bar)										B				
0,2 % (P _N < 0,1 bar) including Calibration Certificate										Q				
Customer										9				

Pressure / level transmitters

CCA-P-331i- - - -

Electrical connection									
Connector DIN 43650 (ISO 4400) (IP 65)	1	0	0						
Connector Binder 723 5-pin (IP 67)	2	0	0						
Cable gland PG7 / cable length specify (IP 67)	4	0	0						
+ PVC cable / 1 m									
Connector Buccaneer (IP 68)	5	0	0						
Field housing stainless steel, cable gland M 16 x 1,5 (IP 67)	8	0	0						
Field housing stainless steel, cable gland M 20 x 1,5 (IP 67)	8	8	0						
Connector Binder 723 and 423 7-pin (IP 67) (for Interface RS 232)	A	0	0						
Connector DIN 43650 (ISO 4400) - potting compound inside (IP 67)	E	0	0						
Connector M12 x 1, 4-pin (IP 67)	M	0	0						
Connector M12 x 1, 4-pin (IP 67) - metal	M	1	0						
Cable outlet, cable with ventilation tube (IP68) ¹	T	R	0						
+ PVC cable / 1 m									
Customer	9	9	9						
Mechanical connection									
G 1/2" DIN 3852		1	0	0					
G 1/2" EN 837		2	0	0					
G 1/4" DIN 3852		3	0	0					
G 1/4" EN 837		4	0	0					
M 20 x 1,5 DIN 3852		5	0	0					
M 12 x 1 DIN 3852		6	0	0					
M 10 x 1 DIN 3852		7	0	0					
M 20 x 1,5 EN 837		8	0	0					
1/2" NPT		N	0	0					
1/4" NPT		N	4	0					
Customer		9	9	9					
Seals									
Viton (FKM)							1		
Without seals - welded (only with EN 837-1/-3) ^{2, 3}							2		
EPDM ⁵							3		
Viton (FKM) up to -40°C							F		
Customer							9		
Special version									
Standard							1	1	1
Temperature compensation -30 ... 80°C (only with seals "F" or welded "2")							1	1	2
Interface RS 232 (only for connector Binder 723/423 7-pin) ⁴							1	2	1
Customer							9	9	9
Software									
Communication module Adapt 6 (RS 232 / USB for CCA-P-331i/333i) + software									CIS-G
Software for CCA-P-331i/333i / Update									503498
Communication module Adapt 1 with RS232 connecting cable for PC									CIS 510-RS232
Communication module Adapt 5 with USB connecting cable for PC									CIS 510-USB

1 - code TR0 = PVC cable, cable with ventilation tube available in different types and lengths; cable not included in the price

2 - only possible for CCA-P-331i and $P_N \leq 40$ bar

3 - welded version only with pressure ports according to EN 837

4 - communication interface RS-232 only possible with el. connection Binder serie 723/423 (7pin)

Software, Interface and cable for CCA-P-331i 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)

Windows® is a registered trademark of Microsoft Corporation

5 - drinking water certification only possible with EPDM seal

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



Pressure / level transmitters

ORDER CODE for CCA-P-333i

CCA-P-333i- - - - -

Pressure									
Gauge ¹	1	3	0						
Absolute	1	3	1						
Input [bar]									
0 ... 60				6	0	0	2		
0 ... 100 ²				1	0	0	3		
0 ... 200 ²				2	0	0	3		
0 ... 400 ²				4	0	0	3		
0 ... 600 ²				6	0	0	3		
Customer				9	9	9			
Output									
4...20 mA / 2-wire							1		
Customer							9		
Accuracy									
0,1 % - standard range							1		
0,1 % - standard range including Calibration Certificate							P		
0,1 % - customer range							I		
0,1 % - customer range including Calibration Certificate							H		
0,2 % (P _N < 0,1 bar)							B		
Customer							9		
Electrical connection									
Connector DIN 43650 (ISO 4400) (IP 65)							1	0	0
Connector Binder 723 5-pin (IP 67)							2	0	0
Cable gland PG7 / cable length specify (IP 67)							4	0	0
+ PVC cable / 1 m									
Connector Buccaneer (IP 68)							5	0	0
Field housing stainless steel, cable gland M 16 x 1,5 (IP 67)							8	0	0
Field housing stainless steel, cable gland M 20 x 1,5 (IP 67)							8	8	0
Connector Binder 723 and 423 7-pin (IP 67) (for Interface RS 232)							A	0	0
Connector DIN 43650 (ISO 4400) - potting compound inside (IP 67)							E	0	0
Connector M12 x 1, 4-pin (IP 67)							M	0	0
Connector M12 x 1, 4-pin (IP 67) - metal							M	1	0
Cable outlet, cable with ventilation tube (IP 68) ³							T	R	0
+ PVC cable / 1 m									
Customer							9	9	9
Mechanical connection									
G 1/2" DIN 3852							1	0	0
G 1/2" EN 837							2	0	0
G 1/4" DIN 3852							3	0	0
G 1/4" EN 837							4	0	0
M 20 x 1,5 DIN 3852							5	0	0
M 12 x 1 DIN 3852							6	0	0
M 10 x 1 DIN 3852							7	0	0
M 20 x 1,5 EN 837							8	0	0
G1/2" DIN 3852 open pressure port							H	0	0
1/2" NPT							N	0	0
1/4" NPT							N	4	0
Customer							9	9	9
Seals									
Viton (FKM)								1	
EPDM ⁵ (P _N < 160 bar)								3	
NBR (standard)								5	
Customer								9	
Special version									
Standard								1	1
Interface RS 232 (only for connector Binder 723/423 7-pin) ⁴								1	2
Customer								9	9
Software									
Communication module Adapt 6 (RS 232 / USB for CCA-P-331i/333i) + software									CIS-G
Software for CCA-P-331i/333i / Update									503498
Communication module Adapt 1 with RS232 connecting cable for PC									CIS 510-RS232
Communication module Adapt 5 with USB connecting cable for PC									CIS 510-USB

- 1 - measurement starts with ambient pressure
- 2 - pressure ranges > 60 bar as CCA-P-333i
- 3 - code TR0 = PVC cable, cable with ventilation tube available in different types and lengths; cable not included in the price
- 4 - communication interface RS-232 only possible with el. connection Binder serie 723/423 (7pin)
Software, Interface and cable for CCA-P-333i with option RS-232 have to be order separately
(Software appropriate for Windows® 95, 98, 2000, NT Version 4.0 or newer and XP)
Windows® is a registered trademark of Microsoft Corporation
- 5 - drinking water certification only possible with EPDM seal

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



ORDER CODE 101-07471-0021

1. 2000-1995: 1.7% cuts; cuts with exemption rate increases in exempt types and regions; cuts not included in the price

2. Induktionsannahme (Induktionshypothese) $\forall n \in \mathbb{N} : 1 + 2 + \dots + n = \frac{n(n+1)}{2}$

3. Drinking water: continuation only possible with 21.2m coal

0 0.5 1 1.5 2 2.5 3 3.5 4 4.5 5 5.5 6 6.5 7 7.5 8 8.5 9 9.5 10

