BD SENSORS®
pressure measurement

DMP 331i / DMP333i
LMP 331 i

Precision Pressure Transmitter / Screw-in transmitter

Stainless Steel Sensor

accuracy according to EN IEC 62828-2:
0.1 % span

Nominal pressure

from 0 ... 400 mbar up to 0 ... 600 bar

Output signal

2-wire: 4 ... 20 mA
3-wire: 0 … 10 V (only for DMP 331i and LMP 331i)
others on request

Product characteristics

- thermal error in compensated range -20 ... 80 °C: 0.2 % span
  TC 0.02 % span / 10K
- turn:down 10:1
- communication interface for adjusting of offset, span and damping

Optional versions

- IS-versions
  Ex ia = intrinsically safe for gases and dusts
- adjustment of nominal pressure gauges (factory-provided)

The precision pressure transmitter DMP 331i and DMP 333i as well as the precision screw-in level probe LMP 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 DMP 331i / DMP 333i

- Laboratory Techniques
- Energy production (gas consumption and thermal energy measurement)

Preferred areas of use are LMP 331i

- Chemical / petrochemical industry
- Environmental Engineering (water / sewage / recycling)

BD SENSORS s.r.o.
Hradišťská 817
CZ – 687 08 Buchlovice
Tel.: +420 572 411 011
www.bdsensors.cz
info@bdsensors.cz

Pressure ranges DMP 331 i [1]								
Nominal pressure gauge / absolute	[bar] [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 DMP 333 i [1]						
Nominal pressure gauge / absolute	[bar] [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 LMP 331 i [1]								
Nominal pressure gauge	[bar]	0.4	1	2	4	10	20	40
Level gauge	[mH_2O]	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}
Option Exi, MINES – M1	2-wire: 4 ... 20 mA / V_S = 14 ... 28 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 DMP 331i and LMP 331i*	
[2] only possible with el. connection Binder series 723 (7-pin)	
Performance	
Accuracy[3] performance after turn-down - TD ≤ 5:1 - TD > 5:1	≤ ± 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 min) / 0.02 A] Ω voltage 3-wire: R_{min} = 10 kΩ
Influence effects	supply: 0.05 % span / 10 V load: 0.05 % span / kΩ
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	Standard product: medium: -25 ... 125 °C / electronics / environment:-25 ... 85 °C / storage: -40 ... 100 °C* Exi: in zone 0: -20 ... 60 °C with p_{atm} 0,8 bar up to 1,1 bar in zone 1 or higher: -20 ... 65 °C Ex (MINES - M1): Medium: -20…70 °C / transmitter: -20…65 °C / storage: -25…70 °C
Electrical protection	
Short-circuit protection	permanent
Reverse polarity protection	no damage, but also no function

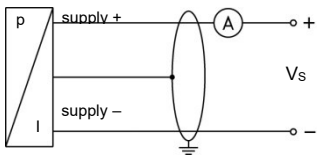
Electromagnetic compatibility	emission and immunity according to EN 61326

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	DMP 331i / LMP 331i: FKM DMP 333i: 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
Explosion protection (only for 4 ... 20 mA / 2-wire)	
Approvals DX9-DMP 331i DX9-DMP 333i DX9-LMP 331i	**IBExU10ATEX1122 X** zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T135°C Da
Approvals IBExU13ATEX1043X	I M1 Ex ia I Ma (MINES - M1)
Safety technical max. values	U_i = 28 V, I_i = 93 mA, P_i = 660 mW, $C_i \approx 0$ nF, $L_i \approx 0$ µH, the supply connections have an inner capacity of max. 27 nF to the housing
Connecting cables (by factory)	cable capacitance: signal line/shield also signal line/signal line: 160 pF/m cable inductance:signal line/shield also signal line/signal line: 1µH/m
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]
ATEX Directive	2014/34/EU

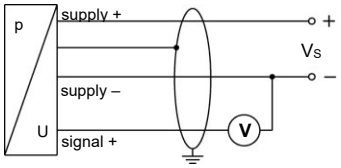
[7] Pressure transmitters are calibrated in a vertical position with the pressure connection down. If this position is changed on installation there can be slight deviations in the zero point for pressure ranges $P_N \leq 1$ bar.
[8] This directive is only valid for devices with maximum permissible overpressure > 200 bar

Wiring diagrams

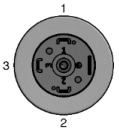
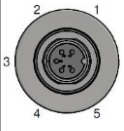
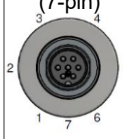
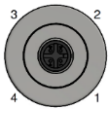
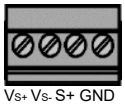
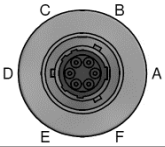
2-wire-system (current)



3-wire-system (voltage)



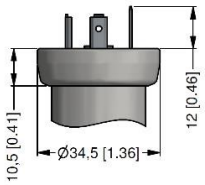
Pin configuration

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)
					 Vs+ Vs- S+ GND			
						2-wire	2-wire	
supply +	1	3	3	1	Vs +	A	A	wh (white)
supply –	2	4	1	2	Vs –	B	D	bn (brown)
signal + (only for 3-wire)	3	1	6	3	S +	-	B	gn (green)
shield	ground pin	5	2	4	GND	pressure port		gn/ye (green/yellow)
Communication interface [9] RxD	-	-	4	-	-	-	-	-
TxD	-	-	5	-	-	-	-	-
GND	-	-	7	-	-	-	-	-

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

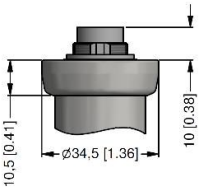
Electrical connections (dimensions in mm)

standard

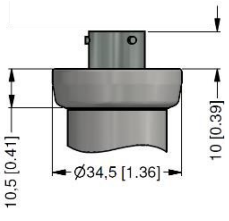


ISO 4400
(IP 65)

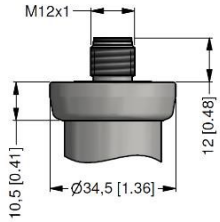
option



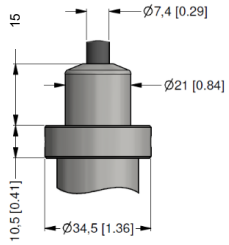
Binder Series 723 5-pin
(IP 67)



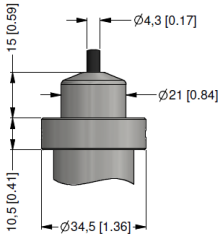
Binder Series 723 7-pin
(IP 67)



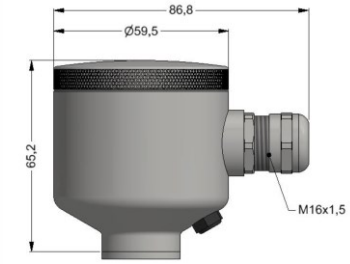
M12x1 4-pin
(IP 67)



cable outlet with ventilation tube
(IP 68) [10]



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

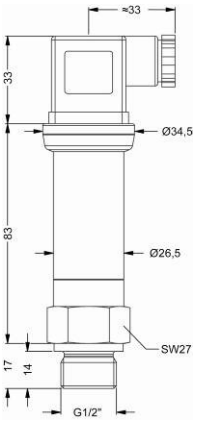


field housing
(IP 67)

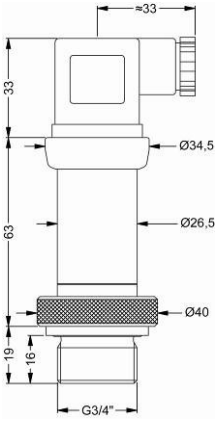
[10] different cable types and lengths available, permissible temperature depends on kind of cable
[11] standard: 2 m PVC cable (without ventilation tube, permissible temperature: -5 ... 70 °C)

Mechanical connection (dimensions in mm)

standard **DMP 331 i / DMP 333 i *** **LMP 331 i**



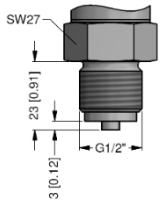
G1/2" DIN 3852



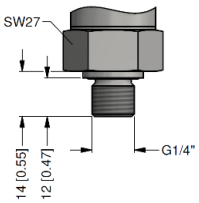
G3/4" DIN 3852

*** for nominal pressure P_N > 400 bar increases the length of DMP 333i without IS-version by 19 mm and of DMP 333i with IS-version by 39 mm**

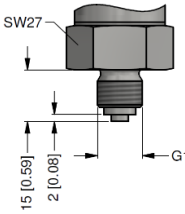
option for DMP 331 i and DMP 333 i



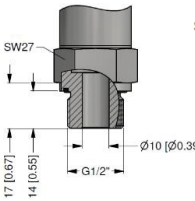
G1/2" EN 837



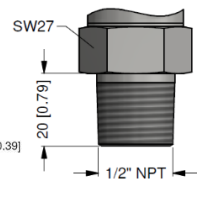
G1/4" DIN 3852



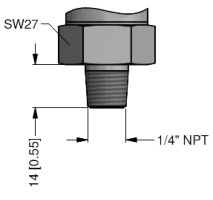
G1/4" EN 837



G1/2" open port



1/2" NPT



1/4" NPT

⇨ **metric threads and others on request**

Windows® is a registered trade mark of Microsoft Corporation

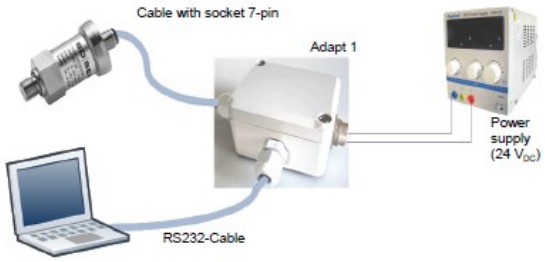
Tel.: +420 572 411 011
www.bdsensors.cz
info@bdsensors.cz

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		

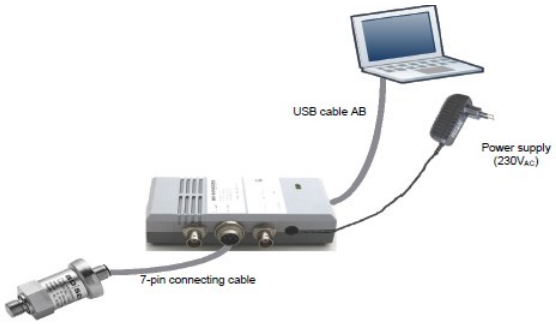
Please read the operating manual carefully before installing and starting up the programming kit.

Wiring diagrams

CIS 510-RS232:



CIS 510-USB interface:



Ordering codes

Version:	**Ordering code:**
Adapt 1 with RS232 connecting cable for PC	**CIS 510-RS232**
Adapt 5 with USB connecting cable for PC	**CIS 510-USB**

Windows® is a registered trade mark of Microsoft Corporation

Ordering code DMP 331i

23.08.2024

DMP 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															
Intrinsic safety Ex ia 4…20 mA / 2-wire								E															
Intrinsic safety M1 Ex ia 4…20 mA / 2-wire (for mines)								F															
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) with Calibration Certificate									Q														
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) [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								
G 1/2" DIN 3852 with flush sensor diaphragm [2]													F	0	0								
M 20 x 1,5 DIN 3852 with flush sensor diaphragm													F	0	4								
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	3				
Viton (FKM) up to -40 °C	F				
Customer	9				
Special version					
Standard		1	1	1	
Temperature compesation -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 for set up on site					
Communication module ADAPT-6 (RS 232 / USB for DMP 331i, DMP 333i) + software					
Software for DMP 331i, 333i / update code 503498					
Accessories					
Adapt 1 with RS232 connecting cable for PC (CIS 510-RS232)					
Adapt 5 with USB connecting cable for PC (CIS 510-USB)					

0,-…without additional charge
On request...in accordance with the producer

Surcharges for calibration are not subject to any discounts. Subject to change.
This document contains the specification for ordering the product; detailed technical parameters of the product and its possible variants are given in the data sheet.
BD SENSORS reserves the right to change sensor specifications without further notice.

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 DMP 331i and $P_N \leq 40$ bar
3 welded version only with pressure ports according to EN 837
4 Communication interface RS232 only possible with el. connection Binder serie 723/423 (7pin)
Software, Interface and cable for DMP 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 registrated trademark of Microsoft Corporation

Ordering code DMP 333i

23.08.2024

DMP 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 9
Output	
4…20 mA / 2-wire	1
Intrinsic safety Ex ia 4…20 mA /2-wire	E
Intrinsic safety M1 Ex ia 4 … 20 mA / 2-wire (for mines)	F
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 (P_N < 160 bar)	3
NBR (standard)	5
Customer	9
Special version	
Standard	1 1 1
Interface RS 232 (only for connector Binder 723/423 7-pin)[4]	1 2 1
Customer	9 9 9
Software for the intelligent pressure transmitters	
Communication module ADAPT-6 (RS 232 / USB for DMP 331i, DMP 333i) + software	
Software for DMP 331i, 333i / update code 503498	
Accessories	
Adapt 1 with RS232 connecting cable for PC (CIS 510-RS232)	

Adapt 5 with USB connecting cable for PC (CIS 510-USB)

0,-…without additional charge
On request...in accordance with the producer
Surcharges for calibration are not subject to any discounts. Subject to change.
This document contains the specification for ordering the product; detailed technical parameters of the product and its possible variants are given in the data sheet.
BD SENSORS reserves the right to change sensor specifications without further notice.

1 measurement starts with ambient pressure

2 pressure ranges > 60 bar as DMP 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 RS232 only possible with el. connection Binder serie 723/423 (7pin)

Software, Interface and cable for DMP 333i 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)

Ordering code LMP 331i

23.08.2024

LMP 331i ☐☐☐ - ☐☐☐☐ - ☐ - ☐ - ☐ - ☐ - ☐☐☐ - ☐☐☐ - ☐ - ☐☐☐

Pressure			
in bar			4 3 0
in m H_2O			4 3 1
Input	**[mH_2O]**	**[bar]**	
	0 … 4	0 … 0,4	4 0 0 0
	0 … 10	0 … 1	1 0 0 1
	0 … 20	0 … 2	2 0 0 1
	0 … 40	0 … 4	4 0 0 1
	0 … 100	0 … 10	1 0 0 2
	0 … 200	0 … 20	2 0 0 2
	0 … 400	0 … 40	4 0 0 2
Customer			9 9 9 9
Housing material			
Stainless steel 1.4404 (316 L)			1
Diaphragm material			
Stainless steel 1.4435 (316 L)			1
Output			
4 … 20 mA / 2-wire			1
0 … 10 V / 3-wire [3]			3
Intrinsic safety Ex ia 4 … 20 mA / 2-wire			E
Intrinsic safety M1 Ex ia 4 … 20 mA / 2-wire (for mines)			F
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 ISO 4400 (IP 65) + silicone seals for Ex nA			1 0 5
Connector Binder Serie 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 DIN 43650 (ISO 4400) - potting compound inside (IP 67)			E 0 0
Connector Binder 723 and 423 7-pin (IP 67) (for Interface RS 232)			A 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)[1] [1]			T R 0
+ PVC cable / 1 m			
Customer			9 9 9
Mechanical connection			
G 3/4" DIN 3852			K 0 0
Customer			9 9 9
Seals			
Viton (FKM)			1
EPDM			3
Customer			9
Special version			
Standard			1 1 1
Interface RS 232 (only for connector Binder Serie 723/423 7-pin)[2]			1 2 1
Customer			9 9 9
Accessories			
Adapt 1 with RS232 connecting cable for PC (CIS 510-RS232)			
Adapt 5 with USB connecting cable for PC (CIS 510-USB)			

0,-…without additional charge   On request...in accordance with the producer

Surcharges for calibration are not subject to any discounts. Subject to change.
This document contains the specification for ordering the product; detailed technical parameters of the product and its possible variants are given in

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

2 not in combination with SIL

3 maximum length of PVC cable – 25 m, PUR, FEP, TPE – 40 m