



# DMK 331P

## Industrial Pressure Transmitter

### Pressure Ports With Flush Welded Stainless Steel Diaphragm

accuracy according to IEC 60770:  
0.5 % FSO

DMK 331P  
Industrial  
Pressure Transmitter

#### **Nominal pressure**

from 0 ... 60 bar  
up to 0 ... 400 bar

#### **Output signals**

2-wire: 4 ... 20 mA  
3-wire: 0 ... 20 mA / 0 ... 10 V  
others on request

#### **Special characteristics**

- ▶ suited for viscous and pasty media

#### **Optional versions**

- ▶ IS-version  
Ex ia = intrinsically safe for gases and dusts
- ▶ SIL 2  
according to IEC 61508 / IEC 61511
- ▶ food compatible oil filling with FDA approval
- ▶ cooling element for media temperatures up to 300 °C
- ▶ customer specific versions



The pressure transmitter DMK 331P is suitable for measuring the pressure of viscous and pasty media, where a totally flush pressure port is required.

As on all industrial pressure transmitters made by BD|SENSORS, you may choose between various electrical and mechanical connections also on DMK 331P.

#### **Preferred areas of use are**



Plant and Machine Engineering



Food Industry

#### **Preferred used for**



Viscous and Pasty Media

Input pressure range						
Nominal pressure gauge / abs.	[bar]	60	100	160	250	400
Overpressure	[bar]	100	200	400	400	600
Burst pressure $\geq$	[bar]	120	250	500	500	650
Output signal / Supply						
Standard	2-wire:	4 ... 20 mA / $V_s = 8 \dots 32 V_{DC}$				
Option IS-protection	2-wire:	4 ... 20 mA / $V_s = 10 \dots 28 V_{DC}$				
Options 3-wire	3-wire:	0 ... 20 mA / $V_s = 14 \dots 30 V_{DC}$				
		0 ... 10 V / $V_s = 14 \dots 30 V_{DC}$				
Performance						
Accuracy <sup>1</sup>		$\leq \pm 0.5 \% \text{ FSO}$				
Permissible load	current 2-wire:	$R_{max} = [(V_s - V_{s \text{ min}}) / 0.02] \Omega$				
	current 3-wire:	$R_{max} = 500 \Omega$				
	voltage 3-wire:	$R_{min} = 10 \text{ k}\Omega$				
Influence effects	supply:	0.05 % FSO / 10 V				
	load:	0.05 % FSO / k $\Omega$				
Long term stability		$\leq \pm 0.3 \% \text{ FSO} / \text{year}$ at reference conditions				
Response time	2-wire:	$\leq 10 \text{ msec}$				
	3-wire:	$\leq 3 \text{ msec}$				
<sup>1</sup> accuracy according to IEC 60770 – limit point adjustment (non-linearity, hysteresis, repeatability)						
Thermal effects (Offset and Span) <sup>2</sup> / Permissible temperatures						
Thermal error		$\leq \pm 0.2 \% \text{ FSO} / 10 \text{ K}$				
in compensated range		-20 ... 85°C				
Permissible temperatures <sup>3</sup>	medium:	-40 ... 125 °C for filling fluid silicon oil				
		-10 ... 125 °C for filling fluid food compatible oil				
	electronics / environment:	-40 ... 85 °C				
storage:		-40 ... 100 °C				
	Permissible temperature medium for cooling element 300°C	filling fluid silicon oil	overpressure: -40 ... 300 °C	vacuum: -40 ... 150 °C		
	filling fluid food compatible oil	overpressure: -10 ... 250 °C	vacuum: -10 ... 150 °C			
<sup>2</sup> an optional cooling element can influence thermal effects for offset and span depending on installation position and filling conditions.						
<sup>3</sup> max. temperature of the medium for overpressure > 0 bar: 150 °C for 60 minutes with a max. environmental temperature of 50 °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				
Mechanical stability						
Vibration		20 g RMS (25 ... 2000 Hz)	according to DIN EN 60068-2-6			
Shock		500 g / 1 msec	according to DIN EN 60068-2-27			
Filling fluids						
Standard		silicon oil				
Options		food compatible oil (with FDA approval) (Mobil DTE FM 32; Category Code: H1; NSF Registration No.: 130662) others on request				
Materials						
Pressure port		stainless steel 1.4404 (316 L)				
Housing		stainless steel 1.4404 (316 L)				
Option compact field housing		stainless steel 1.4305 (303) with cable gland brass, nickel plated	others on request			
Seals (media wetted)	standard:	FKM (recommended for medium temperatures $\leq 200 \text{ }^\circ\text{C}$ )				
	option:	FFKM (recommended for medium temperatures $> 200 \text{ }^\circ\text{C}$ )				
		others on request				
Diaphragm		stainless steel 1.4435 (316 L)				
Media wetted parts		pressure port, seals, diaphragm				
Explosion protection (only for 4 ... 20 mA / 2-wire)						
Approval DX 19 - DMK 331P	IBExU 10 ATEX 1068 X					
	zone 0:	II 1G Ex ia IIC T4 Ga				
	zone 20:	II 1D Ex ta IIIC T 85°C, IP6x <b>in preparation</b>				
Safety technical maximum values		$U_i = 28 \text{ V}$ , $I_i = 93 \text{ mA}$ , $P_i = 660 \text{ mW}$ , $C_i \approx 0 \text{ nF}$ , $L_i \approx 0 \text{ }\mu\text{H}$				
Permissible temperatures for environment	in zone 0:	-20 ... 60 °C with $p_{atm}$ 0.8 bar up to 1.1 bar				
	in zone 1 or higher:	-20 ... 70 °C				
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: 1 $\mu\text{H}/\text{m}$				

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Industrial Pressure Transmitter

Technical Data

Miscellaneous					
Option SIL 2	according to IEC 61508 / IEC 61511				
Current consumption	signal output current: max. 25 mA signal output voltage: max. 5 mA				
Weight	min. 200 g (depending on process connection)				
Installation position	any (standard calibration in a vertical position with the pressure port connection down)				
Operational life	> 100 x 10 <sup>6</sup> pressure cycles				
CE-conformity	EMC Directive: 2004/108/EC		Pressure Equipment Directive: 97/23/EC (module A) <sup>4</sup>		
<sup>4</sup> This directive is only valid for devices with maximum permissible overpressure > 200 bar					
Wiring diagrams					
<b>2-wire-system (current)</b> 			<b>3-wire-system (current / voltage)</b> 		
Pin configuration					
Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	field housing	cable colours (DIN 47100)
Supply +	1	3	1	IN +	wh (white)
Supply -	2	4	2	IN -	bn (brown)
Signal + (only for 3-wire)	3	1	3	OUT +	gn (green)
Shield	ground pin	5	4	⊥	gn/ye (green / yellow)
Electrical connection (dimensions in mm)					
<b>standard</b>  ISO 4400 (IP 65)		<b>option</b>  Binder Series 723 5-pin (IP 67)		 M12x1 4-pin (IP 67)	
 compact field housing (IP 67)			 cable outlet with PVC cable (IP 67) <sup>5</sup>		
⇒ universal field housing stainless steel 1.4404 (316 L) with cable gland M20x1.5 (ordering code 880) and other versions on request					
<sup>5</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C)					



**Ordering code DMK 331P**

**DMK 331P**

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<b>Pressure</b>										
gauge	5	0	5							
absolute	5	0	6							
<b>Input [bar]</b>										
60	6	0	0	2						
100	1	0	0	3						
160	1	6	0	3						
250	2	5	0	3						
400	4	0	0	3						
customer	9	9	9	9						consult
<b>Output</b>										
4 ... 20 mA / 2-wire									1	
0 ... 20 mA / 3-wire									2	
0 ... 10 V / 3-wire									3	
Intrinsic safety 4 ... 20 mA / 2-wire									E	
SIL2 4 ... 20 mA / 2-wire									1S	
SIL2 with Intrinsic safety 4 ... 20 mA / 2-wire									ES	
customer									9	consult
<b>Accuracy</b>										
0.5 %									5	
customer									9	consult
<b>Electrical connection</b>										
Male and female plug ISO 4400									1	0
Male plug Binder series 723 (5-pin)									2	0
Cable outlet with PVC-cable <sup>1</sup>									T	A
Male plug M12x1 (4-pin) / metal									M	1
compact field housing									8	5
stainless steel 1.4305										0
customer									9	9
<b>Mechanical connection</b>										
G1/2" DIN 3852 with flush diaphragm									Z	0
G3/4" DIN 3852 with flush diaphragm									Z	3
G1" DIN 3852 with flush diaphragm									Z	3
G1" DIN 3852 with rad. o-ring and flush diaphragm									Z	5
G 1/2" DIN 3852 with rad. o-ring and flush diaphragm									Z	6
customer									9	9
<b>Diaphragm</b>										
Stainless steel 1.4435 (316L)									1	
customer									9	consult
<b>Seals</b>										
FKM									1	
FFKM <sup>2</sup>									7	
customer									9	consult
<b>Filling Fluids</b>										
Silicon oil									1	
food compatible oil									2	
customer									9	consult
<b>Special version</b>										
standard									0	0
with cooling element up to 300°C									2	0
customer									9	9

<sup>1</sup> standard: 2 m PVC cable without ventilation tube (permissible temperature: -5 ... 70°C)

<sup>2</sup> only for pressure ≤ 160 bar

