



## Pressure Transmitter DK 331 P

Ceramic sensor. Flush pressure transmitter with welded stainless steel membrane



D-EN-DK331P\_20200318

- Long-term stable
- Good linearity
- Customized designs
- For viscous and pasty media



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### Features

- nominal pressure: 0 ... 60 bar up to 0 ... 400 bar
- accuracy: 0.5 % FSO
- suited for viscous and pasty media

### Optional features

- S-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

### Applications

- Process engineering
- Chemical industry
- Food industry
- Paper industry

### Operating principle

The DK 331 P is a pressure transmitter for process measurement technology. Because of its flush stainless steel membrane, the DK 331 P is suitable for viscous media and gases that are compatible with stainless steel 1.4435 and the sealing material.

The basic element of the DK 331 P is a ceramic sensor, which is characterized by a low temperature error, good linearity and long-term stability. In addition to silicone oil, food-grade oil and halocarbon, other filler oils are available as pressure transmission fluids on request.

A temperature decoupler is optionally available for use at higher media temperatures. Different output signals and electrical connection variants ensure that almost every application that occurs in practice is covered. The DK 331 P can be used in potentially explosive areas.



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Input variable <sup>1</sup>															
Nominal pressure rel. <sup>1</sup> [bar]	-1...0	1	1,6	2,5	4	6	10	16	25	40	60	100	160	250	400
Nominal pressure abs. <sup>2</sup> [bar]	-	1	1,6	2,5	4	6	10	16	25	40	60	100	160	250	400
Max. overpressure [bar]	3	3	7	7	12	12	25	50	50	120	120	250	500	500	600

Output signal / Auxiliary energy	
Standard	2-wire: 4 ... 20 mA/ $U_B = 12 \dots 36 V_{DC}$ Ex-version: $U_B = 14 \dots 28 V_{DC}$
Options	3-wire: 0 ... 20 mA/ $U_B = 14 \dots 36 V_{DC}$ 0 ... 10 V/ $U_B = 14 \dots 36 V_{DC}$

Performance		Temperature effects (Offset and span) <sup>4</sup>	
Accuracy <sup>3</sup>	$\leq \pm 0,5 \% \text{ FSO}$	Thermal error	$\leq \pm 0,2 \% \text{ FSO} / 10 \text{ K}$
Permissible load	current 2-wire: $R_{\max} = [(U_B - U_{B \min}) / 0,02] \text{ W}$ current 3-wire: $R_{\max} = 500 \text{ W}$ voltage 3-wire: $R_{\min} = 10 \text{ kW}$	In compensated range	-25 ... 85 °C
Influencing effects	Supply: 0,05 % FSO / 10 V Load: 0,05 % FSO / kW		
Response time	< 10 ms		

Electrical protection	
Short-circuit protection	permanent
Reverse polarity protection	No damage, but also no function
Electromagnetic compatibility	Emission and immunity according to EN 61326
Option Ex protection Only for 4 ... 20 mA / 2-wire DX13-DK 331 P	Zone 0 : II 1 G EEx ia IIC T4 Zone 20: II 1 D T 85°C Safety-related maximum values: $U_i = 28 \text{ V}$ , $I_i = 93 \text{ mA}$ , $P_i = 660 \text{ mW}$ , $C_i \leq 1 \text{ nF}$ , $L_i \leq 10 \text{ }\mu\text{H}$

Mechanical stability	
Vibration	10 g RMS (20 ... 2000 Hz)
Shock	100 g / 11 ms

Temperature ranges	
Medium	-25 ... 135 °C <sup>2, 6</sup>
Electronics / ambience	-25 ... 85 °C      Ex version: Use as Zone 0 equipment: -20 ... 60 °C Use as Zone 1 equipment: -25 ... 70 °C
Storage	-40 ... 100 °C

- 1) Pressure ranges PN <1.6 bar not possible with mechanical connection G1 / 2 "flush
- 2) With vacuum and absolute pressure ranges, the medium temperature is limited to 70 °C
- 3) Characteristic curve deviation according to IEC 60770 - limit point setting (non-linearity, hysteresis, reproducibility)
- 4) Depending on the installation and filling conditions, an optional temperature decoupler can influence the temperature error for offset and span.
- 5) approved for atmospheric pressure from 0.8 bar to 1.1 bar
- 6) with an optional temperature decoupler, the maximum permissible temperature<sup>4</sup> applies

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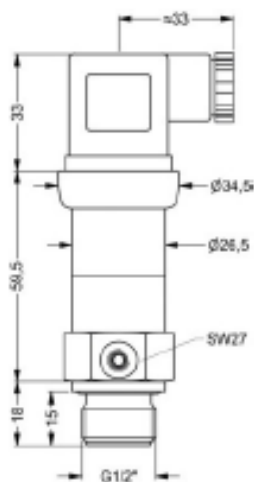


## Pressure Transmitter DK 331 P

Ceramic sensor. Flush pressure transmitter with welded stainless steel membrane

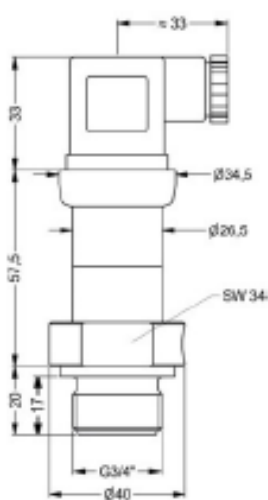
### Mechanical connections (in mm)

standard

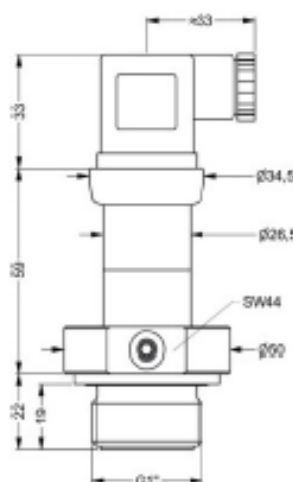


G1/2" flush DIN 3852

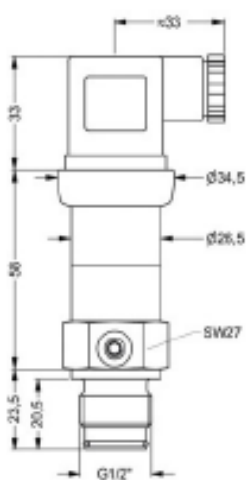
options



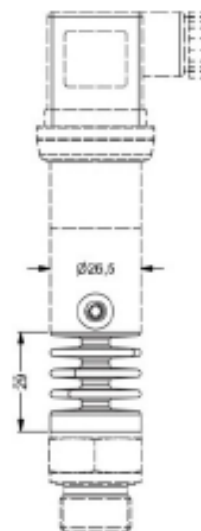
G3/4" flush DIN 3852



G1" flush DIN 3852



G1/2" flush with radial o-ring



cooling element 300 °C<sup>3</sup>

- SIL- and SIL-Ex version: total length increases by 26.5 mm!
- metric threads and other versions on request

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Filling fluids	
Standard	Silicone oil
Options	food compatible oil (with FDA approval) (Mobil SHC Cibus 32; Category Code: H1; NSF Registration No.: 141500) others on request
Material	
Pressure port	Stainless steel 1.4435 (316L)
Housing	Stainless steel 1.4404 (316L) Option compact field housing: stainless steel 1.4301 (304); cable gland M12x1.5, brass, nickel plated (clamping range 2 ... 8 mm)
Seals	standard: FKM (recommended for medium temperatures $\leq 200$ °C) option: FFKM <sup>4</sup> (recommended for medium temperatures $> 200$ °C) others on request
Diaphragm	Stainless steel 1.4435 (316L)
Media wetted parts	Pressure port, seals, diaphragm
4 for pressure ranges $P_N \leq 100$ bar	
Explosion protection (only for 4 ... 20 mA / 2-wire)	
Approvals DX19-DK 331P	IBExU 10 ATEX 1068 X / IECEx IBE 12.0027X zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T 85°C Da
Safety technical maximum values	$U_i = 28$ V, $I_i = 93$ mA, $P_i = 660$ mW, $C_i \approx 0$ nF, $L_i \approx 0$ $\mu$ H, the supply connections have an inner capacity of max. 27 nF to the housing
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 $\mu$ H/m

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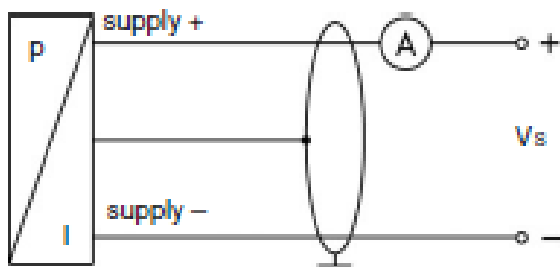
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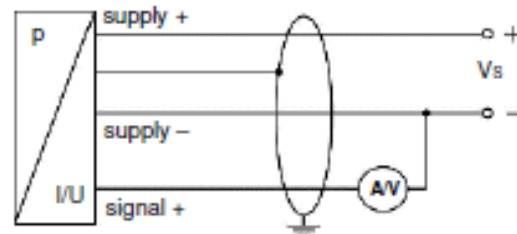
Pin configuration					
Electrical connection	ISO 4400	Binder 723 (5-pin)	M12x1 / metal (4-pin)	Field housing	Cable color (IEC 60757)
Supply + Supply - Signal + (only for 3-wire)	1 2 3	3 4 1	1 2 3	IN+ IN- OUT+	WH (white) BN (brown) GN (green)
Shielde	Ground pin	5	4		GNYE (green-yellow)

### Wiring diagrams

2-wire-system (current)



3-wire-system (current / voltage)



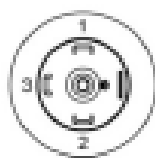
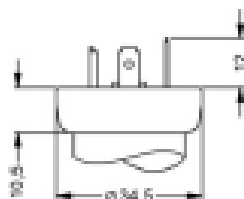


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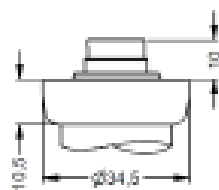
### Electrical connections (in mm)

#### standard

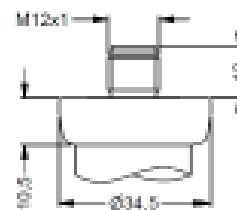


ISO 4400  
(IP 65)

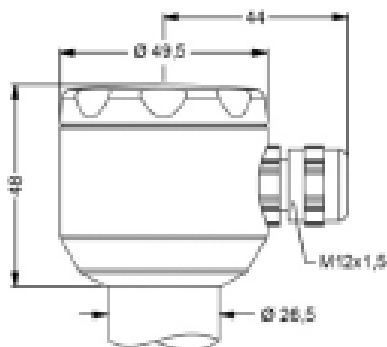
#### options



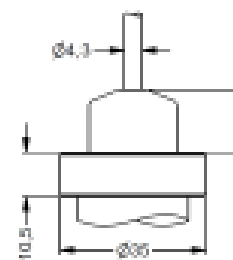
Binder Series 723 5-pin  
(IP 67)



M12x1 4-pin  
(IP 67)



compact field housing  
(IP 67)



cable outlet with PVC cable  
(IP 67) †

universal field housing stainless steel 1.4404 (316 L) with cable gland M20x1.5 (ordering code 880) and other versions on request

#### Important instructions!

Technical changes and errors reserved.

Pictures can be similar.

The operating instructions belonging to this device must be observed! Download at [www.schmidt-messtechnik.com](http://www.schmidt-messtechnik.com).