



# IMP 331i

Precision Screw-in Transmitter

Stainless Steel Sensor

accuracy according to IEC 60770: 0.1 % FSO

#### Nominal pressure

from 0 ... 400 mbar up to 0 ... 40 bar

#### **Output signal**

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

### **Product characteristics**

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

#### **Optional versions**

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

The precision screw-in transmitter IMP 331i demonstrate the further development of our industrial pressure transmitters.

The signal processing of sensor signal is done by digital electronics with 16-bit analogue digital converter. Consequently, it is possible to conduct an active compensation and the transmitters with excellent measurements and exceptionally attractive price to offer on the market.

## Preferred areas of use are



Chemical / petrochemical industry



Environmental engineering (water / sewage / recycling)



Pressure ranges <sup>1</sup>									
Nominal pressure gauge	[bar]	0.4	1	2	4	10	20	40	
Level gauge [ml	$H_2O$	4	10	20	40	100	200	400	
Overpressure	[bar]	2	5	10	20	40	80	105	
Burst pressure	[bar]	3	7.5	15	25	50	120	210	
<sup>1</sup> On customer request we adjust the	<sup>1</sup> On customer request we adjust the device within the turn-down-possibility by software on the required pressure range.								
Output signal / Supply		1							
Standard	2-wire: 4 20 mA / $V_s = 12 36 V_{DC}$								
Option IS-version		2-wire: 4 20 mA / $V_s = 14 28 V_{DC}$							
Options analogue signal		2-wire: 420 mA with communication interface $^{2}$							
		3-wire: $0 \dots 10 \text{ V}$ / $V_{\text{S}} = 14 \dots 36 \text{ V}_{\text{DC}}$							
<sup>2</sup> only possible with electrical conne	ection	Binder series 72	3 (7-pin)	minumeation	literrace				
Performance	Parformance								
Accuracy		IEC 60770 3.	≤ + 0.1 % FS0	<u>ר</u>					
performance after turn-down				-					
- TD $\leq$ 1:5		no change of	accuracy 4						
- TD > 1:5		for calculation	n use the follow	wing formula (	for nominal p	ressure ranges	≤ 0.40 bar see i	note 4):	
		≤ ± [0.1 + 0.0	15 x turn-dow	n] % FSO		<u> </u>		,	
		with turn-dow	n = nominal p	ressure range	/ adjusted rai	nge			
	e.g. with a turn-down of 1:10 following accuracy is calculated:								
		$\leq \pm (0.1 + 0.0)$	15 x 10) % FS	SO i.e. accura	icy is $\leq \pm 0.25$	% FSO			
Permissible load		current 2-wire	$R_{max} = [(V_s)$	– V <sub>s</sub> min) / 0.	02 A] Ω				
Influence offecto		voltage 3-wire	$R_{min} = 10 K$	$\Omega$					
milluence enecis	Ince effects Supply: 0.05 % FSO / 10 V								
Long term stability		$\leq \pm (0.1 \text{ x turn-down}) \% \text{ FSO / vear at reference conditions}$							
Response time	ponse time approx. 5 msec								
Adjustability (with option		configuration of following parameters possible (interface / software necessary <sup>5</sup> ):							
communication interface RS23	32)	- electronic damping: 0 100 sec							
	- OTISET: U 90 % FSU								
- tutti duwiti ui spati. max. i. tu									
<sup>4</sup> except nominal pressure ranges	≤ 0.40	bar; for these ca	lculation of accu	iracy is as follow	vs:				
$\leq \pm (0.1 + 0.02 \text{ x turn-down}) \% FS$	SO e.g.	. turn-down of 1:	$3! \le \pm (0.1 \pm 0.0)$	2 x 3 ) % FSO i.	e. accuracy is ≤	± 0.16 % FSO	on 10 or higher o	nd VD)	
* sonware, interface, and cable have to be ordered separately (software appropriate for Windows® 95, 98, 2000, NT version 4.0 or higher, and XP)									
Telerance band		$< \pm (0.2 \times tur)$		in compone	atod rango	20 80 °C			
TC average [% ESO / 1	10 KJ	$= \pm (0.2 \times turn)$	i-down)	in compens	ated range	-20 80 °C			
Permissible temperatures		medium:	l'downy	-25 125 °	C	20 00 0			
		electronics /	environment:	-25 85 °C	;				
		storage:		-40 100 °	С				
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	Materials								
Pressure port		stainless steel 1.4404 (316 L)							
Housing		stainless steel 1.4404 (316 L)							
Option compact field housing		stainless stee	el 1.4301 (304 /12x1 5 brock	) s nickel platov	t (clamping ro	nge 2 8 mm			
Seals		FKM	112A1.J, DIdS	others on re	auest	inge ∠ o min	<u>,</u>		
Diaphragm		stainless stee	el 1.4435 (316	L)					
Media wetted parts	Media wetted parts pressure port, seals, diaphragm								
Mechanical stability									
Vibration		10 a RMS (2	0 2000 Hz)	according to	DIN EN 600	68-2-6			
Shock		100 g / 11 ms	sec.	according to	DIN EN 600	68-2-27			

Approvals DX19-IMP 331i 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 T135 °C Da						
zone 0: II 1G Ex ia IIC T4 Ga zone 20: II 1D Ex ia IIIC T135 °C Da						
zone 20: II 1D Ex ia IIIC T135 °C Da						
Safety technical max. values $U_i = 28 \text{ V}, I_i = 93 \text{ mA}, P_i = 660 \text{ mW}, C_i \approx 0 \text{ nF}, L_i \approx 0 \mu\text{H},$						
the supply connections have an inner capacity of max. 27 nF to the housing						
Permissible temperatures for in zone 0: -20 60 °C with p <sub>atm</sub> 0.8 bar up to 1.1 bar						
environment in zone 1 or higher: -40/-20 65 °C						
Connecting cables cable capacitance: signal line/shield also signal line/signal line: 160 pF/m						
(by factory) cable inductance: signal line/shield also signal line/signal line: 1 μH/m						
Miscellaneous						
Current consumption signal output current: max. 25 mA						
signal output voltage: max. 7 mA						
Weight approx. 200 g						
Installation position any <sup>6</sup>						
Operational life 100 million load cycles						
CE-conformity EMC Directive: 2014/30/EU						
ATEX Directive 2014/34/EU						
<sup>6</sup> 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 $p_N \le 1$ bar.						
Wiring diagrams						
2-wire-system (current) 3-wire-system (voltage)						
$ \begin{array}{c c} p & supply + & & & & & \\ \hline & & & & & \\ \hline & & & & & \\ \hline & & & &$						
Pin configuration						

Electrical connections	ISO 4400	Binder 723 (5-pin)	Binder 723/423 (7-pin)	M12x1/ metal (4-pin)	compact 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 +	GN (green)		
shield	ground pin 🕀	5	2	4	٢	GNYE (green-yellow)		
Communication inter- RxD	-	-	4	-	-	-		
face <sup>7</sup> TxD	-	-	5	-	-	-		
GND	-	-	7	-	-	-		

<sup>7</sup> may not be transmitted directly with the PC (the suitable adapter is available as accessory)



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Ordering code IMP 331i						
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Pressure						
in bar in mH₂O	4 3 0					
Input [mH <sub>2</sub> O] [bar]						
4 0.4	4 0 0 0					
10 1.0	1 0 0 1					
20 2.0	2 0 0 1					
40 4.0	4 0 0 1					
100 10	1 0 0 2					
200 20	2 0 0 2					
400 40	4 0 0 2					
customer	9 9 9 9					consult
Output						
4 20 mA / 2-wire		1				
intrinsic safety 4 20 mA / 2-wire		E				
0 10 V / 3-wire		3				
customer		9				consult
Accuracy (at nominal pressure)						
0.1 % FSO		1				
customer		9				consult
Electrical connection						
male and female plug ISO 4400		1	0 0			
male plug Binder series 723 (5-pin)		2	0 0			
male plug Binder series 723 (7-pin)		A	0 0			
and female plug Binder series 423 (7-pin)						
male plug M12x1 (4-pln) / metal		M	1 0			
Tor analog output						
for digital output		M	1 3			
coble outlet with DVC coble (ID67) 1		т	A 0			
cable outlet with FVC cable (IFOT)		1	AU			
cable with ventilation tube (ID68) 2		Т	R 0			
compact field housing						
stainless steel 1 /301 (30/)		8	5 0			
customer		q	9 9			consult
Mechanical connection		5	5 5			Consult
G3/4" DIN 3852						
with flush sensor			K 0 0			
customer			9 9 9			consult
Seal						
FKM			1			
customer			ç			consult
Special version						
standard				1	1 1	
communication interface RS232 <sup>3</sup>				1	2 1	
customer				9	9 9	consult

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

<sup>2</sup> code TR0 = PVC cable, cable with ventilation tabe (permissible temperature, 5 ... 70 G), duels of receiver and lengths
 <sup>3</sup> communication interface RS232 only possible with electrical connection Binder serie 723/423 (7-pin)

software, interface and cable for IMP 331i with option RS232 have to be order separately (ordering code: CIS-G; software appropriate for Windows<sup>®</sup> 95, 98, 2000, NT version 4.0 or newer and XP)

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